Holt Mathematics

CRCT Prep Workbook

for Grade 7

HOLT, RINEHART AND WINSTON
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To the Student

This book is designed to help you practice for the CRCT in Mathematics. The book contains practice questions arranged by topic, and practice tests.

The practice questions by topic are organized by content strands. There are five strands:

- Numbers and Operations
- Measurement
- Geometry
- Algebra
- Data Analysis and Probability

Within each strand, there are several 3-page worksheets on each topic. Each question, like the state test, is multiple choice.

At the back of the book, the practice tests contain mixed practice on all strands. The questions are also in multiple-choice format.

When you take the CRCT, you will have a maximum of 70 minutes to complete each section. This is an average of about 2 minutes per question. It is a good idea to time yourself as you work some of the practice questions in order to get used to working in a timed situation.

In addition to the practice in this book, your textbook has many opportunities to practice questions in the format of the CRCT, as well as practice tests and test-taking strategies.

Standardized Test-Taking Strategies for Math

Test Practice

Numbers and Operations

Geometry

Algebra

Data and Probability

CRCT in Brief	
Question format	**Multiple choice**
Number of questions	The test will contain: • 50 reading questions • 60 English/Language Arts questions • **70 Mathematics questions** • 70 Science questions • 70 Social Studies questions
Time allowed	The test will be administered over five days, and you will be tested on one subject per day. There will be two sections per subject that each take approximately 45–60 minutes, with about a 10-minute break between sections.
Materials needed	Bring two sharpened No. 2 pencils with erasers. Scratch paper will be provided. No calculators are allowed during any portion of the test.
Links	www.doe.k12.ga.us www.georgiastandards.org

Standardized Test-Taking Strategies for Math

Standardized tests, such as the CRCT, are designed in order for you to demonstrate the content and skills you have learned. It is important to keep in mind that, in most cases, the best way to prepare for these tests is to pay close attention in class and take every opportunity to improve your mathematical, reading, and writing skills.

Tips For Taking The Test

Throughout the year

– Keep up with your homework. Homework is important practice that will help you learn the skills you need for the test. Practice will also help you answer questions more quickly, leaving more time for the difficult questions.

– Review your notes, homework, and tests on a regular basis to make sure that you maintain the skills you learned earlier in the year.

– Use flashcards to learn important formulas and vocabulary words. If you can, memorize formulas to save time on the test.

– Familiarize yourself with the format and content of the test.

– Make a timeline for reviewing materials in the time leading up to the test. Do not try to “cram” the night before the test.

– Practice without your calculator, because you will not be allowed to use a calculator on the test.

Before the test

– Be sure you are well rested.

– Eat a good breakfast.

– Be on time, and be sure that you have the necessary materials.

– Be sure to bring any assistive device that you need, such as glasses or a hearing aid.

– Try not to miss class the day before the test. Your teacher may be reviewing important content.

During the Test

– Listen to the instructions of the teacher. It's easy to miss important points that can affect your score.

– Read the directions carefully. If you do not understand a direction, raise your hand and ask for clarification immediately.

– Use your scratch paper. You are more likely to make a mistake when doing a problem in your head. You can also use your written work to help check your answer. Circle the answer and write the problem number next to your work so you can find it while you are reviewing your test.

– Read the entire question, including all answer choices, and think about your answer before you make any marks on the answer sheet.

– Fill in the circle for each answer carefully and completely. Erase any stray marks on the page. If you change an answer choice, be sure to erase completely and carefully so that you do not tear a hole in the answer sheet.

– Make sure the number on the answer document matches the question number in the test booklet.

– Don't spend too much time on any one question. If you cannot answer a question right away, fill in your best choice. If you have time at the end of the test, return to any questions you are unsure of.

– If questions contain negative wording such as NOT, read them carefully and be alert for the use of double negatives within a sentence.

– Understand the format of the test so that you can gauge your time according to what section of the test you are taking.

– If you finish early, review the test and make sure the answer sheet is filled out correctly. Remember, your first answer is usually the correct one, so don't change an answer unless you can convince yourself that your original choice is wrong. Try solving the problem in a different way to see if you get the same answer.

– DON'T STRESS! Just remember what you have learned in class, and you should do well.

Tips for Answering Multiple-Choice Questions

– If there is a figure accompanying the question, review the figure carefully. Read the labels and make sure you understand what the figure represents. Remember, a figure may not be drawn to scale.

– If there is not a figure, it may be helpful to draw one on your scratch paper using the information provided.

– Read the multiple-choice question first for its general intent and then reread it carefully, looking for words that give clues or can limit possible answers to the question.

– If possible, work the question before looking at the answer choices. Then look for your answer among the given choices. If your answer is not one of the choices, read the question again. Be sure that you understand the problem. Remember, common errors are often used to generate incorrect answer choices. Be sure you work carefully.

– Make sure you answer the question being asked. A partial answer to the question may be used as an incorrect answer choice.

– Always read **all** of the possible answer choices—even if the first one seems like the correct answer. There may be a better choice farther down in the list.

– Think of what you already know about the math topic involved and use that information to help eliminate answer choices. You can also use estimation to eliminate answer choices.

– If you cannot work the question, you may be able to substitute the answer choices back into the question to find the correct choice. Start with the middle value. If the result is too large, then substitute a smaller value. If the result is too small, then substitute a larger value.

– Never leave a question blank. There is no penalty for guessing, so always choose an answer.

– When you are finished, reread the question and the selected answer to be sure that you made the best choice and that you marked it correctly on the answer sheet.

Strategies for Success

There are various strategies you can employ ahead of time to help you feel more confident about answering questions on math standardized tests. Here are a few suggestions:

1. VISUALS

Note the labels on the charts and graphs. For example, a scale on one axis may provide a valuable clue. Read all graphs twice.

When reading diagrams, read all labels and tick marks carefully, and read diagrams twice, also.

Label the figure with any information stated in the problem that is not in the diagram. Use the properties of the figure, for example, if it is stated that a figure is a square, you can label all the sides with the same length.

If a figure is not provided, it may be helpful to draw one. Be sure that you do not assume any information that is not included in the problem. Remember, the figure does not have to look perfect. It is only to help you understand the relationships in the problem.

2. CONCEPTS

When answering questions about math concepts, don't let a hard question stump you. You can always work with what you do know. It's possible to answer a question when you know only a part of the concept being tested.

Another strategy to help you on difficult questions is to draw or sketch out the question's concept. Often you can understand how to answer a question by listing what you know, sketching the process, and then identifying what you are supposed to solve.

If you do not understand a problem on the test, try to relate it to a problem you can solve. For example, you can substitute simpler numbers into a problem and figure out how to solve it. Then try again with the original values in the problem.

3. MATH SKILLS

To help you on the math sections of the tests, practice the skills as you are reading and discussing your textbook. For example, you could put the steps to a process in order in your mind. Also, sequencing a process can become a game you play with a friend who also has to take the test. Always ask yourself what the most important points are when studying sections. Some of the more common skills for studying math are

- **Analyzing Information**—the process of breaking something down into its parts and examining the relationships between them. Analyzing enables you to better understand the whole.

- **Sequencing**—the process of placing the steps in a process in order to better understand the steps and the process as a whole. When you analyze the sequence, you are determining what happens first, second, and so on.

- **Categorizing**—the process by which you group things together by the characteristics they have in common. Categorizing helps you to make comparisons and see differences among things.

- **Identifying Cause and Effect**—interpreting the relationships between events. A *cause* makes something happen. An *effect* is what happens as a result of the cause.

- **Comparing and Contrasting**—the process of examining situations or ideas, etc., for their similarities and differences.

- **Summarizing**—the process of taking a large amount of information and boiling it down into a short clear statement. To *summarize* a problem, you must analyze the problem to find the most important points and the supporting information.

- **Paraphrasing**—a paraphrase is a restatement of someone's ideas or words. A paraphrase is usually about as long as the original; the ideas are just expressed in simpler terms. A paraphrase question might be stated like this, "According to the passage, which of these statements is accurate?"

- **Visualizing**—visualizing helps you see processes and procedures in your mind's eye. Visualizing will help you be successful on a variety of math questions you could encounter on tests.

4. READING MATH

First, remember that what you have learned about math can help you in answering comprehension questions on tests. Also, though, remember the following points:

- Read the problem as if you were not taking a test.
- Look at the big picture. Ask yourself questions like, *What is the question being asked? What do the diagrams or graphs tell me?*
- Read the problem quickly first. This technique will help you know what information to look for as you read.
- Reread the problem and underline information related to the questions.
- Go back to the question and try to answer it in your mind before looking at the answers.
- Read all the answer choices and eliminate the ones that are obviously incorrect.
- If you can eliminate certain answers, getting the choice down to two, go ahead and pick one of the two responses. That's an educated guess, and you are most likely better off making the choice.

Analyzing Word Problems

Many students who are comfortable with basic skill problems are still stumped by word problems. These steps will help you work through word problems on standardized tests.

Step 1 Understand the problem

Read the problem carefully and make sure you understand what is being asked. You may wish to rewrite the question in your own words.

List the given information or circle it in your test booklet, if you are allowed to write in it. Cross out any unnecessary information.

Step 2 Make a plan

Think about similar problems you have seen in the past, and how you solved them.

Determine a strategy or strategies that you will use to solve the problem, such as drawing a diagram, working backward, finding a pattern, or other problem-solving strategies.

Step 3 Solve the problem

Solve the problem according to your plan. If the strategy you chose is not working, go back and revise. Write out all the steps on your scratch paper to avoid making careless mistakes.

Step 4 Look Back

Make sure you answered the question that was asked.

Check your answer in the words of the problem to make sure your answer is reasonable.

Make sure your answer is in the correct place on the answer document.

Learning Math Vocabulary

Learning vocabulary is important in order to be successful on standardized tests. During the test, you will not be able to ask the meaning of a word, and you may not be able to answer a question that contains a word you do not know.

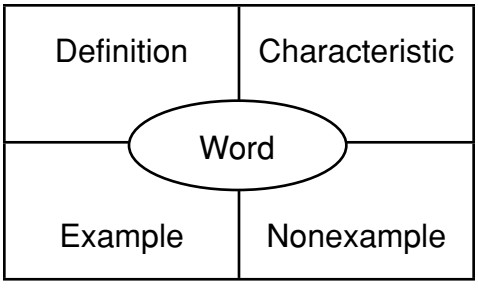
Spend time learning vocabulary throughout the year so that you are prepared for your test when the time comes.

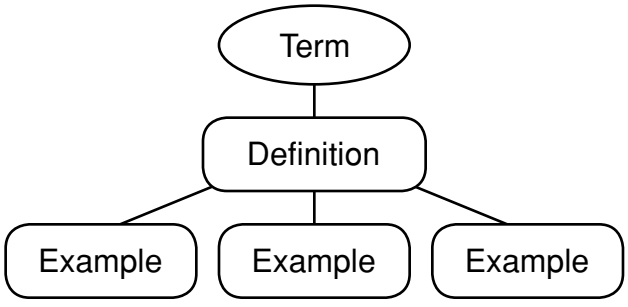
Identify important terms:

As you learn new concepts, keep a list of unfamiliar terms. Also, review the standards for your grade and write down any words you do not know.

Learn the meaning of each term:

Look up the meaning of each new word in your glossary. It may help to use the Vocabulary Questioning Strategies shown on the next page. Another way to learn vocabulary is by using graphic organizers like the ones shown below.





Memory aids:

Your lists of words may be used as memory aids, or it may be helpful to create flashcards with the term on the front and the definition and/or examples on the back. Review the flashcards frequently. As you learn the words, you may remove the flashcards from your stack, but keep them for occasional review before your exam.

Use context clues:

If you do encounter an unfamiliar word on your test, don't panic. Try to relate it to a familiar word or use context clues to determine the meaning of the word in the problem.

Vocabulary Questioning Strategies

Vocabulary term _____

Before you look up the word, predict its meaning. Some clues you can use are as follows:

- the way you have seen or heard the word used
- the everyday meaning of the word
- the meaning of the root word, prefix, or suffix

I think this word means _____

_____

Look up the word in your glossary, and write its meaning here.

_____

_____

Write a question in your own words that contains the vocabulary term, and write the answer.

Question: _____

_____

Answer: _____

_____

Think of a strategy to remember the meaning of the word. Some possible strategies are as follows: draw a picture that represents the word, write a poem or song about the word, or relate the math meaning to the everyday meaning of the word. Write your strategy here.

_____

_____

Math Anxiety

Math anxiety is a term used to describe fear and negative attitudes about working with numbers and taking math tests. Here are some suggestions to help alleviate math anxiety.

– Motivate yourself to learn math. Math class can be challenging, but it also has many rewards. Mathematics is a useful tool with a wide range of applications in nearly every field, as well as everyday life.

– Talk to your teacher about your anxiety. He or she may have suggestions or be able to help in other ways.

– Go to class every day! Research shows a strong correlation between attendance and math grades. Attending class should be a high priority.

– Make the most of your class time. Warm up for class by looking over the previous day's notes and homework. Write out any questions you have. If possible, read ahead in the text. Be alert and attentive. You won't get much benefit out of sleeping through class.

– Ask questions in class. If you just decide you can figure something out later, you may not understand the rest of the lecture, and fall further behind. Most often others will have the same question.

– Develop a note-taking system. If you are too busy writing every word the teacher says, you will not have time to comprehend much. Use abbreviations and shorthand during class, and re-work or re-write your notes soon after class to make sure you understand what was said.

– Do your homework as soon after class as possible. The longer you wait, the more you may forget. If you get behind, you will have a harder time understanding further material, and you may become frustrated.

– Find a study partner or group to work with. This will make math a more comfortable activity, maybe even fun!

– Find a place you are comfortable studying, where there are few distractions. If you have a certain place set aside for studying, you will find it easier to get into the right frame of mind to study there.

– Take breaks while studying. The mind works best in short periods of time, between 20 and 45 minutes. When you can't concentrate, take 5–10 minutes to walk around, stretch, or have a snack, then return to your work refreshed.

– Get help when you are stuck. Don't agonize for hours, ask your teacher, a tutor, a classmate, or a friend for help.

– Make a vocabulary list and a formula list. Use flashcards to memorize definitions and formulas. Remember, math is like a foreign language. You can't speak it if you don't know the words.

– To solidify your understanding, after you have done your homework, try the following:

  Check your answers against the answers in the back of the book.

  Do some extra problems from the book in areas you had trouble.

  Make up some practice problems and work them.

  Write out a general step-by-step procedure for solving each type of problem.

– Learn relaxation techniques and practice them before the test so that if you get frustrated you will be able to relax during the test.

– Learn more about math anxiety in books or on the Internet. Many people have math anxiety, and there are a lot of resources out there.

Troubleshooting

Taking practice tests can be helpful, but you will get more out of them if you analyze the tests after they have been scored to see where you made mistakes. Look at the table below to see some common types of mistakes. Use the blank rows to add in your own types with how you can avoid them in the future.

Type of mistake	Ways to avoid it in the future
I was unfamiliar with the concept involved in the question.	Review the standards to make sure I know what will be covered on the test.
I knew how to do the problem, but I couldn't remember.	Maintain skills throughout the year. Review old tests and homework to keep old topics fresh.
I misread the problem.	Read the problem carefully, and check my answer against the words of the problem to make sure the answer makes sense.
I did not know the meaning of a word in the problem.	Make lists of vocabulary terms and use vocabulary strategies to learn their meanings.
I did not transfer the answer to the answer sheet correctly.	Check frequently that the answers are in the right place. Circle the answer in the answer booklet or on scratch paper so I can go back and check it.

Name_____ Date _____ Class_____

NUMBERS AND OPERATIONS

Absolute Value

M7N1.a Find the absolute value of a number and understand it as the distance from zero on a number line.

Select the best answer for each question.

1. Which value is NOT equal to the absolute value of −50?

A $|-50|$
B $|50|$
C 50
D −50

2. Which value is equivalent to −7?

A $-(-7)$
B $|-7|$
C $|7|$
D $-|-7|$

3. Which value is the opposite of 4?

A $|4|$
B −4
C $-(-4)$
D $|-4|$

4. Which shows a pair of equivalent numbers?

A $-|6|$ and 6
B $-|-8|$ and 8
C (-3) and 3
D $|7|$ and 7

5. Which expression best represents the distance from 0 to −4 on a number line?

A −4
B $|-4|$
C $-|4|$
D $-|-4|$

6. What is the value of the expression below?

$$52 - |-15|$$

A 37
B 38
C 67
D 82

7. The chart shows the values of several stocks over two days. Which stock showed the greatest change?

Stock	Day 1	Day 2
ABC Corporation	$52.93	$56.35
BiggieMart	$74.16	$72.18
GoCar Company	$61.98	$53.85
FlyRight Airline	$12.55	$13.00

A ABC Corporation
B BiggieMart
C GoCar Company
D FlyRight Airline

Name_____ Date _____ Class _____

8. The Cougars football team started on the 30-yard line and fell back to the 19-yard line. Which expression can be used to find the change in their position?

A $|30 - 19|$ yards
B $|30 + 19|$ yards
C $|19| - |30|$ yards
D $-|30 - 19|$ yards

9. Which value is equal to the absolute value of 375?

A -375
B $-|-375|$
C $-|375|$
D $|375|$

10. The chart shows the temperature at noon in Portland, Maine, and the change from the previous day. Between which two days was the temperature change the greatest?

Day	1	2	3	4	5
Temp.	2°	6°	−3°	0	−8°

A days 1 and 2
B days 2 and 3
C days 3 and 4
D days 4 and 5

11. Ships that travel from Lake Erie to Lake Ontario pass through Welland Canal. At Lock 2, a ship was at −81.2 feet compared to the level of Lake Erie. At Lock 6, the ship was at −244.875 feet compared to the level of Lake Erie. What is the change in altitude between Lock 2 and Lock 6?

A −163.675 feet
B $|-158.475|$ feet
C 163.675 feet
D $|326.075|$ feet

12. The summit of Mount Everest is 29,035 feet above sea level. The Mariana Trench is −36,201 feet below sea level. Which expression could be used to find the change in elevation between these two locations?

A $|29{,}035 - (-36{,}201)|$
B $|-36{,}201 + 29.035|$
C $-|36{,}201| + |29.035|$
D $|-36{,}201| - |29{,}035|$

13. A skydiver jumped out of an airplane at 7,000 feet above ground level. the wind blew him off course and he landed on a hill 84 feet above ground level. Which expression shows the change in the skydiver's altitude?

A $|7{,}000| + |-84|$ feet
B $|7{,}000 - 84|$ feet
C $7{,}000 - (-84)$ feet
D $|84| + |7{,}000|$ feet

Name_____ Date _____ Class _____

14. What integer is described below?

> The absolute value of a number is 5, and the number lies to the left of 0 on the number line.

A -5
B 5
C $|-5|$
D $|5|$

15. Simplify the expression below.

$$8 - |-15|$$

A $|-7|$
B -7
C $|7|$
D 7

16. Which value is the opposite of $|-8|$?

A $|-8|$
B -8
C $|8|$
D 8

17. What is the value of the expression below?

$$|-3| - 8 + |-5|$$

A -6
B -6
C 0
D 6

18. The chart shows a submarine's depth for four hours. Which expression can be used to find the amount of the greatest change in one hour?

Time	1 PM	2 PM	3 PM	4 PM
Depth (meters)	−80	−204	−137	−171

A $|-80| + |-204|$ meters
B $-|204| - |-80|$ meters
C $-204 - (-80)$ meters
D $|-80 - (-204)|$ meters

19. Which expression best represents the distance from −3 to 7 on a number line?

A $-3 - 7$
B $|-3| - |7|$
C $|-3 - 7|$
D $|7| - |3|$

Name_____ Date _____ Class_____

NUMBERS AND OPERATIONS

Add and Subtract Rational Numbers

M7N1.c Add and subtract positive and negative rational numbers. Also M7N1.d

Select the best answer for each question.

1. Add.

$$5{,}643 + (-984) =$$

A −4,659
B –3,321
C 4,659
D 5,319

2. Subtract.

$$1{,}209 - (-217) =$$

A −1,426
B −992
C 992
D 1,426

3. Bill had $5,693.98 in his bank account. He spent $1,290.85 on a plasma TV. How much did Bill have left in his account?

A $3,209.83
B $4,198.63
C $4,403.13
D $4,841.93

4. Divers discovered a shipwreck lying 54 feet below sea level. The crane they rented to hoist up pieces of the wreck stood 87 feet above sea level. What is the distance between the level of the wreck and the level of the crane?

A 33 feet
B 141 feet
C 131 feet
D 151 feet

5. The table shows the extreme temperatures for Barrow, Alaska.

Extreme	Temperature (in °A)
Lowest	–56°
Highest	79

What is the difference between these two temperatures?

A −135°F
B −23°F
C 23°F
D 135°F

6. At the football game, Joe carried the ball four times. He had a loss of 15 yards, a gain of 2 yards, a loss of 5 yards, and a gain of 7 yards. What was his total yardage?

A −29 yards
B −20 yards
C −11 yards
D 9 yards

Name_____ Date _____ Class _____

7. Rico recorded how many miles he ran during the past five days. What is the total number of miles that he ran?

Number of Miles Ran per Day				
Day 1	Day 2	Day 3	Day 4	Day 5
$3\frac{1}{4}$	$2\frac{1}{8}$	$4\frac{1}{8}$	$2\frac{1}{2}$	$3\frac{3}{8}$

A $14\frac{7}{30}$ miles **B** $15\frac{7}{30}$ miles

C $15\frac{3}{8}$ miles **D** $15\frac{3}{4}$ miles

8. Tom is raising money for a charity. On Thursday, he raised 21% of his total goal. On Wednesday, he rasied another 38%. As percentage of his goal, how much more does Tom have to raise to reach 100%?

A 25% **B** 41%

C 66% **D** 75%

9. What is the sum of −234 and −424?

A −658 **B** −190

C 190 **D** 658

10. Charles' bank statement is shown below. If his beginning balance was $32, what is his ending balance?

Bank Statement

Date	Transaction	Amount
Jan 3	Deposit	$432
Jan 8	Deposit	$102
Jan 22	Withdrawal	$387
Feb. 6	Withdrawal	$18
Feb. 18	Deposit	$321

A $380 **B** $450

C $482 **D** $1,292

11. Mr. Jones needs help painting a small shed on his property. Leroy painted $\frac{3}{10}$ of the shed, Rahmad painted $\frac{5}{12}$ of the shed, and Cindy painted $\frac{1}{5}$ of the shed. How much of the shed does Mr. Jones have to paint to complete the project?

A $\frac{1}{12}$

B $\frac{1}{3}$

C $\frac{5}{6}$

D $\frac{11}{12}$

12. What is the difference of 679 and −130?

A −809

B −549

C 549

D 809

13. The table shows the highest and lowest elevations in Louisiana.

Location	Elevation (in feet)
Driskill Mountain	535
New Orleans	–8

What is the difference of the highest and lowest elevations?

A −543 feet

B −527 feet

C 527 feet

D 543 feet

Name_____ Date _____ Class_____

14. The temperature in the afternoon was −2°F. The temperature rose 12 degrees overnight. What was the temperature in °F the next morning?

A −14
B 2
C 10
D 14

15. Chantal is thinking of buying one of these backpacks for school. How much more is the one with wheels than the one without wheels?

A $11.55
B $12.55
C $12.65
D $72.45

16. Add.

$$-564 + 583 =$$

A −1,147
B −19
C 19
D 1,147

17. The table shows the times of the different parts of Sarah's flight from Dallas to New York.

Flight Part	Time (in hours)
Dallas to Chicago	2
Layover in Chicago	$1\frac{5}{6}$
Chicago to New York	$2\frac{1}{2}$

How long in all did it take Sarah to go from Dallas to New York?

A $4\frac{1}{3}$ hours
B $5\frac{1}{3}$ hours
C $5\frac{3}{4}$ hours
D $6\frac{1}{3}$ hours

18. Subtract.

$$-906 - 583 =$$

A −1,489
B −323
C 323
D 1,489

Name_____ Date _____ Class_____

NUMBERS AND OPERATIONS

Compare and Order Rational Numbers

M7N1.b Compare and order rational numbers, including repeating decimals.

Select the best answer for each question.

1. The lengths in miles of some major rivers are shown in the chart.

Heilong River	Irtish River	Parana River	Zaire River
2,758 miles	2,704 miles	2,795 miles	2,716 miles

Which of the following shows those lengths in order from least to greatest?

A 2,704, 2,716, 2,795, 2,758
B 2,795, 2,758, 2,716, 2,704
C 2,704, 2,758, 2,716, 2,795
D 2,704, 2,716, 2,758, 2,795

2. Jacob collected some rocks for a rock garden. The rocks weighed 13.05, 13.55, 13.055, and 13.5 kilograms. Which shows the weights of the rocks in order from greatest to least?

A 13.55, 13.5, 13.055, 13.05
B 13.55, 13.055, 13.5, 13.05
C 13.05, 13.055, 13.5, 13.55
D 13.05, 13.5, 13.055, 13.55

3. Which of the following shows the mixed numbers in order from least to greatest?

A $2\frac{3}{4}, 2\frac{5}{8}, 2\frac{4}{7}, 2\frac{7}{10}$
B $2\frac{4}{7}, 2\frac{5}{8}, 2\frac{7}{10}, 2\frac{3}{4}$
C $2\frac{3}{4}, 2\frac{4}{7}, 2\frac{5}{8}, 2\frac{7}{10}$
D $2\frac{4}{7}, 2\frac{7}{10}, 2\frac{3}{4}, 2\frac{5}{8}$

4. Four friends played a video game. Troy scored 24,538 points, Lauren scored 24,358 points, Matt scored 25,338 points, and Becky scored 23,485 points. Who won the game?

A Becky
B Lauren
C Matt
D Troy

5. In the game of golf, the lowest score wins. The chart shows the average score of four golfers.

Tom	Bill	Fred	Cory
69.24	68.42	68.04	68.02

Who has the best average score?

A Bill
B Cory
C Fred
D Tom

Name_____ Date _____ Class_____

6. Which of the following shows the decimals in order from greatest to least?

A 0.07, 0.67, 0.067, 0.607
B 0.067, 0.67, 0.07, 0.607
C 0.607, 0.67, 0.07, 0.067
D 0.67, 0.607, 0.07, 0.067

7. A team of scientists in the Arctic recorded the following daily high temperatures at their base camp.

Day 1	Day 2	Day 3	Day 4
−34°	−24°	−29°	−36°

Which day was the warmest day?

A Day 1
B Day 2
C Day 3
D Day 4

8. Marco collects stamps. He has stamps that are $\frac{3}{4}$ inches wide, $\frac{3}{5}$ inches wide, $\frac{5}{8}$ inches wide, and $\frac{4}{7}$ inches wide. Which shows the stamps in order from least to greatest width?

A $\frac{4}{7}, \frac{3}{5}, \frac{5}{8}, \frac{3}{4}$
B $\frac{3}{4}, \frac{3}{5}, \frac{4}{7}, \frac{5}{8}$
C $\frac{3}{4}, \frac{3}{5}, \frac{5}{8}, \frac{4}{7}$
D $\frac{4}{7}, \frac{5}{8}, \frac{3}{5}, \frac{3}{4}$

9. When ordering the fractions $\frac{1}{3}$, $\frac{4}{5}$, $\frac{7}{8}$, and $\frac{1}{6}$, which common denominator should be used?

A 40
B 80
C 720
D 120

10. During the gymnastics meet, Danielle received the following scores for her performance on the balance beam.

Judge A	Judge B	Judge C	Judge D
8.97	8.87	8.78	8.98

Which judge gave her the least score?

A Judge A **B** Judge B
C Judge C **D** Judge D

11. Mars is at least 205,000,000 miles from the sun, Neptune is at least 2,770,000,000 miles from the Sun, Saturn is at least 840,000,000 miles from the Sun, and Jupiter is at least 460,000,000 miles from the Sun. Which planet has the greatest distance from the Sun?

A Mars **B** Neptune
C Saturn **D** Jupiter

12. Which of the following shows the integers in order from greatest to least?

A −15, 8, −4, 2
B 2, −4, 8, −15
C −15, −4, 2, 8
D 2, 8, −4, −15

Name_____ Date _____ Class _____

13. Which temperature is between 8°F and −12°F?

A −14°F

B −9°F

C 10°F

D 12°F

14. Which numbers are in order from least to greatest?

A $-\frac{1}{3}, -\frac{4}{9}, \frac{3}{8}, -\frac{5}{6}$

B $-\frac{5}{6}, -\frac{1}{3}, -\frac{4}{9}, \frac{3}{8}$

C $-\frac{1}{3}, -\frac{4}{9}, -\frac{5}{6}, \frac{3}{8}$

D $-\frac{5}{6}, -\frac{4}{9}, -\frac{1}{3}, \frac{3}{8}$

15. The table shows the population of four states according to the 2000 census.

State	Population (millions)
Arkansas	2.673
Iowa	2.926
Kansas	2.688
Texas	20.852

Which shows the states in order from the greatest population to the least population?

A Texas, Kansas, Iowa, Arkansas

B Iowa, Kansas, Arkansas, Texas

C Iowa, Texas, Kansas, Arkansas

D Texas, Iowa, Kansas, Arkansas

16. According to the 2000 U.S. Census, at least 1 but fewer than 7 out of every 100 people in the United States was under the age of 5. Which could be the percent of the U.S. population under the age of 5?

A 0.68%

B 6.8%

C 68%

D 680%

17. A meteorologist records how many inches above or below the average monthly rainfall a location receives every month. The table shows the data for four months in one city.

Actual Rainfall Compared to Average Rainfall (in inches)	
Month	**Rainfall Difference**
May	1.25
June	−1.75
July	0.625
August	−2.5

Which shows these measurements in order from least to greatest?

A −1.75, −2.5, 0.625, 1.25

B −2.5, −1.75, 0.625, 1.25

C −1.75, −2.5, 1.25, 0.625

D 0.625, 1.25, −1.75, −2.5

18. Which temperature is between 10°F and −5°F?

A −10°F

B −9°F

C 7°F

D 11°F

Name_____ Date _____ Class_____

NUMBERS AND OPERATIONS

Multiply and Divide Rational Numbers

M7N1.d Solve problems using rational numbers. Also M7N1.c

Select the best answer for each question.

1. Multiply.

$$-79 \times 24 =$$

A −1,896
B −1,638
C 1,459
D 1,896

2. Divide.

$$-12\overline{)354}$$

A −31
B −29.5
C 29.5
D 32.75

3. As a cold front passed through an area, the temperature changed by an average of −4°F per hour for 5 hours. What was the total temperature change as the front passed?

A −20°F
B −9°F
C 1°F
D 18°F

4. A park naturalist is posting a sign at the beginning of every 0.3-mile segment of a trail. The signs tell hikers about a feature of the trail that they will see in that segment. If the trail is 6 miles long, how many signs must the naturalist post?

A 2
B 5
C 18
D 20

5. A recipe calls for $1\frac{3}{4}$ cups of flour. Van wants to make one and one-half times the recipe. How much flour should he use?

A $\frac{7}{8}$ cup
B $1\frac{1}{6}$ cups
C $1\frac{3}{8}$ cups
D $2\frac{5}{8}$ cups

6. What is $9\frac{3}{5}$ divided by $2\frac{2}{3}$?

A $3\frac{1}{2}$
B $3\frac{3}{5}$
C 10
D $28\frac{4}{5}$

Name_____ Date _____ Class _____

7. Which is the quotient of 784 and −12?

A $-65\frac{1}{3}$

B $-65\sqrt{5}$

C $65\sqrt{4}$

D $65\frac{1}{3}$

8. Find the product.

$$(-3) \times (-8) \times (-7) \times (-19) =$$

A −3,192

B −2,312

C 2,438

D 3,192

9. Multiply.

$$4.264 \times 3.00273 =$$

A 12.8036

B 12.80364

C 12.8036407

D 12.80364072

10. Over a 4-week period, the price of a gallon of gas changed by −12 cents. What was the average change per week?

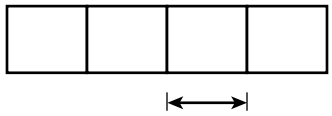
A −48 cents

B −8 cents

C −3 cents

D 2 cents

11. Cement blocks used for foundations are $15\frac{5}{8}$ inches long. How many cement blocks would be needed to make a row 24 feet long?



$15\frac{5}{8}$ inches

A $16\frac{7}{10}$ blocks

B $18\frac{54}{125}$ blocks

C $39\frac{5}{8}$ blocks

D 360 blocks

12. Multiply.

$$-46 \times (-153) =$$

A −7,058

B −7,038

C 7,038

D 7,058

13. Multiply.

$$12(-3)(-5)$$

A −180

B 72

C 180

D 540

14. Divide.

$$-336 \div 56 =$$

A −6

B −5

C 5

D 6

Name_____ Date _____ Class_____

15. Carlos is shopping for a new couch. He found the same couch at four different stores. Which store will give Carlos the best deal on the couch?

Store	Original Cost of Couch	Special Offer
Value Furniture	$575.00	$75.00 off
Couch Express	$530.00	10% discount
Furniture For Less	$615.00	$\frac{1}{3}$ off
Biggie Furniture	$550.00	25% discount

A Value Furniture
B Couch Express
C Furniture for Less
D Biggie Furniture

16. Juni bought a gift for her friend's birthday. The item cost $15.75. The sales tax was 6.5%. Juni paid with a $20.00 bill. Which shows how much change Juni received?

A $1.02
B $3.23
C $4.03
D $4.25

17. Alicia got all the questions on the math test correct except one. She incorrectly found the quotient $-238 \div (-14)$ to be 15. What is the correct quotient?

A -15
B -14
C 14
D 17

18. Multiply.

$$-35 \times 562 =$$

A $-19{,}670$
B $-18{,}450$
C 18,450
D 19,670

19. Four friends decided to eat at the Pizza Palace and share the cost of their dinner equally.

PIZZA PALACE	
Medium pizza	$9.99
Large pizza	$12.99
Toppings (each)	$1.38

How much would each pay for 2 large 2-topping pizzas and a medium 1-topping pizza?

A $6.44
B $10.72
C $35.97
D $42.87

Name_____ Date _____ Class_____

GEOMETRY

Constructions

M7G1.a Perform basic constructions using both compass and straight edge, and appropriate technology. Also M7G1.b

Select the best answer for each question.

1. Which method could NOT be used to construct a 45° angle?

A Use a ruler to draw a square, then draw a diagonal to form a 45° angle.

B Draw a segment, then use a protractor to locate a 45° angle.

C Construct two perpendicular lines, then bisect a right angle formed by the lines.

D Construct two perpendicular lines, then use a ruler to draw a 45°-45°-90° triangle with the right angle at the intersection.

2. A segment is 2.7 cm long. Constructing the midpoint divides the segment into two segments of what length?

A 0.85 cm

B 1.35 cm

C 1.85 cm

D 2.35 cm

3. What is the measure of the angles formed by bisecting an interior angle of an equilateral triangle?

A 30°

B 35°

C 40°

D 45°

4. Which construction is NOT related to the construction of a perpendicular bisector of a segment?

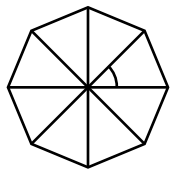
A midpoint

B a line perpendicular to a given line through a point on the line

C a line perpendicular to a given line through a point not on the line

D a line parallel to a given line through a point not on the line

5. Eight isosceles triangles where put together to create a octagon. What is the measure of one of the angles in the center?



A 40°

B 45°

C 50

D 80°

6. The bisector of an angle forms two congruent angles. The bisector of one of those angles forms two 15° angles. What is the measure of the original angle?

A 60°

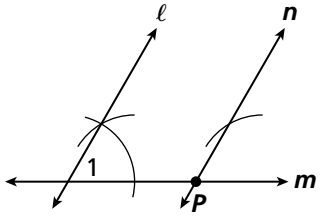
B 30°

C 15°

D 7.5°

Name_____ Date _____ Class_____

The figure shows the construction of a line parallel to line ℓ through point *P* not on ℓ. Use this figure to answer questions 7–9.



7. Lines ℓ and *n* are intersected by transversal *m*. What type of angle pair are $\angle 1$ and $\angle nPm$?

A same-side exterior angles

B same-side interior angles

C corresponding angles

D alternate interior angles

8. The first step in the construction is to draw the transversal *m*. What is the second step?

A Construct $\angle 2$ congruent to $\angle 1$.

B Draw line *n*.

C Construct $\angle 1$.

D Construct the intersection of line *m* and line *n*.

9. In the construction, which statement explains why line $\ell \parallel$ line n?

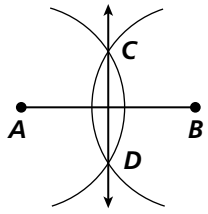
A If vertical angles are congruent, then the lines are parallel.

B If corresponding angles are congruent, then the lines are parallel.

C If *P* is the intersection of *m* and *n*, then the lines are parallel.

D If line *m* is a transversal to lines ℓ and *n*, then the lines are parallel.

The figure shows the construction of the perpendicular bisector of $\overline{AB}$. Use this figure to answer questions 10 and 11.



10. In the construction, which statement explains why point *C* is the same distance from point *A* as it is from point *B*?

A Point *C* is the midpoint of $\overline{AB}$.

B $\overline{CD}$ is perpendicular to $\overline{AB}$.

C The same compass setting was used to construct both arcs.

D A straightedge was used to draw $\overline{CD}$ through points *C* and *D*.

11. In the construction, which statement explains why $\overline{CD}$ is the perpendicular bisector of $\overline{AB}$?

A The perpendicular bisector of a segment is the set of points that are equidistant from both endpoints.

B The perpendicular bisector of a segment passes through the midpoint of the segment.

C The perpendicular bisector of a segment is uniquely determined by the endpoints.

D The perpendicular bisector of a segment intersects the segment at exactly one point.

Name_____ Date _____ Class _____

12. A segment is drawn on paper. Which figure can be formed by folding the paper so that the endpoints of the segment match up?

A angle bisector
B parallel line
C midpoint
D congruent segment

13. $\overline{KL}$ has a length of 30 cm. Kyra constructs the midpoint M of $\overline{KL}$, then constructs the midpoints of $\overline{KM}$ and $\overline{LM}$. Which is NOT the length of a segment in the figure?

A 7.5 cm
B 15 cm
C 10 cm
D 22.5 cm

14. Which angle measure can NOT be formed by bisecting an interior angle of a regular polygon?

A 72°
B 76°
C 45°
D 30°

15. What is the size of the angle formed by bisecting an interior angle of a pentagon?

A 54°
B 36°
C 72°
D 108°

16. An angle has a measure of 80°. What is the measure of the angle formed by bisecting the angle, then bisecting one of the angles formed?

A 80°
B 60°
C 40°
D 20°

17. Point J is on the angle bisector of $\angle FGH$ such that $\overline{JF} \perp \overline{GF}$ and $\overline{JH} \perp \overline{GH}$. What kind of quadrilateral is $FGHJ$?

A rectangle
B kite
C square
D parallelogram

18. Point X is on the perpendicular bisector of $\overline{ST}$. If W is the midpoint of ST, which statement is NOT true?

A $\triangle SWX \cong \triangle TWX$
B $\angle SWX \cong \angle TWX$
C $\overline{SW} \cong \overline{TW}$
D $\triangle SWX$ is isosceles.

19. $\angle ABC$ is drawn on paper. How can you fold the paper to construct the angle bisector?

A Match up points B and C.
B Match up $\overline{AC}$ and $\overline{BC}$.
C Match up $\overline{BA}$ and $\overline{BC}$.
D Match up $\angle ABC$ and $\angle BAC$.

Name_____ Date _____ Class_____

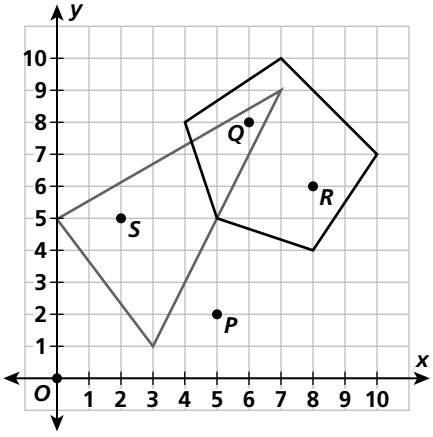
GEOMETRY

Coordinate Geometry

M7G2.b Given a figure in the coordinate plane, determine the coordinates resulting from a translation, dilation, rotation, or reflection. Also M7A3.a

Select the best answer for each question.

Use the figure below to answer questions 1–3.



1. Which point is located at the coordinates $(8, 6)$?

A Point *P*
B Point *Q*
C Point *R*
D Point *S*

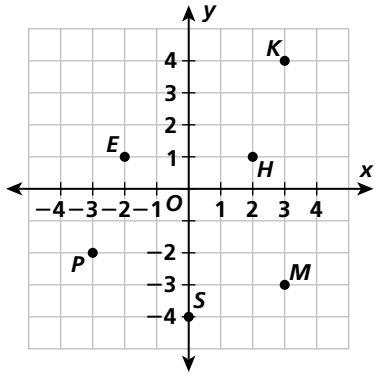
2. Which of these ordered pairs is a vertex of the pentagon?

A $(4, 8)$
B $(5, 6)$
C $(8, 9)$
D $(10, 8)$

3. Which ordered pair represents a point located inside the triangle and outside the pentagon?

A $(2, 5)$
B $(6, 8)$
C $(8, 4)$
D $(8, 6)$

Use the figure below to answer questions 4–6.



4. Which points have positive coordinates?

A Points *E* and *H*
B Points *P* and *E*
C Points *H* and *K*
D Points *K*, *H*, and *M*

Name_____ Date _____ Class_____

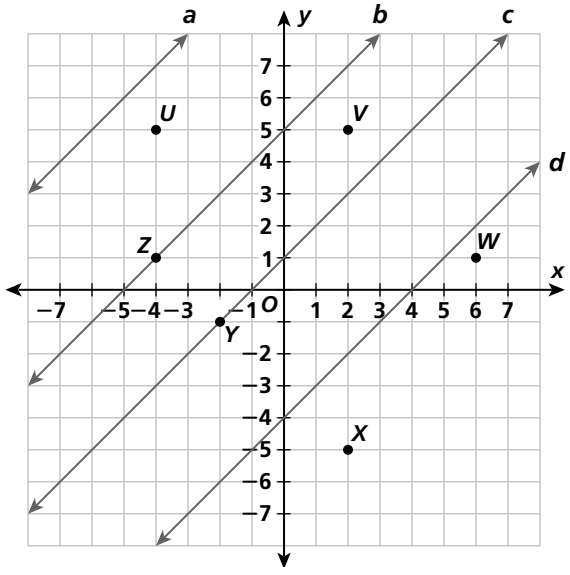
5. Points E, H, and K are three vertices of a parallelogram. Where is the fourth vertex?

A $(4, 0)$
B $(0, 4)$
C $(-1, 4)$
D $(1, 4)$

6. Where is the midpoint of $\overline{PK}$?

A $(-1, 1)$
B $(0, 0)$
C $(1, 0)$
D $(0, 1)$

Use the figure below to answer questions 7–13.



7. Which line contains the point with coordinates $(-3, -7)$?

A line a
B line b
C line c
D line d

8. What shape do you get if you connect points U, V, W, and Z?

A pentagon
B parallelogram
C trapezoid
D rectangle

9. Which two points have the same x-coordinate?

A Points U and V
B Points X and V
C Points W and Z
D Points X and Y

10. Draw the line through points V and W. Where does this line intersect line c?

A $(1, 6)$
B $(2, 5)$
C $(3, 4)$
D $(4, 3)$

11. Which three points are the vertices of an isosceles triangle?

A Points U, V, Z
B Points W, Y, U
C Points X, W, Z
D Points Z, Y, V

12. Which line segment is not parallel to the others?

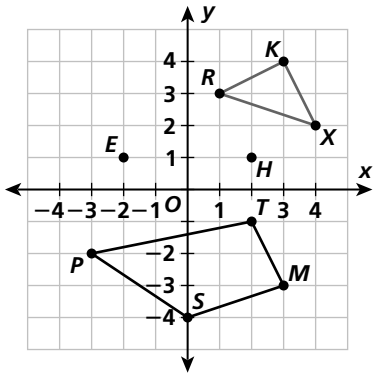
A $\overline{VW}$
B $\overline{UY}$
C $\overline{XZ}$
D $\overline{XY}$

Name_____ Date _____ Class_____

13. Points *U*, *V*, and *Z* are three vertices of a rectangle. What is the fourth?

A $(2, 1)$
B $(3, 1)$
C $(1, 2)$
D $(2, 0)$

Use the figure below to answer questions 14–16.



14. Reflect $\triangle RKX$ across the *y*-axis. What are the new coordinates of point *K*?

A $(3, -4)$
B $(-3, -4)$
C $(4, -3)$
D $(-3, 4)$

15. Reflect *PTMS* across the *x*-axis. What are the new coordinates of point *S*?

A $(0, 4)$
B $(0, -4)$
C $(4, 0)$
D $(-4, 0)$

16. Which two points are reflections of each other across the *x*-axis?

A *E* and *H*
B *K* and *M*
C *H* and *T*
D *P* and *X*

17. Where are all the points that have positive *x*-coordinate and negative *y*-coordinate?

A in quadrant I
B in quadrant II
C in quadrant III
D in quadrant IV

18. Where are all the points that have 0 as the *x*-coordinate?

A on the *x*-axis
B on the *y*-axis
C in quadrant I
D in quadrant III

19. What are the coordinates of the following point?

Start from the origin, go seven units to the left, then 3 units down.

A $(0, -7)$
B $(3, -7)$
C $(7, -3)$
D $(-7, -3)$

Name_____ Date _____ Class_____

GEOMETRY

Line Symmetry

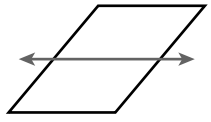
M7G2.a Demonstrate understanding of translations, dilations, rotations, reflections, and relate symmetry to appropriate transformations.

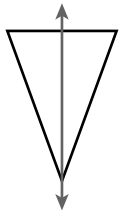
Select the best answer for each question.

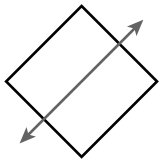
1. Which quadrilateral always has 4 lines of symmetry?

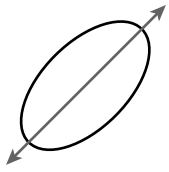
A rectangle
B rhombus
C square
D parallelogram

2. Which figure does not show a line of symmetry?

A


B


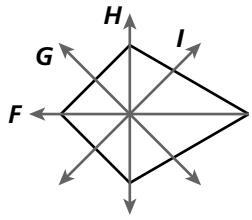
C


D


3. How many lines of symmetry does a circle have?

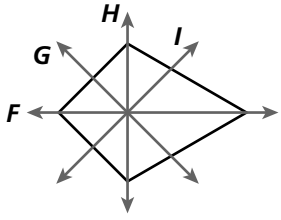
A 0
B 1
C 4
D an infinite number

4. Which is a line of symmetry of the figure?



A horizontal line
B vertical line
C diagonal line
D There are no lines of symmetry.

5. Which line is a line of symmetry for this kite?



A F
B G
C H
D I

6. Which of the following figures has exactly 2 lines of symmetry?

A trapezoid
B ellipse
C circle
D kite

Name_____ Date _____ Class_____

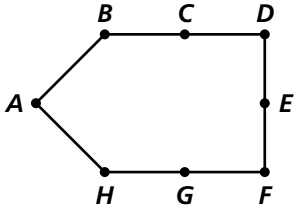
7. Which type of triangle cannot have a line of symmetry?

A right
B isosceles
C equilateral
D scalene

8. How many lines of symmetry does a rhombus have?

A 0
B 1
C 2
D 4

9. Which points can you connect to make a line of symmetry in this pentagon?



A points *A* and *D*
B points *A* and *E*
C points *B* and *F*
D points *C* and *G*

10. Which of the following figures has fewer than 3 lines of symmetry?

A regular hexagon
B equilateral triangle
C rhombus
D square

11. Which of the following types of regular polygons has lines of symmetry that pass through 2 vertices?

A pentagon
B heptagon
C triangle
D octagon

12. In which regular polygons is a diagonal a line of symmetry?

A all regular polygons
B no regular polygons
C regular polygons with an even number of sides
D regular polygons with an odd number of sides

13. A polygon has exactly one line of symmetry that passes through a vertex and the midpoint of a side. Which of the following statements is NOT true?

A The polygon must be a triangle.
B The polygon must have an uneven number of sides.
C The polygon must have at least 1 pair of congruent sides.
D The polygon must have at least 1 pair of congruent angles.

Name_____ Date _____ Class _____

14. Which statement is true about the trapezoid below?

A There are no lines of symmetry.

B The diagonals are lines of symmetry.

C The line of symmetry is vertical.

D The line of symmetry is horizontal.

15. Which of the following is a property of a trapezoid that has line symmetry?

A All sides are equal in length.

B The opposite, nonparallel sides are equal in length.

C The trapezoid is scalene.

D The line of symmetry is parallel to the two parallel sides of the trapezoid.

16. Which figure has only 1 line of symmetry?

A scalene triangle

B equilateral triangle

C rhombus

D isosceles triangle

17. An octagon has 2 lines of symmetry. What is the greatest number of different side lengths that the octagon can have?

A 8

B 7

C 6

D 3

18. Which of the following statements is always true for lines of symmetry in regular polygons?

A As the number of sides increases, the number of lines of symmetry decreases.

B As the number of sides increases, the number of lines of symmetry increases.

C The number of lines of symmetry is half the number of sides.

D Each line of symmetry connects a pair of opposite vertices.

Name_____ Date _____ Class_____

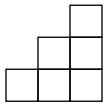
GEOMETRY

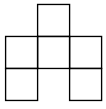
Rotational Symmetry

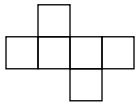
M7G2.a Demonstrate understanding of translations, dilations, rotations, reflections, and relate symmetry to appropriate transformations.

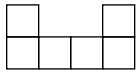
Select the best answer for each question.

1. Which design has rotational symmetry?

A 

B 

C 

D 

2. Which statement is true?

A A figure with line symmetry always has rotational symmetry.

B A figure with line symmetry never has rotational symmetry.

C A figure with line symmetry has rotational symmetry if it has two lines of symmetry.

D A figure with line symmetry has rotational symmetry if it has two perpendicular lines of symmetry.

3. For what degree of rotation about the center does a circle coincide with itself?

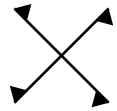
A 45°

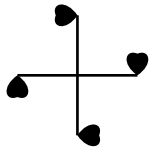
B 180°

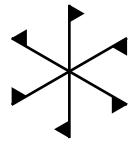
C 270°

D any degree of rotation

4. Which design will not look the same after a 180° rotation?

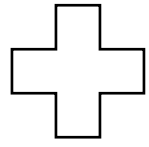
A 

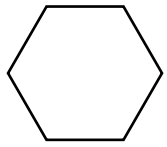
B 

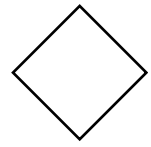
C 

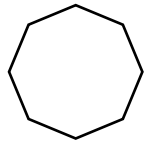
D 

5. Which figure will not look the same after a 90° rotation?

A 

B 

C 

D 

6. How many degrees are there in a rotation that is $\frac{1}{4}$ of a complete turn?

A 30°

B 45°

C 90°

D 180°

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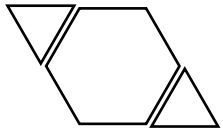
7. What types of symmetry does this design have?



A line symmetry
B rotational symmetry
C line and rotational symmetry
D no symmetry

8. Which statement is true about the rotational symmetry of regular polygons?

A All regular polygons have rotational symmetry.
B Only regular polygons with even number of sides have rotational symmetry.
C Only regular polygons with odd number of sides have rotational symmetry.
D Regular polygons do not have rotational symmetry.

9. Which type of triangle has rotational symmetry?

A equilateral
B isosceles
C scalene
D No triangle can have rotational symmetry.

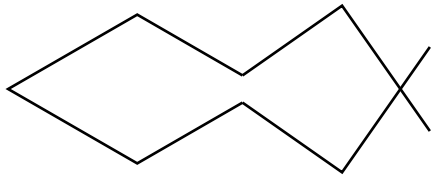
10. A design consists of a regular hexagon inscribed in a circle. For which of the following degrees of rotation will the figure look the same?

A 30°
B 60°
C 90°
D 270°

11. Which of the following regular polygons will look the same after a 72° rotation?

A triangle
B pentagon
C decagon (10-sided polygon)
D both *B* and *C*

12. What types of symmetry does this design have?



A line symmetry
B rotational symmetry
C line and rotational symmetry
D no symmetry

13. A regular polygon with how many sides will look the same after a 40° rotation?

A any multiple of 40
B any number of sides
C any multiple of 9
D any even number of sides

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14. After which rotation will a square not look the same?

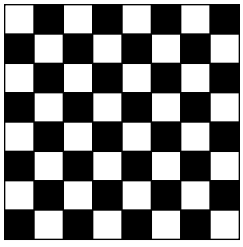
A 45°

B 90°

C 180°

D 360°

15. Consider the top view of a chessboard. Which statement is true?



A The board has a horizontal line of symmetry.

B The board has a vertical line of symmetry.

C The board has 90° rotational symmetry.

D The board has 180° rotational symmetry.

16. Which of the following figures has line symmetry but not rotational symmetry?

A equilateral triangle

B kite

C rhombus

D scalene triangle

17. A figure looks the same after a rotation of 120°. What shape can this figure be?

A regular hexagon

B circle

C equilateral triangle

D all of the above

18. Which of the following statements is true about rotational symmetry in regular polygons?

A For a regular polygon with n sides, the least degree of rotation for which the figure will look the same is $\frac{360}{n}$.

B For a regular polygon, there are infinitely many different rotations after which the figure will look the same.

C Both *A* and *B* are true.

D Neither *A* nor *B* are true.

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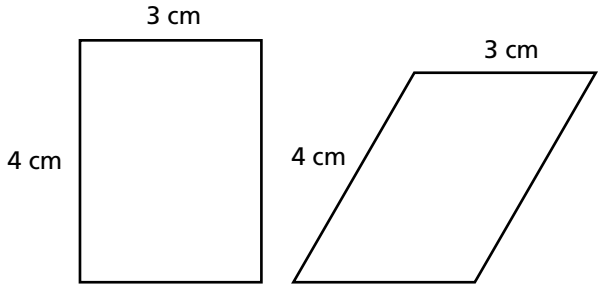
GEOMETRY

Similar Polygons

M7G3.a Understand the meaning of similarity, visually compare geometric figures for similarity, and describe similarities by listing corresponding parts. Also M7G3.b and M7G3.c

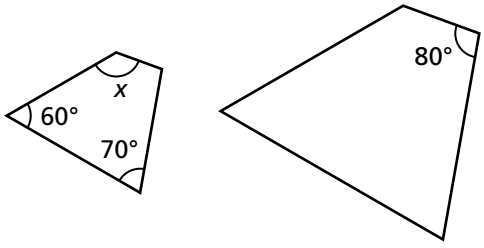
Select the best answer for each question.

1. Which describes the relationship between these quadrilaterals?



A congruent and similar
B congruent but not similar
C similar but not congruent
D neither congruent nor similar

2. Figures *A* and *B* are similar. What is the measure of angle *x*?



A 100°
B 150°
C 200°
D not enough information to answer

3. River A has a length of 10 cm on the map. If the map uses a scale of 1 cm : 2 m, what is the length of the actual river?

A 20 cm
B 200 cm
C 20 m
D 200 m

4. Which similarity statement is true, given that rectangle *ABCD* has side lengths $AB = 3$ and $BC = 4$, and rectangle *EFGH* has side lengths $HG = 8$ and $EH = 6$?

A rectangle *ABCD* is similar to rectangle *EFGH*
B rectangle *ABCD* is similar to rectangle *HGFE*
C rectangle *ABCD* is similar to rectangle *HGEF*
D rectangle *ABCD* is similar to rectangle *EHGF*

5. Figures *A* and *B* are similar figures. One side of *A* has a length of 9 cm, and the corresponding side of *B* has a length of 12 cm. The three other sides of *A* have lengths of 6 cm, 12 cm, and 3 cm. What is NOT a possible length of a side of *B*?

A 8 cm
B 16 cm
C 9 cm
D 4 cm

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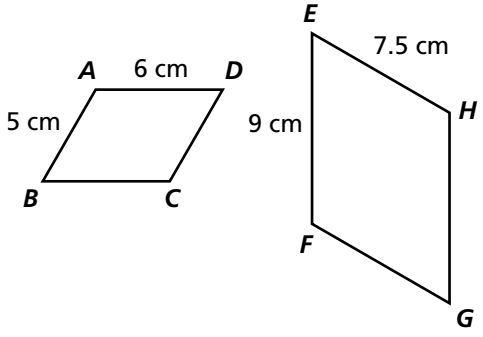
6. Which polygon is similar to every other polygon of the same shape?

A triangle
B rectangle
C square
D trapezoid

Use the similar quadrilaterals to answer questions 7–9.



7. Which statement shows the sides of the quadrilaterals are proportional?

A $AB:EF = AD:EH$
B $AB:HE = AD:HG$
C $AB:HE = AD:EH$
D $AB:FE = AD:FG$

8. What is the ratio of corresponding sides?

A 5 to 9
B 4 to 5
C 1 to 2
D 2 to 3

9. Suppose the length of $\overline{AB}$ is doubled while the length of $\overline{AD}$ remains the same. What is the length of $\overline{EF}$ if the quadrilaterals remain similar?

A 15 cm
B 9 cm
C 18 cm
D 12.5 cm

10. The side lengths of two similar squares are in the ratio 3 : 2. One side of the smaller square is 12 cm. What is the perimeter of the larger square?

A 72 cm
B 68 cm
C 48 cm
D 36 cm

11. Rectangle *A* has a width of 3.6 m and a length of 7.2 m. Rectangle *B* is similar to rectangle *A* and has a width of 1.8 m. Which is the length of rectangle *B*?

A 7.2 m
B 0.9 m
C 3.6 m
D 4.8 m

12. The lengths of corresponding sides of similar rectangles are in the ratio 5 : 2. The perimeter of the smaller rectangle is 40 ft. What is the perimeter of the larger rectangle?

A 16 ft
B 100 ft
C 500 ft
D 50 ft

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13. Which of the following could be corresponding side lengths of two similar triangles?

A 1.5, 2.5, 3.5 and 6, 10, 12

B 3, 4, 5 and 6, 7, 8

C 3.3, 4.4, 5.5 and 4.5, 6, 7.5

D 2, 5, 8 and 3, 7.5, 10

14. A quadrilateral has sides 2.2 cm, 3.3 cm, 4.4 cm, and 5.5 cm. Which are the dimensions of a similar quadrilateral?

A 11 cm, 16.5 cm, 22.5 cm, 27.5 cm

B 2 cm, 3 cm, 4 cm, 5 cm

C 8.8 cm, 13.2 cm, 17.6 cm, 20 cm

D 8.8 cm, 9.9 cm, 13.2 cm, 17.5 cm

15. Which statement is true for similar figures?

A Similar figures always have the same size.

B Similar figures always have the same shape.

C Similar figures never have the same size.

D Similar figures never have the same shape.

16. Two figures are similar. The side lengths of the larger figure are triple the side lengths of the smaller figure. The angles in the smaller figure measure 105°, 75°, 108°, and 72°. What are the angle measures of the larger figure?

A not enough information to answer

B 35°, 25°, 36°, 24°

C 315°, 225°, 324°, and 216°

D 105°, 75°, 108°, 72°

17. The ratio of the corresponding side lengths of two rectangles is 3 to 1. The area of the larger rectangle is 45 m^2. What is the area of the smaller rectangle?

A 5 m^2

B 12 m^2

C 15 m^2

D 30 m^2

18. Which of these statements is false?

A All congruent figures are similar.

B All similar figures are congruent.

C The lengths of corresponding sides in similar figures are proportional.

D The perimeters of congruent figures are the same.

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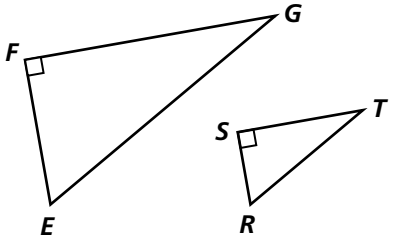
GEOMETRY

Similar Triangles

M7G3.b Understand the relationships among scale factors, length ratios, and area ratios between similar figures. Use scale factors, length ratios, and area ratios to determine side lengths and areas of similar geometric figures. Also M7G3.a and M7G3.c

Select the best answer for each question.

Use this pair of similar triangles to answer questions 1–4. The ratio of corresponding sides is 2 : 1.



1. Triangle *GFE* is similar to which triangle?

A $\triangle SRT$
B $\triangle RST$
C $\triangle TSR$
D $\triangle TRS$

2. If $RT = 2.5$ cm, what is EG?

A 1.25 cm
B 0.5 cm
C 5.0 cm
D 12.5 cm

3. Which side is twice as long as $\overline{ST}$?

A $\overline{EG}$
B $\overline{FG}$
C $\overline{ST}$
D $\overline{RS}$

4. If $m\angle R = 60°$, what is $m\angle G$?

A 30°
B 60°
C 120°
D There is not enough information to solve the problem.

5. Which term best describes the corresponding sides in a pair of congruent triangles?

A similar
B congruent
C proportional
D parallel

6. Which of the following combinations of given information from $\triangle ABC$ and $\triangle DEF$ is enough to determine if the triangles are similar?

A $\angle A$, $\angle B$ and $\angle E$
B AB, BC, DE, and EF
C $\angle A$, AB, AC, $\angle F$, DE, and DF
D $\angle A$, AB, AC, $\angle D$, DE, and DF

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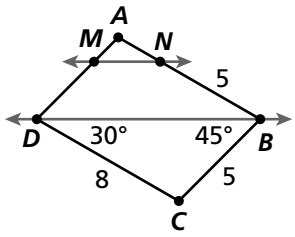
Use the figure below to answer questions 7–10. *ABCD* is a parallelogram. Lines *MN* and *DB* are parallel.



7. Triangles *ABD* and *CDB* are congruent. Which side is congruent to $\overline{DC}$?

A $\overline{CB}$

B $\overline{DA}$

C $\overline{AB}$

D $\overline{DB}$

8. Triangles *ABD* and *CDB* are congruent. What is the measure of $\angle A$?

A 30°

B 45°

C 75°

D 105°

9. Triangles *ANM* and *ABD* are similar. What is the ratio of *AB* to *AN*?

A 5 to 3

B 5 to 8

C 8 to 5

D 8 to 3

10. Which side length CANNOT be found from the information in the figure?

A *MN*

B *MA*

C *AN*

D *AD*

11. Which of the following is always true?

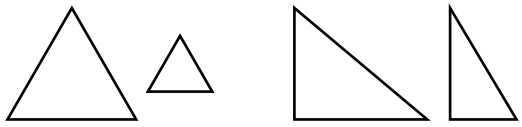
A Two similar triangles are congruent.

B Two congruent triangles are similar.

C Two triangles with the same area are congruent.

D Two triangles with the same area are proportional.

12. Which pair of triangles are similar?



A the pair on the left

B the pair on the right

C both pairs

D neither pair

13. Which of the following statements about similar triangles is NOT true?

A All equilateral triangles are similar to each other.

B All right, isosceles triangles are similar to each other.

C All 30°-60°-90° triangles are similar to each other.

D All scalene triangles are similar to each other.

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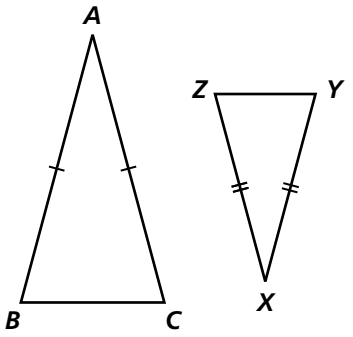
Use the figure below to answer questions 14–16. Triangles *ABC* and *XYZ* are similar, isosceles triangles.



14. Which of the following is true?

A $\frac{AB}{XZ} = \frac{AC}{ZY}$

B $\frac{AB}{YZ} = \frac{AC}{YX}$

C $\frac{AB}{AC} = \frac{XY}{XZ}$

D $\frac{AB}{AC} = \frac{XY}{YZ}$

15. If $AB = 12$ cm and the ratio of corresponding sides is 3 : 1, what is XZ?

A 4 cm

B 1 cm

C 3 cm

D There is not enough information to solve the problem.

16. If $m\angle A = 44°$, what is $m\angle Z$?

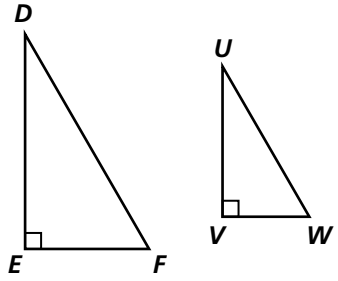
A 60°

B 44°

C 68°

D There is not enough information to solve the problem.

Use the figure below to answer questions 17–19. Triangles *DEF* and *UVW* are right triangles.



17. What would have to be true for triangles DEF and UVW to be similar?

A $\angle D = \angle V$

B $\angle F = \angle W$

C $DF = UW$

D $DE = EF$

18. If $\angle D = \angle W$, which statement is true?

A $\angle D = \angle V$

B $\angle F = \angle U$

C The triangles are congruent.

D The triangles cannot be similar.

19. If $DE = VW$, which statement is true?

A The triangles cannot be similar.

B The triangles have a scale factor of 2.

C The triangles are congruent only if $EF = UV$.

D The corresponding angles must be congruent.

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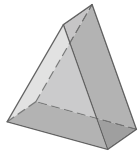
GEOMETRY

Three-Dimensional Figures

M7G4.a Describe three-dimensional figures formed by translations and rotations of plane figures through space. Also M7G4.b

Select the best answer for each question.

1. What polygons form the lateral faces of the prism?



A triangles
B trapezoids
C rectangles
D squares

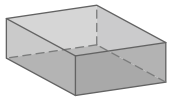
2. Which three-dimensional figure CANNOT have parallel faces?

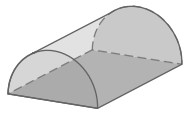
A cube
B pyramid
C prism
D cylinder

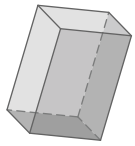
3. Which is a cross-section of a basketball?

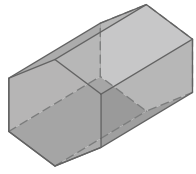
A ellipse
B square
C circle
D triangle

4. In an oblique prism, the lateral surfaces do not all form right angles with the bases. Which three-dimensional figure is oblique?

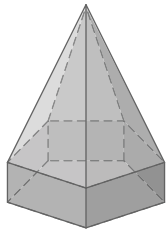
A


B


C


D


5. How many faces does this three-dimensional figure have?



A 10 **B** 11
C 12 **D** 15

6. Which of the following three-dimensional figures has a polygon as its base?

A sphere
B cylinder
C cone
D pyramid

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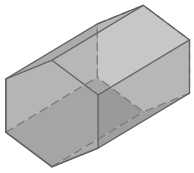
Use the figure below to answer questions 7–9.



7. How many faces of the figure are NOT rectangles?

A 4
B 6
C 2
D 8

8. How many sides does the base of the figure have?

A 2
B 4
C 6
D 8

9. How many pairs of parallel faces does the figure have?

A 3
B 4
C 5
D 6

10. Which three-dimensional figure has NO congruent angles?

A sphere
B triangular pyramid
C triangular prism
D cone

11. A triangular prism has five faces; two are triangles, and the other three are rectangles. If the three rectangular faces are congruent to each other, what type of triangle are the two triangular faces?

A acute triangle
B right triangle
C isosceles triangle
D equilateral triangle

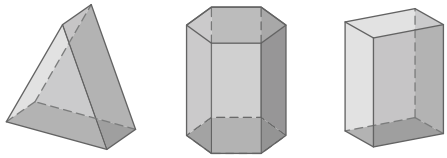
12. Which of the following shapes is related to a cylinder?

A triangle
B circle
C trapezoid
D rhombus

13. What shape would you use to model a volcano?

A cylinder
B sphere
C cube
D cone

14. The base of a prism is a polygon with n sides. Which expression equals the number of faces in this prism?



A $2 + n$
B $2 \cdot (n + 1)$
C $2 \cdot n$
D $2 \cdot (n - 1)$

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15. Which characteristic of a cylinder and a cone is the same in both?

A number of vertices
B number of faces
C shape of bases
D number of right angles

16. Which of the following statements is always true?

A A triangular prism always has an equilateral triangle as its base.
B A rectangular prism has only right angles.
C A cone has no vertex.
D A cylinder has no congruent faces.

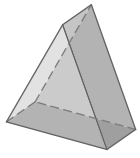
17. Which of the following three-dimensional figures has the greatest number of pairs of congruent faces?

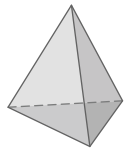
A cone
B cylinder
C rectangular prism
D sphere

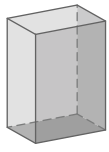
18. Which of the following statements is false?

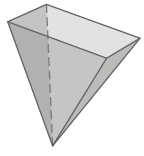
A A pyramid never has perpendicular faces.
B A pyramid always has parallel faces.
C A prism always has parallel faces.
D A prism has perpendicular faces.

19. Which three-dimensional figure has NO triangular faces?

A 

B 

C 

D 

Name_____ Date _____ Class_____

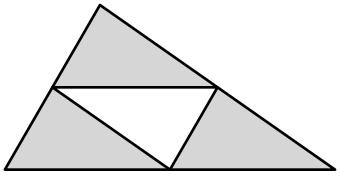
GEOMETRY

Transformations

M7G2.a Demonstrate understanding of translations, dilations, rotations, reflections, and relate symmetry to appropriate transformations.

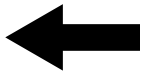
Select the best answer for each question.

1. What transformation will make the gray triangle at the top coincide with the white triangle in the center?



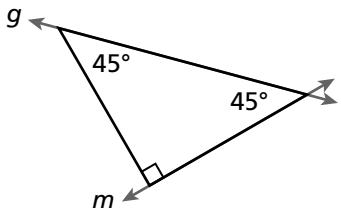
A translation down
B 180° rotation
C 90° rotation clockwise
D reflection across horizontal line

2. In what direction will this arrow point after it is rotated 270° counterclockwise?



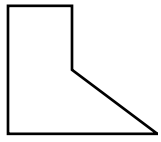
A right **B** left
C up **D** down

3. What new figure do you get if you reflect the right triangle across the hypotenuse and the original figure remains the same?

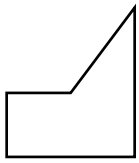


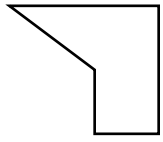
A square
B parallelogram
C rectangle
D right triangle

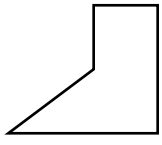
Use the figure below to answer questions 4–6.

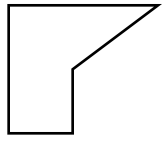


4. What does the figure look like after a reflection across a horizontal line?

A


B


C


D


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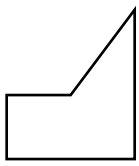
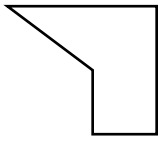
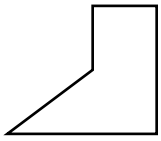
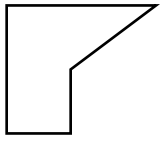
5. Under which transformation will the figure look the same?

A 90° rotation counterclockwise
B 180° rotation
C any translation
D 90° rotation clockwise

6. What does the figure look like after a 180° rotation counterclockwise?

A 
B 
C 
D 

Use the picture below to answer questions 7–10.

7. Which transformation gives an upside down mirror image of the plant?

A translation left
B reflection in a horizontal line
C dilation
D 90° rotation clockwise

8. Identify the transformation that will make the plant lie on its side.

A reflection in a horizontal line
B translation right
C reflection in a vertical line
D 90° rotation counterclockwise

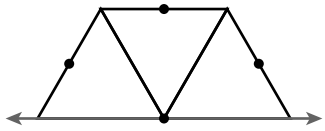
9. Which transformation will turn the flower's pot into a symmetrical shape?

A reflection across a vertical line
B 180° rotation
C reflection across a diagonal line
D translation

10. Find the transformation that created the left flower of the plant.

A reflection across a vertical line
B dilation and translation right
C 180° rotation and translation right
D None of the above.

Use the figure below to answer questions 11–13.



11. Joseph made a design by reflecting the figure across a horizontal line. How many lines of symmetry does the design have?

A 1
B 2
C 6
D 10

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12. After which translation will the design look the same?

A 180° rotation
B dilation
C 90° rotation
D reflection

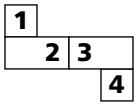
13. By how many degrees can the design be rotated and look the same?

A 30°
B 60°
C 90°
D 150°

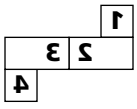
14. A design is made by combining a figure with its transformation image. For which transformation is the design always symmetrical?

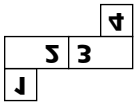
A 90° rotation clockwise
B dilation by 2
C reflection across vertical line
D translation

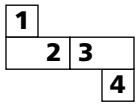
Use the figure below to answer questions 15 and 16.

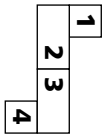


15. What does the figure look like after a 90° rotation clockwise?

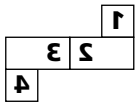
A


B


C


D


16. Which transformation created this shape from the original shape?

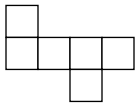


A reflection across a horizontal line
B translation left
C reflection across a vertical line
D 180° rotation

17. Kristin has a square with dimensions 3 cm by 3 cm. If she doubles the dimensions of her square, by what factor does she increase the area of her square?

A 2 **B** 4
C 6 **D** 8

18. Jimmy creates a net of a cube.



He rotates it 90° clockwise, then reflects it across a horizontal line, and rotates it another 180° clockwise. What is another set of transformations that Jimmy could have done to get to same final shape?

A reflect across a vertical line, then translate 2 units down, and then rotate 90° clockwise
B rotate 90° counterclockwise and then reflect across a horizontal line
C rotate 270° clockwise, then reflect across a horizontal line, and then rotate 60° counterclockwise.
D rotate 90° clockwise and then reflect across a vertical line

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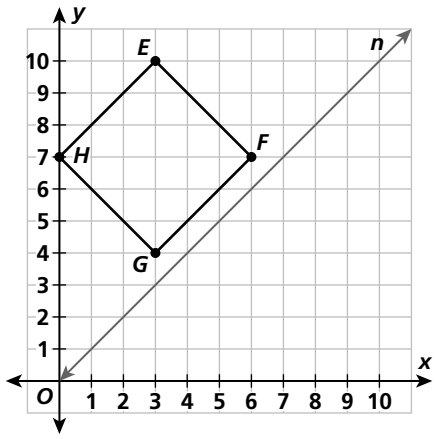
GEOMETRY

Transformations in the Coordinate Plane

M7G2.b Given a figure in coordinate plane, determine the coordinates resulting from a translation, dilation, rotation, or reflection.

Select the best answer for each question.

Use the figure below to answer questions 1–5.



1. What are the coordinates of point *G′* after a translation 3 units to the right and 5 units up?

A (5, 8) **B** (8, 7)
C (9, 6) **D** (6, 9)

2. What are the coordinates of point *H′* after a 90° clockwise rotation about the center of the square?

A (3, 7) **B** (3, 10)
C (6, 7) **D** (7, 0)

3. After an enlargement, point *F′* was at (8, 7) and point *G′* was at (3, 2). By what scale factor was the square enlarged?

A 2 **B** $\frac{4}{3}$
C $\frac{5}{3}$ **D** 4

4. The square is reflected across line *n*. What are the coordinates of point *E*?

A (6, 5)
B (10, 3)
C (9, 4)
D (10, 4)

5. Which set of transformations will result in the same position of the square as a reflection across line *n*?

A translate down 4 units and right 4 units
B reflect across the *x*-axis, translate up 8 units and right 4 units
C translate down 4 units, reflect across the vertical line $x = 4$
D reflect across the *x*-axis, translate up 10 units and right 6 units

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6. A 2 unit by 2 unit square centered at the origin is enlarged by a scale factor of 3. What are the coordinates of the vertices of the image?

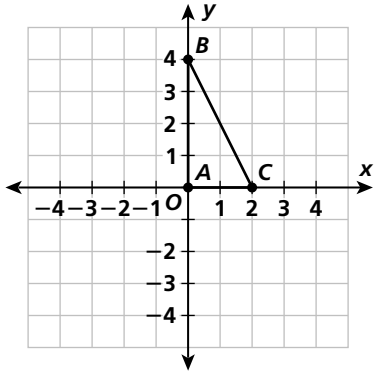
A (6, 6), (−6, 6), (−6, −6), (6, −6)

B (5, 5), (−5, 5), (−5, −5), (5, −5)

C (4, 4), (−4, 4), (−4, −4), (4, −4)

D (3, 3), (−3, 3), (−3, −3), (3, −3)

Use the figure below to answer questions 7–9.



7. Triangle *ABC* was reflected across the *y*-axis, and then triangle *CBC′* was reflected across the *x*-axis. What are the coordinates of the figure *CBC′B″*?

A (0, 2), (4, 0), (0, −2), (−4, 0)

B (2, 0), (0, 4), (−2, 0), (0, −4)

C (2, 0), (0, 0), (−2, 0), (0, −2)

D (4, 0), (0, 0), (−4, 0), (0, 2)

8. Triangle *ABC* was translated down 3 units, reflected across the *x*-axis, and then rotated 90° counterclockwise about the image of point *B′*. What are the coordinates of points *A′* and *C′*?

A *A*(4, −1), *C*(4, 1)

B *A*(−4, 1), *C*(−4, −1)

C *A*(0, −1), *C*(0, 1)

D *A*(−4, −1), *C*(−4, 1)

9. Josephine added a line to the grid which passes through points (0, 0), and (2, 2). She then reflected the triangle across the line. Which other set of transformations will result in the same location of the triangle?

A rotate 270° clockwise about *C* and reflect it across the *y*-axis

B rotate 90° counterclockwise about A and reflect across the *x*-axis

C translate down 2 units and reflect across the *x*-axis

D rotate 270° clockwise about *A* and reflect across the *y*-axis

10. In a chess game, a knight's move is 2 units in one direction and 1 unit in a perpendicular direction. If a knight starts at the origin and makes one move, which could it NOT be its location?

A (−1, −2)

B (1, 2)

C (2, −1)

D (−2, 2)

11. Which set of transformations returns a given figure to its original location?

A translation 2 units left, then 3 units up, then 3 units right, then 2 units down

B reflection across the *y*-axis, then the *x*-axis, then the *y*-axis, and then the *x*-axis

C 180° counterclockwise rotation

D 90° clockwise rotation, then reflection across the line $y = x$

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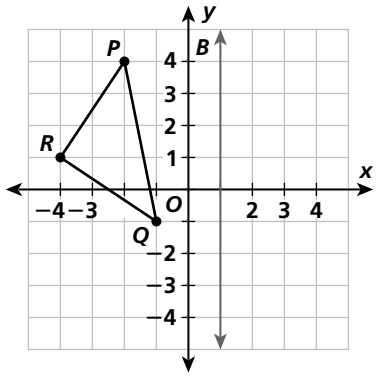
Use the figure below to answer questions 12–15.



12. Which translation will move point *P* to the location (2, −2)?

A right 2, down 2

B left 6, down 4

C right 4, down 6

D left 4, down 6

13. Where will point *Q′* be after a reflection across the vertical line $x = 1$ and a translation 3 units down?

A (3, −4) **B** (1, −4)

C (−1, −3) **D** (3, −1)

14. What is the *y*-coordinate of point *R′* after a 90° clockwise rotation about point *Q*?

A 3 **B** 2

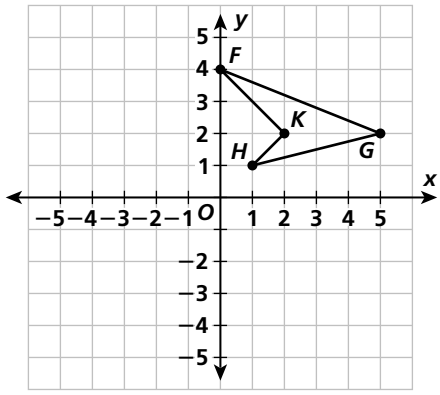
C 1 **D** −2

15. Triangle *PQR* is dilated about center *R* with a scale factor of 2. What are the coordinates of Q′?

A (1, −2) **B** (0, −2)

C (2, −3) **D** (1, −3)

Use the figure below to answer questions 16–18.



16. The quadrilateral is reflected across the *y*-axis. What is the *x*-coordinate of point *K′*?

A 0 **B** −1

C −2 **D** −3

17. What are the coordinates of point *F′* after a 90° counterclockwise rotation about the origin?

A (4, 0) **B** (−4, 0)

C (0, −4) **D** (0, 4)

18. What is the *y*-coordinate of point *H′* after a translation 3 units left, and 4 units up and a reflection across the *x*-axis?

A −5

B 5

C −1

D 1

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ALGEBRA

Algebraic Expressions

M7A1.a Translate verbal phrases to algebraic expressions. Also M7A1.b

Select the best answer for each question.

1. Jesse saved $\$s$ toward the purchase of a $150 CD player. Which expression describes how much more he needs to save?

A $150 + s$

B $\frac{150}{s}$

C $150 \cdot s$

D $150 - s$

2. Which situation can be modeled by the expression $2.5x$?

A A copier prints x pages per hour. How many pages can it print in 2.5 hours?

B Theo has x pounds of cookies with which to make 2.5-pound boxes. How many boxes of cookies can Theo put together?

C A car travels x miles in 2.5 hours. At what speed is the car traveling?

D After dishing out 2.5 pounds of nuts from a bin, x pounds of nuts remain. How many pounds did the bin originally contain?

3. Which expression can be used to find the quotient of 3 and an unknown number?

A $n + 3$

B $3 \div n$

C $n - 3$

D $3 \cdot n$

4. What is the value of $2x + 6y$ when $x = 7.1$ and $y = 8.4$?

A 22.6

B 57.5

C 59.4

D 64.6

5. Look at the input-output table. Which is an expression for y in terms of x?

Input (x)	Output (y)
45	65
65	85
85	105

A $65 - x$

B $\left(\frac{1}{5}\right)x + 56$

C $x + 20$

D $45 - x$

6. A pet store manager had 80 goldfish in stock. She bought g more goldfish. Which expression can be used to model the number of goldfish she has now?

A $g - 80$

B $80 + g$

C $80g$

D $80 - g$

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7. Which situation can be modeled by the expression $20 - x$?

A Helena bicycled x miles from her house to Kendra's house, then 20 miles to Ezra's house. How far did she bicycle in all?

B Jill cut a 20-inch piece of ribbon into x smaller pieces. How long was each smaller piece of ribbon?

C David bought a notebook for $\$x$. How much would 20 of them cost?

D Alfredo bought a belt for $\$x$. How much change will he get from $20.00?

8. Carla is collecting rainwater in a rain barrel. Currently she has 18 inches of water in the barrel. If rain is falling at a rate of 1.5 inches per hour, which expression can be used to model the number of inches of rain in the barrel after h hours?

A $1.5h + 18$

B $18 - 1.5h$

C $1.5 + 18h$

D $(1.5 + 18)h$

9. What is the value of the expression $3x^2 + 5y$ when $x = 4$ and $y = 3$?

A 27

B 38

C 63

D 159

10. There are 90 students in the seventh-grade class. Two-thirds of them went on a field trip. Which expression can be used to model the number of students that went on the field trip?

A $\left(\frac{2}{3}\right) + 90$

B $\left(\frac{2}{3}\right) \cdot 90$

C $90 - \left(\frac{2}{3}\right)$

D $90 \div \left(\frac{2}{3}\right)$

11. What is the value of the following expression when $y = 7$?

$$4 - 2y$$

A -5

B -7

C 28

D -10

12. Which expression is equivalent to $24x$?

A $2^2 \cdot 6x + 8x - 6$

B $22x + 6x \cdot 3^2 \div 27$

C $15(5x - 3) - 12x$

D $12x + 3 \cdot 10x \div 2$

13. Which of the following correctly uses the order of operations?

A $6 + 6^2 \cdot 3 - 4 = -144$

B $12 \div 8 \cdot 30 - 10 = 35$

C $1 + 6 \cdot 3^3 - 18 = 171$

D $(5 - 3)^2 - 3^2 + 5^2 = 36$

Name_____ Date _____ Class_____

14. Simplify the expression below.

$$3a(8 - 5)^2$$

A $27a$

B $12a$

C $24a - 25$

D $9a^2$

15. Anne is 2 years older than Beth, who is twice as old as Christine. If Christine is c years old, which expression represents Anne's age?

A $c - 2$

B $2c - 2$

C $2 + 2c$

D $2 + c$

16. Mr. Lyle has $9,000 in the bank. If he deposits $100 per week, which expression represents his balance in dollars after w weeks?

A $9{,}000w + 100$

B $w(9{,}000 + 100)$

C $100(w + 9{,}000)$

D $9{,}000 + 100w$

17. At 10:00 A.M. the temperature was 52° F. For the next 3 hours, the temperature went up x° F per hour. Which expression represents the temperature in degrees Fahrenheit at 1:00 P.M.?

A $52 + 3x$

B $52 - 3x$

C $52 = 3x$

D $(52 + x)3$

18. Andrew collects comic books. The number of books in his collection at m months since he started is $40 + 7$m. How many comic books will Andrew have when $m = 24$?

A 64

B 71

C 208

D 304

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ALGEBRA

Add and Subtract Algebraic Expressions

M7A1.c Add and subtract linear expressions, simplify using order of operations, include application problems, using commutative, associative, and distributive properties as needed.

Select the best answer for each question.

1. Which expression is equivalent to

$$4(-5 + 3)^2 + (7 - 3)^3?$$

A -13
B 80
C 72
D 20

2. Which expression is equivalent to

$$18k^3 - 27k^2?$$

A $(9k^2 - 3k^3) + (27k^2 - 30k^3)$
B $(9k^2 - 3k^3) - (27k^2 - 30k^3)$
C $-(9k^2 - 3k^3) - (27k^2 - 30k^3)$
D $-(9k^3 - 3k^2) + (27k^3 - 30k^2)$

3. Simplify the expression below.

$$14x - 2y + 7x - 3y + (-3x)$$

A $19x$
B $4x - 5y$
C $13xy$
D $18x - 5y$

4. Add.

$$(3x^2 + 2x) + (x^2 - 6x) =$$

A $2x^2 + 4x$
B $2x^2 + 8x$
C $4x^2 - 4x$
D $4x^2 - 2x$

5. Simplify the expression below.

$$3a + 6b - 7a + (-3b) + 9c$$

A $8abc$
B $4a - 3b + 9c$
C $8 + abc$
D $-4a + 3b + 9c$

6. Which expression is equivalent to

$$52r^3 - 16r^5 - 36r^2?$$

A $(52r^3 - 16r^5) - 36r^2$
B $52r^3 - (16r^5 - 36r^2)$
C $-52r^3 - (16r^5 + 36r^2)$
D $-52r^3 + (-16r^5 - 36r^2)$

7. If $(3x + 2y)^2 - 3$ is 22, what is the value of $(3x + 2y)^2 + 3$?

A 22
B 25
C 28
D not enough information to answer

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8. The surface area of a cylinder is the sum of the areas of the two circular bases and the lateral surface. Each base of a cylinder has an area of $2x^2 - y^2$, and the area of its lateral surface is $5y^2$. Which expression represents the surface area of this cylinder?

A $4x^2 + 3y^2$
B $4x^2 + 4y^2$
C $2x^2 + 4y^2$
D $2x^2 - 6y^2$

9. What is the name of the property that is used in the following equation?

$$(a + b) + c = a + (b + c)$$

A distributive property
B associative property
C commutative property
D identity property

10. Which is an example of the Distributive Property?

A $(25 + 10) + 31 = 25 + (10 + 31)$
B $25 \cdot 10 + 31 = 31 + 25 \cdot 10$
C $25 \cdot (10 + 31) = 25 \cdot 10 + 25 \cdot 31$
D $(25 + 10) + 31 = 25 + 10 + 31$

11. Rectangle A has a length of $3 + m$ and a width of $2m - 10$. Which of the following expressions can be used to represent its perimeter?

A $3m - 7$
B $6m - 4$
C $3m - 2$
D $6m - 14$

12. Ella has 10 more CDs than her friend Krystal has. Iris has 3 times as many CDs as Ella has. Which of the following expressions can be used to show how many CDs the three have in total if Krystal has k CDs?

A $10 + 3k$
B $40 + 5k$
C $40 + 3k$
D $10 + 5k$

13. A triangle has side lengths $(x + 1)$ inches, $(3x - 2)$ inches, and $4x$ inches. What is the perimeter of the triangle?

A $(8x - 1)$ inches
B $(3x + 3)$ inches
C $(x + 4)$ inches
D $(9x)$ inches

14. What is the value of the following expression if $x = \frac{1}{3}$ and $y = 2$?

$$(3x + 6y) - (9x - 7y)$$

A -4
B 2
C 24
D 30

15. Add.

$$\begin{array}{r} 17m + 4n - 12p \\ +\ 9m - 4n + 18p \\ \hline \end{array}$$

A $8m + 8n - 6p$
B $26m + 8n + 6p$
C $8m - 6p$
D $26m + 6p$

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16. Jack and Eric both plan to fence their yards. Jack's yard is a square with a side length of x meters. Eric's yard is a rectangle with dimensions $(x + 2)$ meters by $(x - 2)$ meters. If the material that they use to build the fences costs the same amount per meter, who will pay more for fencing his yard?

A Jack

B Eric

C They will pay the same.

D There is not enough information to answer.

17 Which is equivalent to the given expression?

$$4(m + 3)^2 - (m + 3)^2$$

A $3(m + 3)$

B $3(m + 3)^2$

C $3m^2$

D $3m^2 + 27$

18. Subtract.

$$\begin{array}{r} 12r + 5s + 8t \\ \underline{-(3r + \ \ s - 6t)} \end{array}$$

A $9r + 4s + 14t$

B $9r + 4s + 2t$

C $9r + 6s - 14t$

D $9r + 6s - 2t$

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ALGEBRA

Direct and Inverse Variation

M7A1.d Describe patterns in the graphs of proportional relationships, both direct ($y = kx$) and inverse ($y = \frac{k}{x}$).

Select the best answer for each question.

1. Which equation does NOT represent a direct variation?

A $y = 3x$

B $2y + x = 0$

C $3x = -4y$

D $3y = 4x + 1$

2. Which set of data does NOT represent an inverse variation?

A

x	*y*
1	8
4	2
2	4

C

x	*y*
6	9
9	13.5
3	4.5

B

x	*y*
3	−6
−2	9
−6	3

D

x	*y*
−6	4
3	−8
12	−2

3. Which equation represents an inverse variation?

A $3x = 2y$

B $2 - 2x + y = 0$

C $y^2 = x$

D $xy = 5$

4. Which set of data does NOT represent a direct variation?

A

x	*y*
10	12
5	7
2	4

C

x	*y*
3	−6
−1	2
−4	8

B

x	*y*
6	13.2
9	19.8
17	37.4

D

x	*y*
−6	4
3	−2
12	−8

5. Which of the following equations has a different constant of proportionality than the other three?

A $2x + y = 0$

B $y = 2x$

C $2y - 4x = 0$

D $x = \frac{1}{2}y$

6. Determine the constant of variation if y varies inversely as x and $y = 2$ when $x = 7$.

A $\frac{2}{7}$

B $\frac{7}{2}$

C 3.5

D 14

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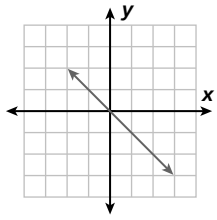
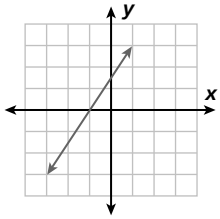
7. Louis charges $8 per hour for baby-sitting. The amount of money he makes varies directly with the number of hours he baby-sits. The equation $y = 8x$ tells how much she earns y for baby-sitting x hours. Which graph can be used to represent the equation?

A



C



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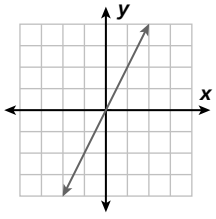

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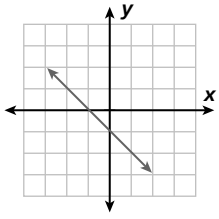


8. Andrew walks to school every day. The distance between his home and school is 1000 m, and it takes Andrew 20 minutes to walk there. Which equation relates the distance d to time t if Andrew is walking at a constant speed?

A $d = 20t$

B $d = 5t$

C $d = 50t$

D There is not enough information to answer.

9. A car is traveling at a constant speed. After 3 hours, the car has traveled 180 miles. If the car continues to travel at the same constant speed for another 2 hours, how much further has it traveled?

A 180 miles

B 60 miles

C 120 miles

D none of the above

10. Which statement is false?

A The graph of a direct variation always passes through the origin.

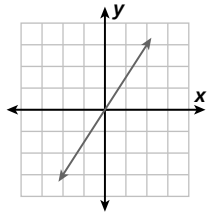
B The graph of an inverse variation never passes through the origin.

C The graph of a direct variation is always a straight line.

D The graph of an inverse variation is always a straight line.

11. Which graph represents an inverse variation?

A



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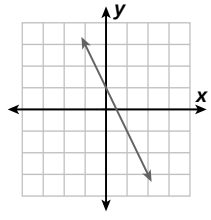

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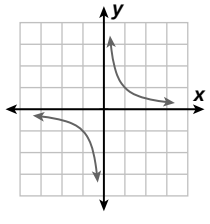

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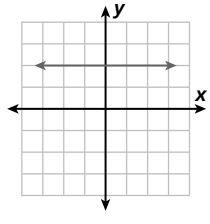

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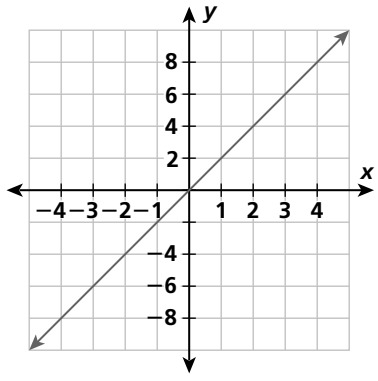
12. The value of y varies directly with x, and $y = -8$ when $x = 2$. What is the value of y when $x = 1$?

A -16 **C** -4

B 16 **D** 4

Use the following graph to answer questions 13–15.



13. What is the name of the relationship that is represented by the above graph?

A direct variation

B inverse variation

C nonlinear

D exponential

14. Suppose the graph passes through point (3, 6). Which is the equation of the graph?

A $y = 18$ **C** $y = \frac{2x}{x}$

B $y = 3x$ **D** $y = \frac{2}{x}$

15. Which of the following ordered pairs could NOT be a point on the graph?

A (1.5, 3)

B (6, 3)

C (−4, −8)

D $\left(\frac{1}{2}, 1\right)$

16. The number of CDs Jenny can afford to buy varies inversely as the price of each CD. If Jenny can afford 3 CDs priced at $15 each, what must the price of a CD be in order for Jenny to purchase 5 of them?

A $9

B $25

C $12

D $3

17. If y varies inversely as x, what is the value of x when $y = 18$?

x	y
9	4
6	6
?	18

A 18

B 40.5

C 2

D −2

18. Eva and Anne buy pencils from different office supply stores. The cost of pencils at Business Outlet is given by $y = 0.10x$. If a dozen pencils at Office Supply costs 24 cents more than at Business Outlet, which equation gives the cost of pencils at Office Supply?

A $y = 0.12x$

B $y = 0.24x$

C $y = \frac{0.12}{x}$

D $y = \frac{0.24}{x}$

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ALGEBRA

Patterns, Sequences, and Functions

M7A3.b. Represent, describe, and analyze relations from tables, graphs, and formulas.

Select the best answer for each question.

1. Mona is saving money for college. Each week she doubles the amount of her deposit. If her first deposit is $5.00, how much money will Mona have in her account after her sixth deposit?

A $30.00
B $160.00
C $230.00
D $315.00

2. What is the next term in the following sequence?

1, 1, 2, 3, 5, 8, 13, …

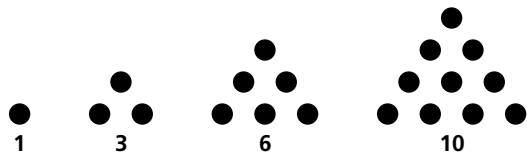
A 15
B 17
C 21
D 23

3. Which value is the missing number in the sequence?

77.5, 82, 86.5, ____, 95.5, 100 ...

A 90
B 90.5
C 91
D 91.5

4. The numbers represented below are called triangular numbers.



What is the number of circles in the next figure in the pattern?

A 11
B 14
C 15
D 16

5. The table shows the relationship between a circle's diameter in inches and its circumference in inches, rounded to the nearest hundredth.

Diameter (in.)	4	5	6	7
Circumference (in.)	12.56	15.70	18.84	?

What is the circumference of a circle with a diameter of 7 inches, rounded to the nearest hundredth?

A 21.70 inches
B 21.98 inches
C 22.56 inches
D 43.96 inches

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6. Which value is the missing number in the sequence?

50, 48, 52, ____, 54, 44, ...

A 46
B 48
C 50
D 52

7. Identify the best rule for this pattern.

3, 9, 27, 81, 243...

A The numbers are increasing by 6.
B The numbers are increasing by 18.
C The numbers are doubling.
D The numbers are tripling.

8. Use the following pattern to find the units digit of 2^{10}.

2^1	2^2	2^3	2^4	2^5	2^6
2	4	8	16	32	64

A 2
B 4
C 6
D 8

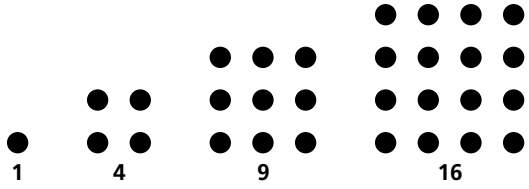
9. The Fibonacci sequence is as follows: 1, 1, 2, 3, 5, 8, 13, … If t_n is the n^{th} term, which is the rule for t_n?

A $t_n = t_{n-2} + t_{n-3}$
B $t_n = t_{n-1} + t_{n+1}$
C $t_n = t_{n-2} - t_{n-1}$
D $t_n = t_{n-1} + t_{n-2}$

10. Ana borrowed money from a friend. She agreed to pay her friend back \$1.00 the first week, and \$0.50 more per week afterward. How much will Ana pay her friend the fourth week?

A \$3.00
B \$1.75
C \$2.00
D \$2.50

11. The numbers represented below are called square numbers.



What is the next number in the pattern?

A 25
B 29
C 36
D 41

12. Which rule gives the number of circles in the figure for each value of *n*?

n	1	2	3
Figure	• / •• / ••	• / ••• / •••• / ••	••• / ••••• / ••••• / ••••

A Square *n*, then add 1.
B Multiply *n* by 5.
C Square $n + 1$, then add 1.
D Square *n*, then add 4.

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13. Which pattern matches the following rule?

> Each number is 1 less than 3 times the previous number.

A 3, 8, 25, 74
B 2, 5, 14, 45
C 1, 2, 5, 8
D 4, 11, 32, 95

14. Nursery rhymes often contain riddles, like this one here:

"As I was going to St Ives
I met a man with seven wives
And every wife had seven sacks
And every sack had seven cats
And every cat had seven kits
Kits, cats, sacks, wives
How many were going to St Ives?"

If every kit had seven toys, how many toys would there be?

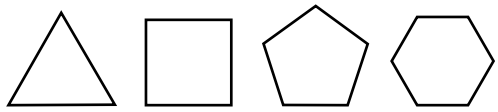
A 2,401
B 16,807
C 117,649
D 19,607

15. Look at the input-output table. What is the rule for this table?

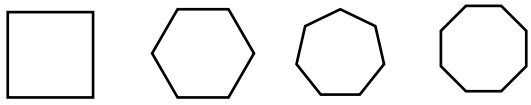
Input	Output
6	10
3	22
−5	54

A $y = x + 4$
B $y = 3x + 13$
C $y = -4x + 34$
D $y = -8x + 41$

16. Which shape comes next in this pattern?



A **B** **C** **D**



17. Achilles is running a race against a turtle. He allows the turtle to have a 10 meter head start. The positions of Achilles and the turtle are as follows:

Time (seconds)	0	1	2	3	4	5
Turtle's lead on Achilles (meters)	10	5	2.5	1.25	0.625	?

How far ahead of Achilles is the turtle at 5 seconds?

A 0.3125 meters
B 0.624 meters
C 1 meters
D 0 meters

18. Which pattern matches the following rule?

> Each number is 2 more than 2 times the previous number.

A 0, 2, 6, 14
B 1, 4, 10, 26
C 2, 6, 14, 26
D 1, 4, 8, 16

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ALGEBRA

Relations and Functions

M7A3.c Describe how change in one variable affects the other variable.

Select the best answer for each question.

1. Shauna deposits the same amount into her bank each week. The table shows her balance over four weeks.

Week 1	Week 2	Week 3	Week 4
$13.50	$27.00	$40.50	$54.00

Which equation describes her balance d in dollars at week w?

A $d = 13.5w$

B $d = w + 13.5$

C $\frac{w}{d} = 13.5$

D $d = 54 - w$

2. A school expects to have 160 seventh-grade students next year. Which describes the relationship of the number of students per teacher y to the number of teachers x?

A $y = 160 - x$ **C** $y = \frac{x}{160}$

B $y = 160x$ **D** $y = \frac{160}{x}$

3. A person who weighs 100 pounds on Earth would weigh about 16.6 pounds on the moon. Which relates Earth weight e to Moon weight m?

A $100e = 16.6m$

B $e = 16.6m$

C $100m = 16.6e$

D $m = 16.6e$

4. Danny decides to go rollerblading down a nearby hill. Which variables are related to each other?

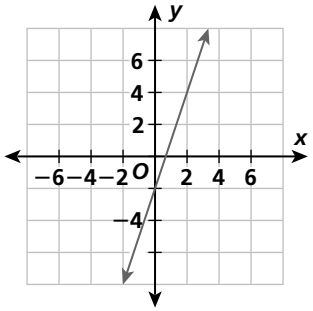
A the height of the hill and the temperature

B Danny's speed and the height of hill

C the wind strength and Danny's height

D the gravitational pull and the wind strength

5.



Which equation could represent the line shown?

A $y = 2x - 3$ **C** $y = 3 - 2x$

B $y = x - 2$ **D** $y = 3x - 2$

6. Tom and Joe want to share a bag of candy. Tom starts with 10 pieces of candy, and then Joe gets 3 for every additional piece of candy that Tom gets. Which statement is NOT true?

A Tom's amount of candy depends on Joe's amount of candy.

B Joe's amount of candy depends on Tom's amount of candy.

C Tom's amount of candy depends on the original amount of candy.

D Joe's amount of candy depends on the original amount of candy.

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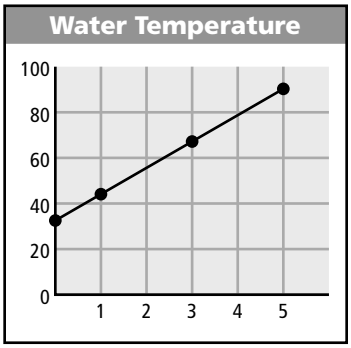
7. Jack is heating water on the stove. He recorded the temperature of water at various times. Which graph describes the data?

time (min)	0	1	3	5
Temp (°C)	34.3°	46.4°	70.6°	94.8°

A



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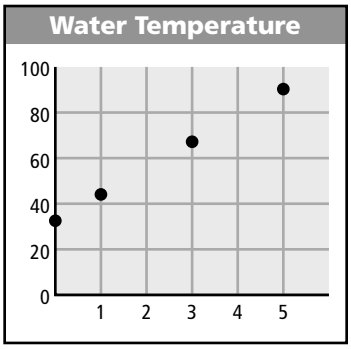

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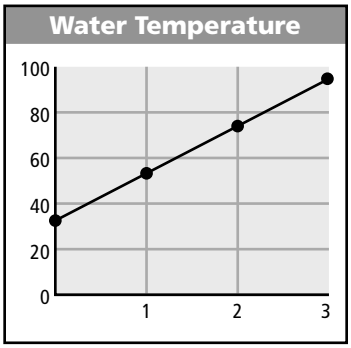
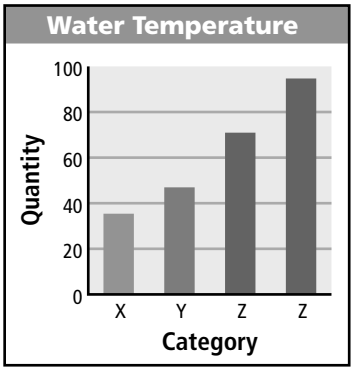


D



8. Elaine is borrowing $750 for 1 year. The loan company charges 8.5% yearly interest. Which formula can be used to find the interest Elaine will owe?

A $I = 750 \cdot 8.5 \cdot 365$

B $I = 750 \cdot 0.85 \cdot 1$

C $I = 750 \cdot 0.085 \cdot 1$

D $I = 750 + 0.085 \cdot 750 \cdot 1$

9. Chris does freelance work as a graphic artist. He charges a set-up fee of $17.00, plus $10.00 per hour. Which function describes the cost c for a job that takes Chris h hours?

A $c = (17 + 10)h$

B $c = 10h + 17$

C $c = 17h + 10$

D $c = 27h + 10$

10. Which equation describes the relationship of the x values in the table to the y values?

x	3	4	5	6
y	6	13	22	33

A $y = 2x + 1$

B $y = 4x - 6$

C $y = 11(x - 3)$

D $y = x^2 - 3$

11. Kareem is using the following scale to make a drawing of a house he wants to build.

1 inch = 35 feet

Which equation relates a length in the drawing d to the corresponding length in the actual house h?

A $35d = h$

B $h = \frac{35}{d}$

C $d = 35h$

D $h = \frac{d}{35}$

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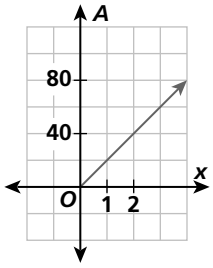
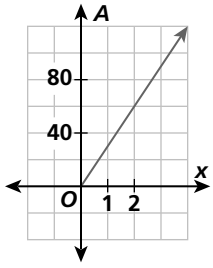
12. Jeremy is building a rectangular patio with a length of 30 feet and a width of x feet. Which graph shows the relationship between the width x and the area A of the patio?

A



C



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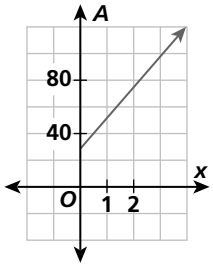

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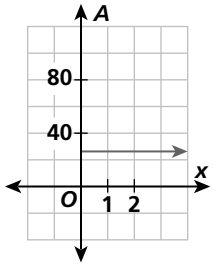


13. An electrician charges customers $52 per hour plus an additional $11 for travel each way. If h represents the number of hours worked, which of the following equations could be used to calculate the electrician's total charge c?

A $c = (52 \cdot h) + 22$

B $c = 52 \cdot 11 \cdot h$

C $c = (52 \cdot 2) + (11 \cdot h)$

D $c = (52 \cdot 11) + (h \cdot 2)$

14. Monique is lending her brother Michael $75 for 3 months. She is charging him a yearly interest rate, r. At the end of the 3 months, Michael owes Monique $3.75 in interest. Which formula can be used to find the interest rate of the loan?

A $75 = 3.75 \cdot r \cdot 0.25$

B $3.75 = 75 \cdot r \cdot 0.25$

C $r = \dfrac{3.75}{75}$

D $3.75 = 75 \cdot r \cdot 0.5$

15. Which equation could you solve to find the value of x in the proportion $\frac{3}{8} = \frac{x}{136}$?

A $3x = 8 \cdot 136$

B $3x = 3 \cdot 136$

C $3 \cdot 136 = 8x$

D $3 \cdot 8 = 136x$

16. Donna is knitting a scarf. She needs 36 yards of yarn for the original pattern, plus an additional yard for every inch that she wants to lengthen the scarf. Describe how the amount of yarn needed changes as the scarf gets longer.

A The amount doubles for every extra inch.

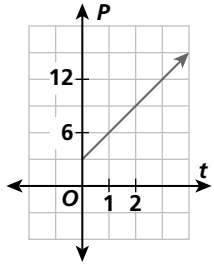
B The amount increases by 1 yard for every extra inch.

C The amount increases by 1 inch for every extra inch.

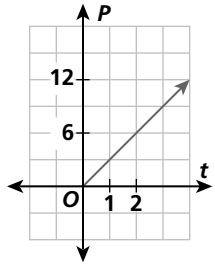
D The amount decreases by 1 yard and then doubles.

17. Joyce is sewing a banner in the shape of an equilateral triangle whose sides are t centimeters long. Which of the following graphs could represent the perimeter P in terms of the length of a side?

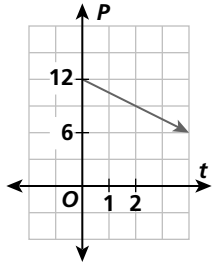
A



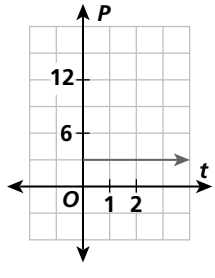
C



B



D



Name_____ Date _____ Class_____

ALGEBRA

Solve One-Step Equations

M7A2.a Given a problem, define a variable, write an equation, solve the equation, and interpret the solutions. Also M7A2.b

Select the best answer for each question.

1. Which of the following equations does NOT have a solution of 5?

A $18 - n = 13$

B $15 = \frac{60}{n}$

C $46 + n = 51$

D $8n = 40$

2. What value of y makes the equation true?

$$72.021 - y = -32.26$$

A 104.282

B 39.761

C 104.281

D 2.23

3. Jason earns $12.50 per hour. He worked on a job from 9:30 A.M. to 5:00 P.M. If he spent $20 on materials for the job, how much money does he have left over?

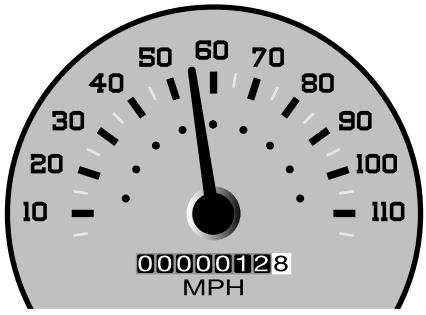
A $61.25

B $86.25

C $93.75

D $73.75

4. Ray and his grandfather drove to Canada, where the speed limits are given in kilometers per hour. The speedometer on Ray's grandfather's car gives the car's speed only in miles per hour. It currently reads as follows:



One mile equals about 1.6 kilometers. About how fast are Ray and his grandfather going in kilometers per hour?

A 34 km/h

B 49 km/h

C 57 km/h

D 88 km/h

5. Patrick lent $350 to Jennifer. 3 months later, Patrick got $375.90 back. Under what interest rate did Patrick lend the money?

A 8%

B 7.4%

C 107.4%

D 7.5%

Name_____ Date _____ Class_____

6. Which of the following values is a solution to the equation $x - 15 = 39$?

A 14

B −54

C 24

D 54

7. Rachel wants to purchase several paintings for her house with a budget of $150. If each painting costs $18.85, how many paintings can she buy?

A 9

B 8

C 7

D 6

8. Sylvia walks 7.8 miles every day. If she starts counting her miles on the first day, on what day will Sylvia have walked a total of 300 miles?

A 38

B 39

C 40

D 41

9. What is the solution to the equation below?

$$45 = \frac{x}{5}$$

A $x = 9$

B $x = 135$

C $x = 225$

D $x = 450$

10. A carpet covers the entire floor of a living room. The area of the carpet is 528 ft^2 and the width is 30 ft. What is the length of the living room?

A 17.6

B 20

C 234

D $\frac{5}{88}$

11. Which of the following is NOT a correct step in a method for solving the following equation?

$$\frac{2}{3} + x = \frac{7}{8}$$

A Subtract $\frac{2}{3}$ from both sides.

B Subtract $\frac{7}{8}$ from both sides.

C Multiply both sides by 24.

D Find a common denominator for all of the fractions.

12. Find the value of d that makes the equation true. $(-92) \div d = -8$

A 736

B 11.5

C $\frac{2}{23}$

D 11.75

13. Michel sold 6 T-shirts for $75. Michelle sold 9 T-shirts for $108. Mike sold 14 T-shirts for $178.50. Who sold the cheapest T-shirts?

A Michelle

B Mike

C Michel

D Misha

Name_____ Date _____ Class _____

14. Solve the equation below.

$$-1\frac{7}{8} = \frac{6}{16} + z$$

A $z = -1\frac{1}{2}$

B $z = 1\frac{1}{2}$

C $z = -2\frac{1}{4}$

D $z = 2\frac{1}{4}$

15. A goose was flying at a speed of 5 ft/sec. If the goose flew a total distance of 200 yards, for how many minutes was it flying?

A 0 min

B 2 min

C 60 min

D 120 min

16. The diameter of a ripple in of water is increasing at a constant rate. After 2 seconds, the diameter is 25 in. When will the diameter be 62.5 in.?

A 21 seconds

B 7.5 seconds

C 31.25 seconds

D 5 seconds

17. In a raffle, each ticket has a 1 to 16 chance of winning a prize. If John bought 4 tickets, how could you determine his chances of winning?

A divide 16 by 4

B divide 4 by 16

C subtract 4 from 16

D multiply 16 by 4

18. Mathew has is taking a 14-day vacation starting Monday. He has an activity planned for each day on Monday through Thursday of both weeks. For how many more days does Mathew need to make plans if he wishes to have an activity planned each day?

A 8 days

B 2 days

C 6 days

D 7 days

19. For which equation is $x = 3$ NOT a solution?

A $4.75 = x + 1.75$

B $-9x = -3$

C $-12.5x = -37.5$

D $-1 = \frac{x}{-3}$

Name_____ Date _____ Class_____

ALGEBRA

Solve Two-Step Equations

M7A2.b. Use the addition and multiplication properties of equality to solve one- and two-step linear equations. Also M7A2.a

Select the best answer for each question.

1. Which equation has a solution of $x = -6$?

A $3x - 2 = -24$

B $\frac{1}{3}(x) + 4 = -2$

C $\frac{2}{3}(x) + 5 = -3$

D $3x - 4 = -22$

2. Jenny has $15.00 to buy drinks for the team. Sports drink is priced at $2.75, and water is priced at $1.25. How many sports drinks she can buy if she buys 3 waters?

A 3 sports drinks

B 4 sports drinks

C 5 sports drinks

D 6 sports drinks

3. What value of z makes the equation true?

$$6z - 12 = 21 - 5z$$

A $z = 33$

B $z = 3$

C $z = 9$

D $z = 99$

4. In the equation $\frac{1}{2}x + 5 = 15$, what is the first step in isolating the variable?

A Add 5 to both sides.

B Multiply both sides by $\frac{1}{2}$.

C Subtract 15 from both sides.

D Subtract 5 from both sides.

5. David is a salesman. His weekly salary is a percentage of his sales for that week. On Monday, David's sales totaled $2000. Over the next 3 days, his sales totaled $200 more each day than the previous day. On Friday, he took the day off. If David's salary for the week was $2484, what percent of his sales did David earn?

A 31%

B 27%

C 21%

D 19%

6. What is the solution to the equation $5x + 16 = 41$?

A $x = 2$

B $x = 3$

C $x = 5$

D $x = 11.4$

Name_____ Date _____ Class_____

7. At an amusement park, an adult pays $12.00 more than a child. Mr. Brown has a coupon for $10.00 off the total price. If he takes 3 children to the park and spends a total of $78.00 for admission, what is the cost of a child's ticket to the park?

A $19.00
B $25.33
C $27.50
D $31.00

8. One cell phone company offers a plan that costs $25.00 and includes unlimited night and weekend minutes. Another company offers a plan that costs $20.00 and charges $0.30 per minute during nights and weekends. Starting at what numbers of night and weekend minutes does the second company's plan cost more than the first company's plan?

A 15 minutes
B 16 minutes
C 17 minutes
D 18 minutes

9. The perimeter of a high school basketball court is 340 feet. The length is 50 feet longer than the width. What is the width of the basketball court?

A 60 feet
B 62.5 feet
C 65 feet
D 65.5 feet

10. Some possible steps for solving the equation $-\frac{x}{7} + 3 = 9$ are shown below. Which steps are correct for solving the equation, and in which order?

I. Subtract 3 from both sides.
II. Subtract 9 from both sides.
III. Multiply both sides by 6.
IV. Multiply both sides by -7.

A Step I, then Step III
B Step I, then Step IV
C Step II, then Step III
D Step II, then Step IV

11. Sue wants to solve the following equation:

$$\frac{x}{6} - 5 = 12$$

What step should she take first?

A Multiply both sides by 6.
B Subtract 12 by both sides.
C Subtract 5 by both sides.
D Add 5 to both sides.

12. The membership dues to a pool are $75.00 per year plus $1.50 per visit. Non-members pay $5.75 per visit. How many times does a member have to visit the pool to make it worth buying a membership?

A 17 visits
B 18 visits
C 19 visits
D 20 visits

Name_____ Date _____ Class_____

13. What is the solution to the equation

$$8y + 4 = 5 - 3y?$$

A $y = \frac{1}{5}$

B $y = \frac{1}{11}$

C $y = \frac{9}{11}$

D $y = \frac{9}{5}$

14. Susan is working at a telemarketing firm during the summer. Her monthly earning is made up of a base salary and commission depending on her sales in that month. The equation $E = 500 + 0.06s$ represents the amount that Susan earns in a month if she can make a sale of s dollars. Which statement below best describes this earning?

A The earning is a flat rate of 6% of her sales

B The earning is a $600 base salary plus 5% of her sales

C The earning is a $500 base salary plus 6% of her sales

D none of the above

15. What value of x makes the equation true?

$$\frac{x}{4} - 10 = 18$$

A $x = 112$

B $x = 7$

C $x = 32$

D $x = 2$

16. Faye has $40 to spend at Funland. Admission costs $10.00, lunch will cost $6.00, and each ride ticket costs $2.00. Which equation represents the number of ride tickets x that Faye can buy?

A $6 + 2x = 40$

B $(10 + 6 + 2)x = 40$

C $10 + 2x = 40$

D $10 + 6 + 2x = 40$

17 A basketball team scored 8 points more in its second game than in its first. In its third game, the team scored 42 points. The total number of points scored in the three games was 150. How many points did the team score in its second game?

A 58

B 51

C 50

D 59

18. King Henry VIII had six wives, some of which had the same names. One more was named Catherine (although with different spellings) than was named Anne. One more was named Anne than was named Jane. How many were named Catherine?

A 1

B 2

C 3

D 6

Name_____ Date _____ Class_____

DATA AND PROBABILITY

Box-and-Whisker Plots

M7D1.d Analyze data with respect to measures of variation (range, quartiles, interquartile range). Also M7D1.c, M7D1.e, M7D1.f

Select the best answer for each question.

Use the data set below to answer questions 1–6.

14, 16, 16, 17, 18, 19, 24, 25, 25, 26, 28

1. Which value is the median of the data set?

A 18
B 19
C 18.5
D 21.5

2. Which value is the first quartile of the data set?

A 19
B 16
C 17.5
D 17

3. Which value is the third quartile of the data set?

A 25
B 25.5
C 26
D 19

4. Which values are the lower and upper extremes of the data set?

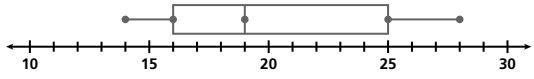
A 19 and 28
B 14 and 19
C 16 and 25
D 14 and 28

5. Which number is the interquartile range of the data set?

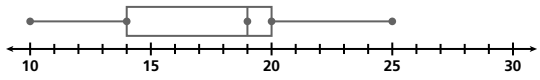
A 14
B 9
C 5
D 28

6. Which box-and-whisker plot represents the data?

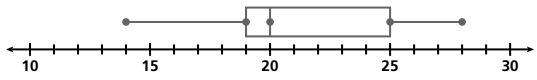
A



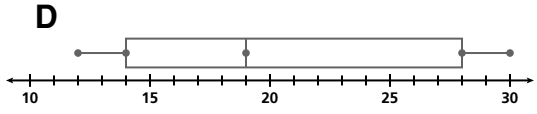
B



C

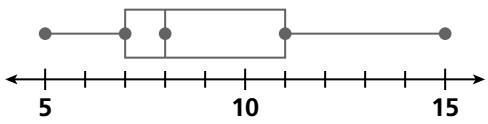


D



Name_____ Date _____ Class_____

Use the box-and-whisker plot below for questions 7–13.



7. How many values are in the data set?

A 10
B 15
C 20
D not enough information to tell

8. Which number is the interquartile range for this data set?

A 10
B 2
C 4
D 7

9. Which number is the range of the data set?

A 10
B 2
C 4
D 7

10. Which value is the first quartile of the data set?

A 7
B 8
C 11
D 15

11. Which value is the median of the data set?

A 7
B 8
C 11
D 15

12. Which value is the third quartile of the data set?

A 7
B 8
C 11
D 15

13. What percent of the data values are between 7 and 11?

A 100%
B 50%
C 25%
D not enough information to tell

Use the data set below for questions 14–20.

60, 65, 65, 70, 75, 80,

80, 85, 90, 95, 95, 100

14. What percent of the data values are between 80 and 100?

A 100%
B 50%
C 25%
D not enough information to tell

Name_____ Date _____ Class _____

15. What percent of the data values are between 67.5 and 92.5?

A 100%
B 50%
C 25%
D not enough information to tell

16. What percent of the data values are between 67.5 and 80?

A 100%
B 50%
C 25%
D not enough information to tell

17. Which number is the range of the data?

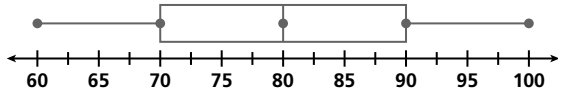
A 40
B 25
C 20
D 100

18. Which number is the interquartile range of the data?

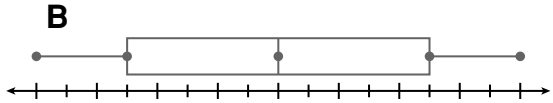
A 40
B 25
C 20
D 100

19. Which diagram is the box-and-whisker plot for this data?

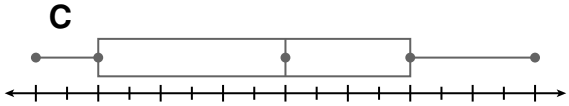
A



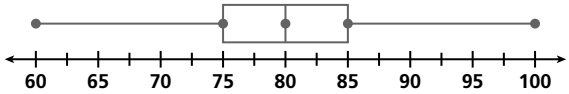
B



C



D



20. Which values are the lower and upper extremes of the data?

A 67.5 and 92.5
B 67.5 and 80
C 60 and 100
D 80 and 100

Name_____ Date _____ Class_____

DATA AND PROBABILITY

Displays of Data

M7D1.f Analyze data using appropriate graphs, including pictographs, histograms, bar graphs, line graphs, circle graphs, and line plots introduced earlier, and using box-and-whisker plots and scatter plots. Also M7D1.b

Select the best answer for each question.

1. Jessica recorded the noon temperature in her backyard each day for 30 consecutive days. Which type of graph would best show the trend in the noon temperatures over that time?

A circle graph
B histogram
C line graph
D box-and-whisker plot

2. Mr. Feldman spends $2000 per month to rent his work space. He spends $8,000 in all per month to operate his business. In a circle graph of his business expenses, what is the angle measure of the portion that represents his rent?

A 72°
B 90°
C 144°
D 180°

3. In a set of 20 data values, 5 occurs 6 times, 8 occurs 8 times, 10 occurs 2 times, and 11 occurs 4 times. How can this data NOT be represented?

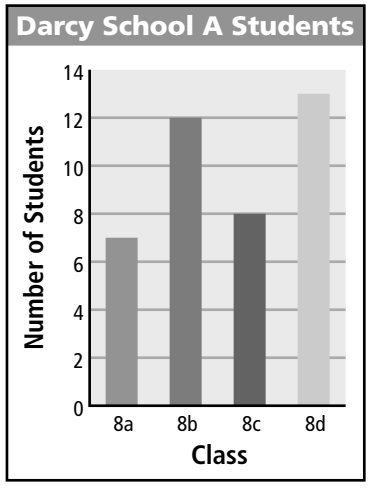
A histogram
B bar graph
C line graph
D circle graph

4. Which type of graph would best show the relationship between *y* and *x*?

x	1	2	3	4	5	6
y	4	6	8	7	10	11

A histogram
B bar graph
C pictograph
D scatter plot

5. Which frequency table represents the graph?



A

8a	8b	8c	8d
6	12	8	12

B

8a	8b	8c	8d
7	12	8	13

C

8a	8b	8c	8d
6	12	9	12

D

8a	8b	8c	8d
8	12	8	13

Name_____ Date _____ Class _____

6. Which type of graph would best represent expenses in a month related to the total amount spent?

A circle graph
B bar graph
C histogram
D line graph

7. Which type of graph would be the best choice to show how often each data value occurs in the data set?

12	8	15	12	8
15	12	13	13	9
19	8	9	8	12
19	13	12	1	19

A scatter plot
B line graph
C circle graph
D histogram

8. Greg used a circle graph to show sales for each month in a year. Which type of graph is a more appropriate choice?

A bar graph
B histogram
C line graph
D frequency table

9. Which table represents the ratios of each category to the total in all the categories?

K	L	M	N
7	8	3	2

A

K	L	M	N
7%	8%	3%	2%

B

K	L	M	N
70%	80%	30%	20%

C

K	L	M	N
35%	40%	30%	10%

D

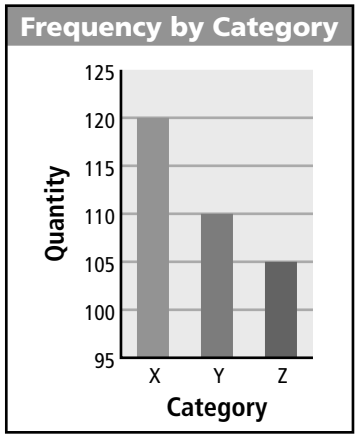
K	L	M	N
35%	40%	15%	10%

10. Which types of graph would best represent this data? (Amounts are in thousands of dollars.)

Winter	Spring	Summer	Fall
18.5	20.6	25.8	19.5

A line graph or bar graph
B line graph or circle graph
C circle graph or bar graph
D scatter plot or histogram

11. Which situation would the bar graph below most likely represent?



A student enrollment in three grades of a school
B ratios of numbers of students in each of three grades to total enrollment in those grades
C how students in one grade fared in three years of schooling
D ratios of teachers to students in three grades in a school

Name_____ Date _____ Class _____

12. Which type of graph would best represent the ratios below?

$$\frac{3}{12} \quad \frac{5}{12} \quad \frac{4}{12}$$

A line graph **C** circle graph
B frequency table **D** scatter plot

13. Demi spends $450 out of a monthly income of $2,250 on food. In a circle graph, which decimal represents the percent of her monthly income spent on food?

A 5.0 **C** 0.45
B 0.20 **D** 2.25

14. In a histogram, by how much do the heights of the columns representing the frequencies of the values 12 and 14 differ?

Data Value	12	14	18
Frequency	4	11	5

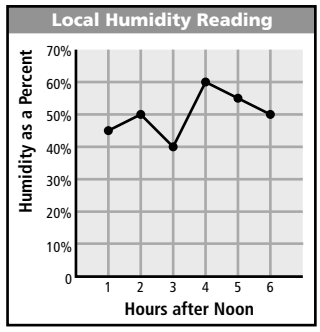
A 2 **C** 11
B 7 **D** 6

15. Jeb wants to sketch a bar graph for the data below. Then he wants to draw a horizontal line to show the mean of the data. How far above the horizontal axis should he place the horizontal line?

Score	A	B	C	D
Number of Students	3	9	14	2

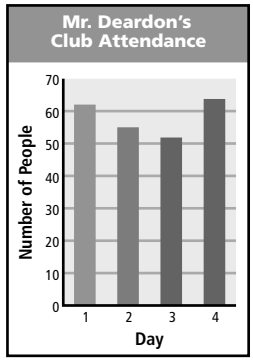
A 28 **C** 7
B 14 **D** 4

16. The line graph shows a trend in local air humidity. What is the greatest humidity?



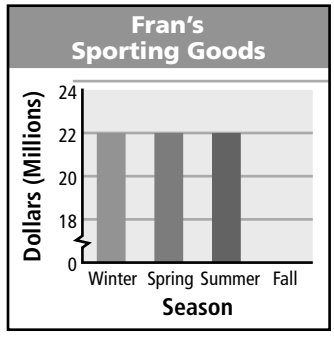
A 40% **C** 50%b
B 60% **D** 70%

17. Use the graph to estimate average daily attendance.



A about 60 **C** about 50
B about 55 **D** about 70

18. Use the graph to estimate Fran's income for the Fall.



A $2,200,000 **C** $2,500,000
B $2,000,000 **D** $3,000,000

Name_____ Date _____ Class_____

DATA AND PROBABILITY

Measures of Central Tendency

M7D1.c Analyze data using measures of central tendency (mean, median, and mode), including recognition of outliers. Also M7D1.e and M7D1.g

Select the best answer for each question.

Use the data set to answer questions 1–3.

31, 32, 33, 34, 35, 35, 45

1. What is the mean of the data?

A 33 **C** 35
B 34 **D** 36

2. What is the median of the data?

A 33 **C** 35
B 34 **D** 36

3. What is the mode of the data?

A 33 **C** 35
B 34 **D** 36

Use this information to answer questions 4–6.

Craig took two tests and got 75% and 80%.

4. What score does Craig have to get on the next test to have a mean score of 80%?

A 80% **C** 82%
B 84% **D** 85%

5. What score does Craig have to get on the next test to have a mode of 80%?

A 80%
B 82%
C 84%
D 85%

6. What score does Craig have to get on the next test to have a median score of 80%?

A any score over 80%
B any score between 75% and 80%
C any score 75% or less
D 75%

7. Set X is a set of numbers. Set Y consists of the numbers in set X each multiplied by 4. Which of the following is true?

A Sets X and Y have the same mean.
B The mean of set Y is 4 times the mean of set X.
C The mean of set Y is 4 more than the mean of set X.
D The mean of set Y is one fourth the mean of set X.

Name_____ Date _____ Class_____

8. Set X is a set of numbers. Set Y consists of the numbers in set X each increased by 7. How do the medians of sets X and Y compare?

A Sets X and Y have the same median.

B The median of set X is 7 more than the median of set Y.

C The median of set Y is 7 more than the median of set X.

D There is not enough information to compare the medians.

9. Which of the following data sets is best represented by calculating the mean?

A 12, 11, 12, 10, 11, 11, 12, 13

B 2, 2, 3, 2, 98, 99, 97, 98, 98

C 11, 12, 11, 12, 13, 11, 11, 245

D 0, 212, 211, 213, 213, 245, 245

10. The diagram below shows a sampling of prices for homes in Matilda's town. Which measure best describes the home price data?

A the most frequently occurring price in the set of home prices

B the mean of the prices of the homes in the sample

C average of the number of homes in the sample

D the total number of homes in the sample

11. Set X is a set of numbers. Set Y consists of the numbers in set X each divided by 10. Which of the following is true?

A Sets X and Y have the same median.

B The median of set Y is 10 times the median of set X.

C The median of set Y is 10 less than the median of set X.

D The median of set Y is one tenth the median of set X.

12. The data below are the hourly wages in dollars that two sets of students earn in their part-time jobs.

Set I: 6, 6, 8, 8, 8, 11

Set II: 5, 7, 8, 8, 9, 10

Which of the following measures are the same for both sets of data?

A the mean, median, and mode

B only the mean and median

C only the median and mode

D only the median

13. The data below are a student's scores on eight math quizzes.

4, 6, 6, 7, 8, 8, 8, 9

Which of the following sets of scores does NOT have the same mean?

A 3, 6, 6, 7, 8, 8, 8, 10

B 3, 5, 5, 6, 9, 9, 9, 10

C 5, 7, 7, 8, 9, 9, 9, 10

D 7, 7, 7, 7, 7, 7, 7, 7

Name_____ Date _____ Class _____

14. The table shows how many hours Ted and Muriel each spent on their computers each day over a one-week period. For what value of x will they both have the same mean number of hours per day?

Ted	2	3	2	4	3	2	3
Muriel	3	3	3	3	4	2	x

A exactly 1 hour

B exactly 2 hours

C exactly 3 hours

D $2\frac{5}{7}$ hours

15. Kanella jogs five times each week. The following data show the distances in miles that she jogged in each of four weeks. In which week was the mean of the distances the greatest?

A Week 1: 3.5, 4.0, 4.0, 3.5, 4.0

B Week 2: 3.5, 3.5, 3.5, 4.0, 3.5

C Week 4: 4.0, 4.0, 4.0, 3.5, 4.0

D Week 3: 3.5, 4.0, 3.5, 4.0, 3.5

16. The data below are the ages in years of the students in two different focus groups.

Group I: 14, 15, 15, 15, 17, 18, 18

Group II: 13, 14, 15, 15, 15, 16, 17

Which of the following measures are the same for both groups?

A the mean, median, and mode

B only the mean and median

C only the median and mode

D only the mode

17. The data below are the numbers of words per minute a student typed in six different typing tests.

47, 48, 45, 52, 56, 47

Which of the following sets of data has the same median?

A 38, 44, 47, 47, 49, 50

B 40, 41, 47, 48, 48, 51

C 39, 45, 48, 48, 50, 51

D 42, 47, 48, 49, 49, 50

18. The diagram shows test scores for two friends in the eighth grade at the same school. What value of x will give Suzy a higher mean on her four tests than Martin?

A exactly 82

B any score higher than 82

C exactly 86

D any score higher than 86

Name_____ Date _____ Class_____

DATA AND PROBABILITY

Measures of Variation

M7D1.d Analyze data with respect to measures of variation (range, quartiles, interquartile range). Also M7D1.c, M7D1.e, M7D1.f

Select the best answer for each question.

1. What is the range of this set of data?

1, 2, 3, 4, 5, 5, 15

A 6 **C** 14

B 7 **D** 15

2. A data set consists of 10 numbers. Nine of them are 5. Which best describes the data value 5?

A mean **C** mode

B median **D** range

3. A set of data contains exactly 24 numbers. The range of the data set is 0. Which of the following is true?

A The mean of the data is 0.

B All of the data values are the same number.

C The median of the data is 0.

D All of the data values are different from one another.

4. The table shows selected monthly salaries in dollars of some employees in a company. Which measure best represents the distribution of the data?

2000	2000	10,000	2000
2000	2000	2000	2000
3000	2000	2000	3000
2000	2000	2000	2000
2000	2000	2000	2000

A mode

B the sum of the salaries

C mean

D range

5. Sammy visited 12 local stores that sell music videos. He recorded the prices of one specific music video. Which of the following measures would best describe the price someone might expect to pay for the video?

A range **C** median

B mode **D** mean

6. Which set of data values has the greatest range but the smallest median?

A 1, 98, 98, 98, 101

B 1, 2, 50, 98, 101

C 3, 4, 4, 4, 103

D 5, 20, 30, 90, 101

7. Mr. Hohmann wants to find the number x that will help him separate 18 test scores into two groups. One group of scores will be less than x. The other set of scores will be greater than x. Which measure will help him do that?

A range

B mode

C median

D mean

Name_____ Date _____ Class_____

8. The median of a set of 15 data values is 24. The smallest value is 3 and the greatest value is 5 more than the median. Which is the range of the data?

A 26
B 21
C 29
D 8

9. Which is the third quartile of this data set?

11, 11, 14, 16, 19, 20, 21, 21

A 17.5
B 20
C 20.5
D 21

10. Set X is a set of numbers. Set Y consists of the numbers in set X each decreased by 10. Which of the following is true?

A Sets X and Y have the same range.
B The range of set X is 10 less than the range of set Y.
C The range of set X is 10 more than the range of set Y.
D The range of set X is one-tenth the range of set Y.

11. In a set of 11 data values, the median is 13. The smallest data value is 5 less than the median. The greatest data value is 12 more than the median. Which is the range of the data?

A 24
B 11
C 7
D 17

12. Which change to the data set below will cause the mean to increase but the range and median to stay the same?

3, 5, 6, 8, 13

A subtract 2 from the smallest value and add 2 to the greatest value
B add 2 to both the smallest and greatest values
C subtract 2 from both the smallest and greatest values
D add 2 to each number in the data set

13. How many data values in this data set are in the top 25% of the data?

1, 2, 3, 4, 4, 5, 6, 7, 8, 9, 10, 11

A 12
B 9
C 6
D 3

Name_____ Date _____ Class_____

14. The data below are the prices in dollars of CDs at two local stores.

Store I: 10, 10, 11, 12, 14, 20

Store II: 10, 10, 11, 12, 14, 15

Which of the following is NOT a correct comparison for the two sets of prices?

A The mean for Store I is greater.
B The median for Store I is greater.
C The modes are the same.
D The range for Store I is greater.

15. The data below are the heights in centimeters of two sets of plants after one month of growth.

Set I: 8, 8, 9, 9, 9, 9, 10, 10

Set II: 5, 7, 8, 9, 9, 9, 11, 14

Which measure is NOT the same for Set II as for Set I?

A mean
B median
C mode
D range

16. By how much does the range of Set Y exceed the range of Set X?

Set X: 8, 8, 9, 9, 9, 9, 10, 10

Set Y: 5, 7, 8, 9, 9, 9, 11, 14

A 2
B 4
C 7
D 9

17. Data Set I and Set II have the same range. The smallest data value in Set I is 12.5 and the greatest data value is 22.5. The smallest data value in Set II is 42. What is the maximum data value in Set II?

A 10
B 52
C 64.5
D 54.5

18. Which is the first quartile of this data set?

4, 6, 6, 7, 8, 8, 9, 12, 15, 16, 20, 24

A 6
B 6.5
C 7
D 12

Name_____ Date _____ Class_____

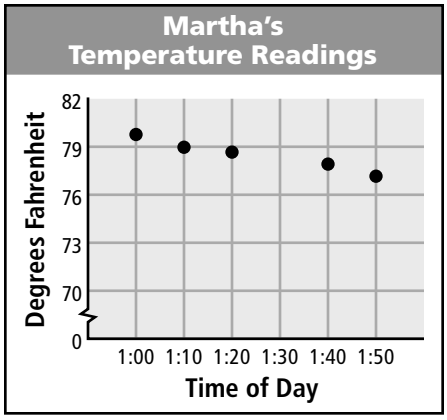
DATA AND PROBABILITY

Scatter Plots and Lines of Best Fit

M7D1.g Analyze and draw conclusions about data, including a description of the relationship between two variables.

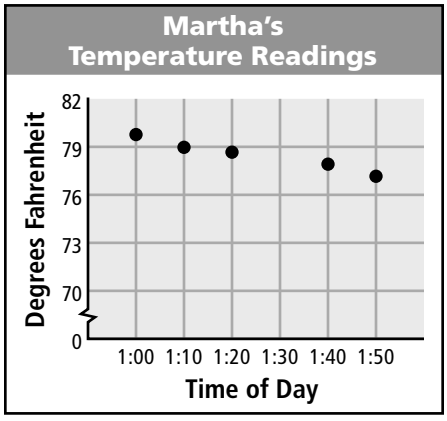
Select the best answer for each question.

1. The scatter plot shows temperature readings. Which is the most likely reading for 1:30 P.M.?



A 70°F **C** 88°F
B 77°F **D** 92°F

2. The scatter plot shows temperature readings. Which is the most likely reading for 12:50 P.M.?



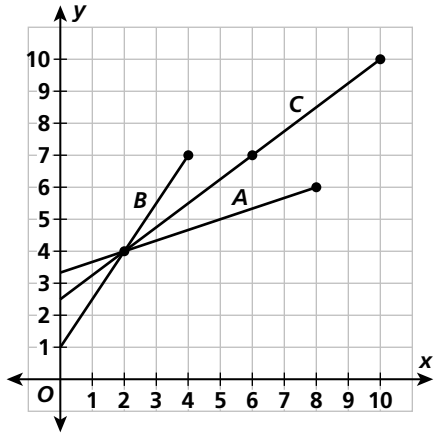
A 60°F **C** 80°F
B 65°F **D** 70°F

3. Which statement best describes the relationship between *x* and *y*?

x	2	4	6	8
y	10	30	39	62

A As *x* increases, *y* increases.
B As *x* increases, *y* decreases.
C There is no relationship.
D There is not enough information.

4. Which line appears to be the line of best fit for the data on the graph?



A line A **C** line C
B line B **D** none

5. Which statement is true about the relationship between *x* and *y*?

x	1	2	3	4	5
y	3	7	5	2	9

A As *x* increases, *y* increases.
B As *x* increases, *y* decreases.
C There is no relationship.
D The line of best fit for these data would be vertical.

Name_____ Date _____ Class _____

6. In a scatter plot comparing x and y, the line of best fit is horizontal. Which statement best describes the relationship between x and y?

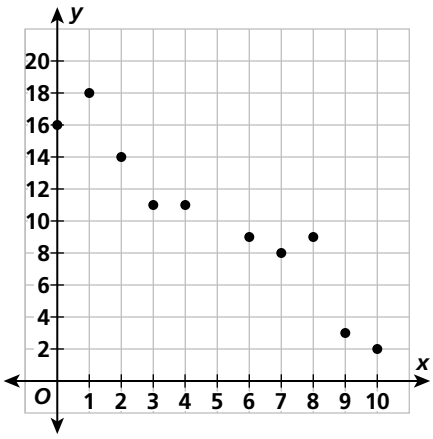
A As x increases, y increases.

B As x increases, y decreases.

C As x increases, y stays the same.

D As y increases, x stays the same.

Use this scatter plot to answer questions 7–9.



7. Which line is most likely to be the line of best fit for the data?

A a horizontal line through (2, 10) and (8, 10)

B a vertical line through (5, 4) and (5, 16)

C a line that rises from left to right

D a line that falls from left to right

8. Which statement best describes the relationship between x and y?

A as x increases, y increases

B as x increases, y decreases

C there is no relationship

D the line of best fit for these data would rise from left to right

9. Which is the most likely value of y when the value of x is 5?

A 15 **C** 0

B 10 **D** 5

10. Data comparing leg lengths and heights of students are shown in a scatter plot. The values for leg lengths are shown on the horizontal axis. Which statement is most likely true about the line of best fit?

A The line of best fit is vertical.

B The line of best fit is horizontal.

C The line of best fit rises from left to right.

D The line of best fit falls from left to right.

11. Which statement is NOT true about a line of best fit for data shown in a scatter plot?

A The line of best fit must be vertical.

B The line of best fit may be horizontal.

C The line of best fit may go through all of the points.

D The line of best fit may not go through any of the points.

12. Emma recorded the temperature each hour from 4 A.M. until noon one day. She displayed the data in a scatter plot. Which statement is most likely to be true about the relationship between time and temperature on her scatter plot?

A As time passes, the temperature increases.

B As time passes, the temperature decreases.

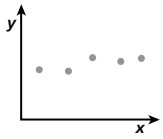
C As time passes, the temperature stays the same.

D As the temperature increases, time stays the same.

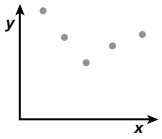
Name_____ Date _____ Class _____

13. In a set of data, the value of *y* decreases as the value of *x* increases. Which diagram could be a scatter plot of the data?

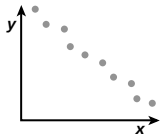
A



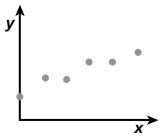
C



B



D



14. In a scatter plot comparing *x* and *y*, the line of best fit is vertical. Which statement best describes the relationship between *x* and *y*?

A As *x* increases, *y* increases.

B As *x* increases, *y* decreases.

C As *x* increases, *y* stays the same.

D As *y* increases, *x* stays the same.

15. Which statement is true about the relationship between *x* and *y*?

x	1	2	3	4	5
y	6	7	6	6	5

A As *x* increases, *y* increases.

B The line of best fit for these data would rise from left to right.

C Neither A nor B are true.

D Both A and B are true.

16. Which statement best describes the relationship between *x* and *y*?

x	1	2	3	4	5
y	1	4	5	7	8

A The line of best fit for these data would fall from left to right.

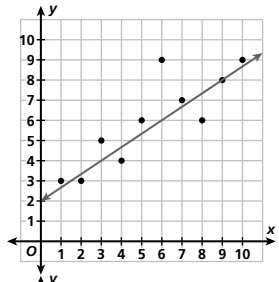
B As *x* increases, *y* decreases.

C There is no relationship.

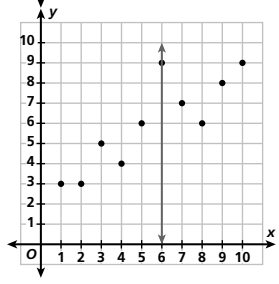
D As *x* increases, *y* increases.

17. Which diagram shows a line of best fit?

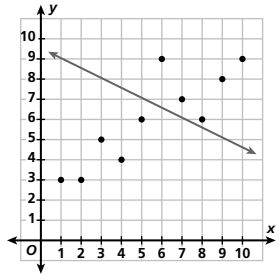
A



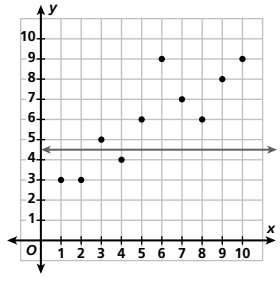
B



C



D



18. In a scatter plot comparing *x* and *y*, the line of best fit rises from left to right. If the *x*-values are along the horizontal axis, which statement best describes relationship between *x* and *y*?

A As *x* increases, *y* increases.

B As *x* increases, *y* decreases.

C As *x* increases, *y* stays the same.

D As *y* increases, *x* stays the same.

Name_____ Date _____ Class_____

DATA AND PROBABILITY

Surveys and Samples

M7D1.a Formulate questions and collect data from a census of at least 30 objects and from samples of varying sizes.

Select the best answer for each question.

Researchers tried various ways of estimating the percentage of students who chew gum. Use this information to answer questions 1–4.

1. Researchers called students' parents to ask whether their children chew gum. What is wrong with this sampling method?

A Parents also may chew gum.

B Parents cannot control their children's behavior during the day.

C Parents may not know whether their children chew gum.

D Parents may be biased against this study.

2. Researchers watched students walking to school in the morning and counted the number who were chewing gum. Which is NOT a problem with this sampling method?

A Students who drive or get rides may chew gum in their cars.

B Students may chew gum at other times of the day.

C Students may have a test first period.

D Students may not want to chew gum while walking to school because they will have to throw it away when they get there.

3. Researchers asked students if they chew gum. What is the problem with data from direct questioning like this?

A The subjects would know not to talk to strangers.

B The subjects may think the researchers work for a gum company.

C The subjects may want to be paid for answering.

D The subjects may not answer questions accurately.

4. A researcher watched students at a block party in his neighborhood to see how many were chewing gum. Why is this sometimes called a "convenience sample"?

A It is convenient for students to go to a party in their own neighborhood.

B It is convenient for the researcher to use nearby subjects.

C Because gum is often purchased at a convenience store.

D Gum would be conveniently available to people at a party.

5. What is a problem with an inference based on a convenience sample?

A It is too easy and convenient.

B People may not answer honestly.

C A sample of fewer than 24 people is not valid.

D The sample may not represent the population.

Name_____ Date _____ Class _____

A candidate for mayor wants to poll voters to see how well her campaign is doing. Use this information for questions 6–10.

6. What is wrong with using diners at The Pizza House as the sample?

A They may not be representative of voters in the whole city.

B It is illegal to conduct a poll in a private restaurant.

C They will be too busy eating.

D They are more likely to favor the incumbent mayor.

7. What is the biggest problem with posting signs asking people to call the pollsters with their opinions?

A People will not see the signs.

B Self-selected responders are not a random sample.

C There may be too many callers whose last names start with A–L.

D Callers may not tell the truth.

8. Which of the following would be the best sample for this poll?

A all registered democrats in the city

B every person who has ever called the mayor's office

C a randomly selected group of registered voters

D parents dropping their kids off at school

9. Suppose 49 out of 100 people in a fair sample support the candidate. Which is the best conclusion?

A The race is close.

B The candidate will lose.

C The candidate will win.

D Polling is not useful in local elections.

10. What is wrong with having television viewers picking the best singer on a talent show?

A Most people cannot judge talent.

B The phone lines may be busy.

C The network may not report the results accurately.

D People can vote based on things other than talent.

11. Three people are asked to try a new juice drink. Two of them like it. What is the best conclusion?

A The drink is good.

B More people should be asked.

C The drink should be improved.

D Individual reports are unreliable.

12. Which group would NOT be a good random sample of students in a junior high school?

A the shortest student in each home room class

B every 5th student in a line of all the students arranged by height

C every student whose birthday is on the 7th day of a month

D every 10th student to arrive at school on Monday morning

Name_____ Date _____ Class_____

13. In recent public opinion polls, researchers found that 56%, 58%, 52%, and 54% of the voters surveyed preferred Mr. Charles as a new city councilor. What is the mean of these percents?

A 52%
B 54.5%
C 55%
D 58%

14. The table shows how many people preferred each brand of cereal. Which conclusion is justified?

Brand	Number of People
W	58
X	58
Y	60
Z	61

A There is no clear favorite cereal.
B All the cereals are the same.
C Cereal is only for children.
D The surveyors need to take a new sample.

15. In a sample of voters in Newtown, 18 out of 25 favored building a new junior high school. If 50,000 people vote in the next Newtown election, how many are likely to vote in favor of the new school based on this sample?

A 900,000
B 2000
C 36,000
D 18,000

16. Suppose $\frac{1}{4}$ of your socks are blue. How many pairs of socks would you have to select randomly, on average, in order to get 4 pairs of blue socks?

A 16 **C** 4
B 20 **D** 8

17. Suppose you have 18 pairs of socks. When you pick 6 pairs at random, 4 of them are white. What is the best estimate of the total number of pairs of white socks?

A 3 **C** 27
B 12 **D** 4

18. A big bowl has 240 yellow marbles and some green marbles. A random sample of 10 marbles contains 4 yellow marbles and 6 green marbles. What is the best estimate of the total number of green marbles in the bowl?

A 6
B 240
C 60
D 360

Name_____ Date _____ Class_____

SAMPLE TEST A

Select the best answer for each question.

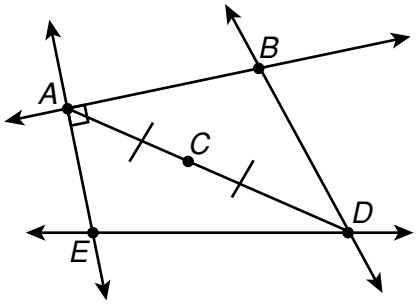
1. What is the value of $3x^2 + 2$ when $x = -4$?

A -142
B -46
C 50
D 146

2. Warren bought a piece of pipe $8\frac{3}{4}$ feet long. He cut off a piece $4\frac{11}{12}$ feet long to fix the shower. How much extra pipe did he have?

A $3\frac{7}{12}$ feet
B $3\frac{5}{6}$ feet
C $4\frac{1}{12}$ feet
D $4\frac{3}{4}$ feet

3. Which point in the figure is a midpoint?



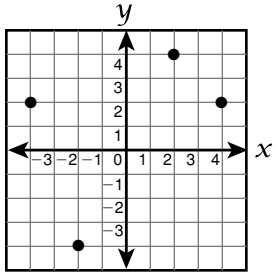
A *A*
B *B*
C *C*
D *D*

4. Which rule will generate the values of *y* from the values of *x*?

x	1	2	3	4
y	−4	−1	4	11

A Subtract 5 from the cube of *x*.
B Subtract 8 from the square of $x + 1$.
C Add 7 to *x*.
D Subtract 5 from the square of *x*.

5. Which ordered pair corresponds to a point plotted on the coordinate grid?



A (−4, 2)
B (−4, −2)
C (−2, 4)
D (4, −2)

6. Four people are asked to try a new energy bar. Three of them like it. What is the best conclusion?

A The drink is good.
B More people should be asked.
C The drink should be improved.
D Individual reports are unreliable.

Name_____ Date _____ Class_____

7. One bowling alley gives awards for the highest average scores. The table shows the four top averages. Who won the third-place trophy?

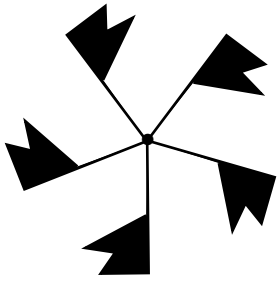
Bowler	Average Score
Don	218.178
Pete	218.036
Susan	218.158
Earlene	218.060

A Don
B Pete
C Susan
D Earlene

8. Which of the following equations represents an inverse variation?

A $3x = 4y$
B $5 - 2x + y = 1$
C $y^3 = x$
D $xy = 8$

9. What types of symmetry does this design have?



A rotational symmetry
B line symmetry
C line and rotational symmetry
D no symmetry

10. Mary Anne is planning to landscape her yard. She goes to the Flower Power Store and finds that the average price per flat of perennials is \$32.50. She also needs to buy some fertilizer that costs \$15.00 per bag. The equation $C = \$32.50(f) + \$15.00b$, where C is the total cost, f is the number of flats purchased, and b is the number of fertilizer bags, can be used to determine her total cost.

What is Mary Anne's total cost if she buys 4 flats and 2 bags of fertilizer?

A \$53.50
B \$160.00
C \$195.00
D \$225.00

11. Rachel bought $3\frac{2}{3}$ pounds of grapes. Her brother ate $\frac{1}{3}$ of the grapes. Then her father ate $\frac{1}{8}$ of the grapes that were left over. How many pounds of grapes are left?

A $2\frac{5}{36}$ pounds
B $2\frac{5}{16}$ pounds
C $2\frac{5}{8}$ pounds
D $3\frac{5}{24}$ pounds

Name_____ Date _____ Class_____

12. Which percent of the data values in the following data set is between 70 and 100?

50, 55, 55, 60, 70, 75,
80, 85, 90, 95, 95, 100

A 25%
B 50%
C 75%
D 100%

13. How many degrees are there in a rotation that is $\frac{2}{3}$ of a complete turn?

A 90°
B 180°
C 240°
D 300°

14. What is the solution to the following equation?

$$-\left(\frac{t}{6}\right) = 24?$$

A $t = -4$
B $t = 4$
C $t = -144$
D $t = 144$

15. When the point (5, 1) is translated 4 units to the right and 3 units down, what are the new coordinates?

A (1, −2)
B (5, −2)
C (9, −1)
D (9, −2)

16. Which is equivalent to −12?

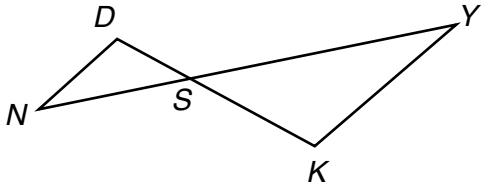
A $-(-12)$
B $|-12|$
C $-|12|$
D 12

17. The table below shows the *x*- and *y*-coordinates of some ordered pairs. Which equation describes the relationship of the *x* values to the *y* values?

x	2	3	4	5
y	8	18	32	50

A $y = 4x$
B $y = x^2 + 4$
C $y = 2x^2$
D $y = 3x + 2$

18. Triangles *DNS* and *KYS* are similar. Which angle has the same measure as $\angle D$?



A $\angle K$
B $\angle Y$
C $\angle DSN$
D $\angle YSK$

Name_____ Date _____ Class_____

19. What value of r makes the equation true?

$$6r + 12 = 20 - 5r$$

A $z = 2$

B $z = 12$

C $z = 20$

D none of the above

20. The angle at the tip of Bills' pizza slice measures 70°. He gives half to Flo, who gives half to Jim. What is the angle measure at the tip of Jim's piece?

A 17.5°

B 25°

C 45°

D 70°

21. The average monthly temperatures for two cities are given below.

Average Monthly Temperatures (°F)

Month	J	M	M	J	S	N
City A	11	25	62	70	70	35
City B	62	60	72	81	80	65

Which is a true statement about the cities?

A The mean of City A's average temperatures is equal to the mean of City B's average temperatures.

B The range of City A's average temperatures is less than the range of City B's average temperatures.

C The median of City A's average temperatures is greater than the median of City B's average temperatures.

D The mode of City A's average temperatures is equal to the mean of City B's average temperatures.

22. How many lines of symmetry does a right triangle with two congruent sides have?

A 0

B 1

C 2

D 3

23. What is the value of x in the equation below?

$$5x - 7 = 21 - 2x$$

A 2

B 3

C 4

D 5

Name_____ Date _____ Class _____

24. Which group would NOT be a good random sample of students in a particular junior high school?

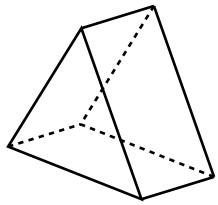
A Every 4th student in a line of all students arranged by age

B The tallest student in each home room class

C Every student whose birthday is on the 11th day of a month

D Every 10th student to arrive at school on Wednesday morning

25. What is the base of this prism?



A triangle

B parallelogram

C rectangle

D square

26. A swordfish is 1,321 feet below sea level. A heron is 2,143 feet above sea level. What is the total distance between the swordfish and the heron?

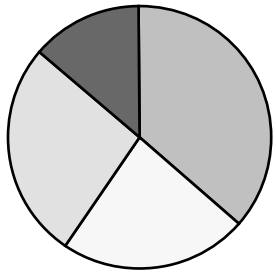
A −3,464 feet

B −822 feet

C 822 feet

D 3,464 feet

27. Which data could best be represented by this graph?



A Change in distance over time

B Height of major mountain ranges

C High temperature each day

D Number of students playing various musical instruments

28. A jar of peanuts says it contains 12 ounces of peanuts. Emily ate 0.4 of the peanuts in the jar. How many ounces of peanuts are left?

A 0.48 ounces

B 0.72 ounces

C 4.8 ounces

D 7.2 ounces

29. The table below shows a set of data. Which of the following is true about the line of best fit?

x	1	2	3	4	5
y	4	7	9	12	15

A The line rises from left to right.

B The line falls from left to right.

C The line is horizontal.

D The line rises, then falls from left to right.

Name_____ Date _____ Class_____

30. Carla's Detail Car Wash will come to your home to clean your car. This service charges $12.00 per car plus $5.00 for each hour after the first hour. Which algebraic expression describes how to figure the total cost?

A $12c + 5h$

B $12c + 5(h + 1)$

C $12c + 5(h - 1)$

D $60ch$

31. Which figure looks the same after a rotation of 180°?

A square

B circle

C regular hexagon

D all of the above

32. What is the mean of the following data set?

1, 99, 2, 98, 3, 97, 4, 96, 5, 95

A 47

B 50

C 75

D 100

33. Which shows the numbers $\frac{2}{3}$, $\frac{7}{10}$, $-\frac{6}{7}$, 0.19 and −0.8 in order from least to greatest?

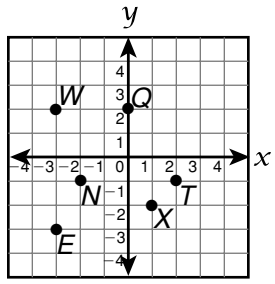
A $-0.8, 0.19, \frac{2}{3}, -\frac{6}{7}, \frac{7}{10}$

B $-0.8, -\frac{6}{7}, 0.19, \frac{2}{3}, \frac{7}{10}$

C $-\frac{6}{7}, -0.8, 0.19, \frac{2}{3}, \frac{7}{10}$

D $-\frac{6}{7}, -0.8, 0.19, \frac{7}{10}, \frac{2}{3}$

34. Which three points are the vertices of an isosceles triangle?



A Points *W, Q,* and *N*

B Points *Q, X,* and *N*

C Points *Q, T,* and *N*

D Points *E, N,* and *X*

35. The value of y varies directly with x, and $y = 16$ when $x = 12$. What is the value of y if $x = 3$?

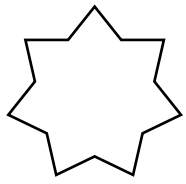
A −16

B −4

C 4

D 12

36. How many lines of symmetry does this figure have?



A 0 lines

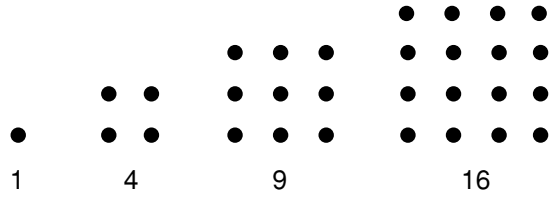
B 5 lines

C 7 lines

D 14 lines

Name_____ Date _____ Class _____

37. The numbers represented below are called square numbers. What is the next number in the pattern?

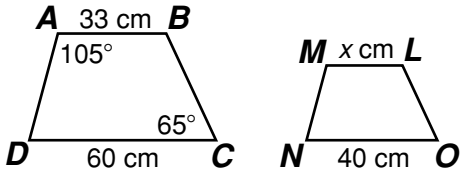


A 17
B 20
C 24
D 25

38. Which data characteristic would be most useful in comparing the data set 40, 41, 42, 45, 46, 48, 89 and the data set 16, 41, 43, 44, 47, 48, 49?

A mean
B median
C mode
D range

39. Trapezoid *ABCD* is similar to trapezoid *MLON*. What is the length of $\overline{LM}$?



A 13 cm
B 22 cm
C 23 cm
D 49.5 cm

40. Helen deposits the same amount into her bank each week. The table below show her balance for the last four weeks.

Week 1	Week 2	Week 3	Week 4
$14.50	$29.00	$43.50	$58.00

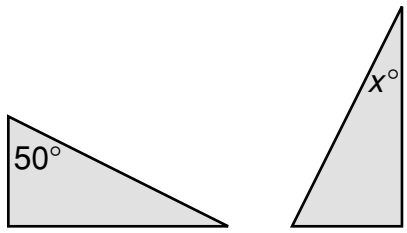
Which equation describes her balance in dollars, *b*, for any week, *w*?

A $b = 14.5w$
B $b = w + 14.5$
C $(w\backslash b) = 14.5$
D $b = 58 - w$

41. What is the size of the angle formed from bisecting an interior angle of a hexagon?

A 36°
B 60°
C 72°
D 180°

42. If the two right triangles are similar, what is the measure of *x*?



A 30°
B 40°
C 50°
D 60°

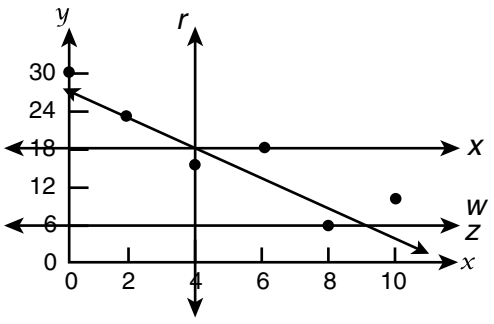
Name_____ Date _____ Class_____

43. Add.

$$\begin{array}{r} -1094 \\ +\ -319 \\ \hline \end{array}$$

A −1413
B −775
C 775
D 1413

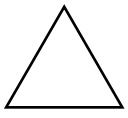
44. Which of the following lines appears to be the line of best fit for the data shown?



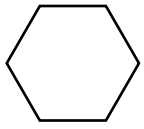
A line *r*
B line *s*
C line *z*
D line *w*

45. Which figure does NOT look the same after a reflection across a horizontal line?

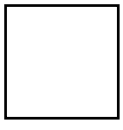
A



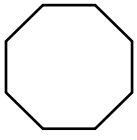
B



C



D



46. What is the value of the expression $76 - |-24|$?

A 47
B 52
C 72
D 100

47. What is the solution to the equation $16y + 8 = 10 - 6y$?

A $y = \frac{1}{5}$
B $y = \frac{1}{11}$
C $y = \frac{9}{11}$
D $y = \frac{9}{5}$

48. Which three-dimensional figure does NOT have a vertex?

A cone
B hemisphere
C cylinder
D both B and C

49. A car is traveling at a constant speed. After 4 hours, the car has traveled 216 miles. If the car continues to travel at the same constant speed for another 3 hours, how much further has it traveled?

A 80 miles
B 124 miles
C 162 miles
D 210 miles

Name_____ Date _____ Class _____

50. Which two numbers come next in the pattern?

303, 295, 291, 283, 279, ...

A 275, 267

B 271, 263

C 275, 271

D 271, 267

51. The table shows how many people preferred each brand of cereal. Which conclusion is justified?

Brand	Number of People
1	45
2	47
3	47
4	48

A All the cereals are the same.

B Cereal is only for children.

C There is no clear favorite cereal.

D The surveyors need to take a new sample.

52. Subtract.

$$\begin{array}{r} 2579 \\ -1237 \\ \hline \end{array}$$

A −3,816

B −1,342

C 3,816

D 1,342

53. Herschel is borrowing $600 for 1 year. The loan company charges 8% yearly interest. Which formula can be used to find the interest Herschel will owe?

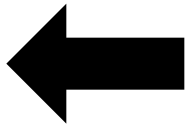
A $I = 600 \cdot 8 \cdot 365$

B $I = 600 \cdot 0.8 \cdot 1$

C $I = 600 \cdot 0.08 \cdot 1$

D $I = 600 + 0.08 \cdot 600 \cdot 1$

54. In what direction will this arrow point after it is rotated $\frac{1}{4}$ turn clockwise?



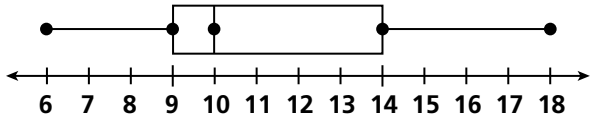
A right

B left

C up

D down

55. What is the median of the data set shown in this box and whisker plot?



A 5

B 7

C 10

D 14

Name_____ Date _____ Class_____

56. José works part-time at a hospital where he earns $18 per hour. The table shows the number of hours he worked last week. How much money did José earn last week?

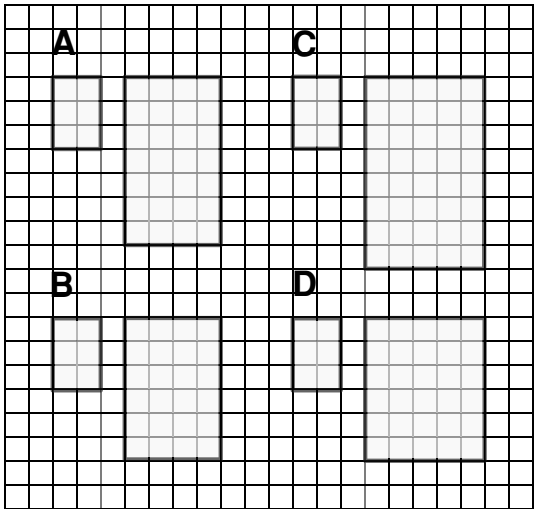
Day	Hours
Mon.	4
Tues.	6
Wed.	4
Thurs.	4

A $72
B $324
C $234
D $1,296

57. Jeff took two tests and got 79% and 88%. What does he have to get on the next test to have a mean score of 89%?

A 89%
B 90%
C 98%
D 100%

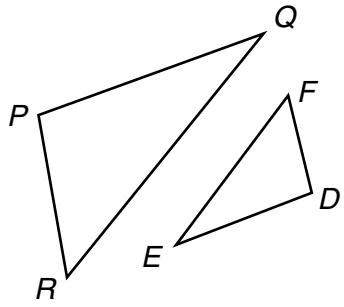
58. Which pair of rectangles are similar?



59. Which equation has a solution of $x = -12$?

A $3x - 2 = -24$
B $\frac{1}{3}x - 4 = -8$
C $3x - 4 = -24$
D $\frac{2}{3}x - 5 = 3$

60. These triangles are similar. You know *PR* and want to find *FD*. Which two lengths can you use to solve the problem?



A *ED, EF*
B *RQ, EF*
C *RQ, ED*
D *PQ, EF*

61. Which numbers are in order from least to greatest?

A $\frac{5}{6}, -\frac{3}{4}, -\frac{2}{3}, \frac{1}{2}$
B $-\frac{3}{4}, -\frac{2}{3}, \frac{1}{2}, \frac{5}{6}$
C $-\frac{2}{3}, -\frac{3}{4}, \frac{1}{2}, \frac{5}{6}$
D $-\frac{3}{4}, -\frac{2}{3}, \frac{5}{6}, \frac{1}{2}$

Name_____ Date _____ Class _____

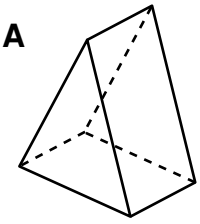
62. Which is the 3rd quartile of this data set?

10, 10, 12, 15, 23, 34, 44, 44, 45, 60

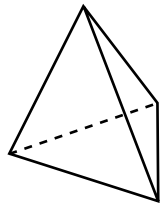
A 10
B 12.75
C 44
D 28.5

63. Which three-dimensional figure has the most vertices?

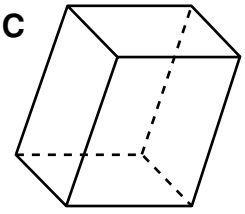
A



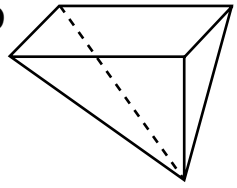
B



C



D



64. Which of the following values is a solution to the equation $x - 12 = 37$?

A $x = -49$
B $x = 25$
C $x = 39$
D $x = 49$

65. The chart shows the temperature, in degrees celsius at 3 P.M. in St. Paul over several days. Between which two days is the greatest amount of change?

Day	1	2	3	4	5
Temp.	−2°	−6°	2°	−4°	0°

A Day 1 and Day 2
B Day 2 and Day 3
C Day 3 and Day 4
D Day 4 and Day 5

66. Which graph is a good way to show the relationship between a whole and the parts it is made up of?

A bar graph
B circle graph
C histogram
D stem-and-leaf plot

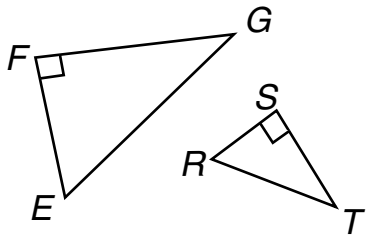
67. What value of y makes the equation true?

$$84.015 - y = 26.32$$

A 22
B 34.455
C 48.5
D 57.695

Name_____ Date _____ Class_____

68. Triangles *EFG* and *RST* are similar, and the ratio of corresponding sides is 4 : 1. If $SR = 3.5$ cm, what is *FE*?



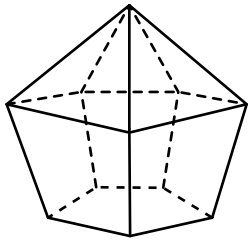
A 1.75 cm
B 7 cm
C 14 cm
D 15.5 cm

69. Tony plotted (−4, 3), (−2, 6), and (3, 6) on a coordinate grid. He needs to graph one more ordered pair in order to connect the points to make a parallelogram. Which other ordered pair could Tony graph?

A (1, 4)
B (−1, 6)
C (1, 3)
D (3, 1)

70. How many vertices does this three-dimensional figure have?

A 10
B 11
C 12
D 15

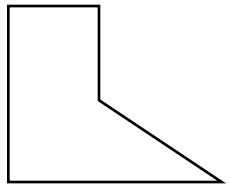


71. Divide.

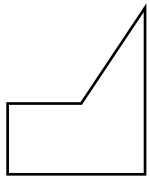
$$-54\overline{)-2025}$$

A −37.5
B −22.75
C 37.5
D 50

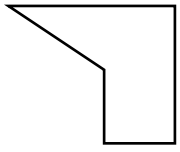
72. What does the figure look like after a reflection across a vertical line?



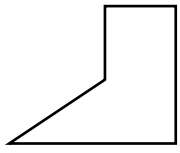
A



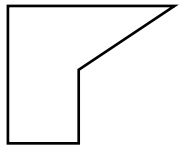
B



C



D

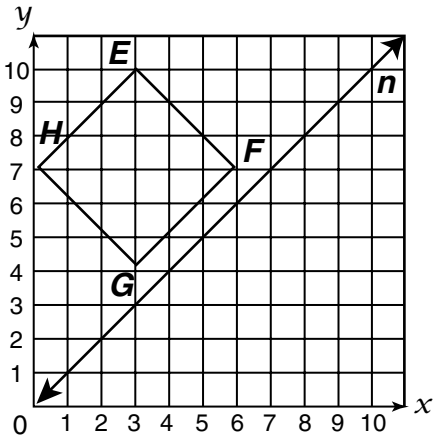


73. Set X is a set of numbers. Set Y consists of the numbers in set X each decreased by 6. How do the medians of sets X and Y compare?

A Sets X and Y have the same median.
B The median of set X is 6 less than the median of set Y.
C The median of set Y is 6 less than the median of set X.
D There is not enough information to compare the medians.

Name _____ Date _____ Class _____

74. The square is flipped across line *n*. What are the coordinates of point *F*?



A (6, 5)

B (7, 6)

C (7, 7)

D (8, 7)

75. The table shows the population of four states according to the 2000 census.

State	Population (in millions)
Nevada	1.998
New Mexico	1.819
New York	18.976
West Virginia	1.808

Which shows the states in order from the greatest population to the least population?

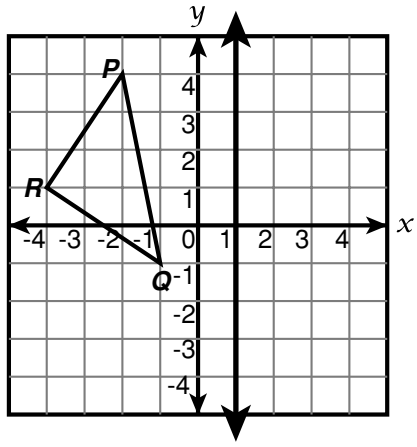
A New York, New Mexico, Nevada, West Virginia

B Nevada, New York, New Mexico, West Virginia

C New York, Nevada, New Mexico, West Virginia

D West Virginia, New Mexico, Nevada, New York

76. Which translation will move point *Q* to the location (2, −3)?



A left 2, up 3

B left 3, up 2

C right 2, down 3

D right 3, down 2

77. Tom gets $20.00 every week for lunch. He spends $3.00 each day. The table shows how much money he has left at the end of each day. If the pattern continues, how much money will Tom have left after the fifth day?

Day	1	2	3
Amount left	$17	$14	$11

A $3.00

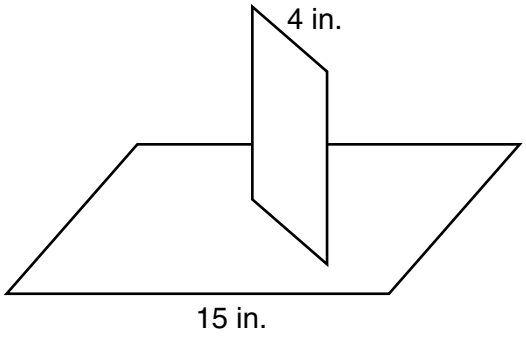
B $5.00

C $6.00

D $8.00

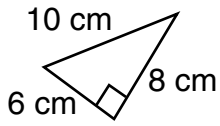
Name_____ Date _____ Class_____

78. The parallelograms are similar with a side ratio of 1 : 2. What is the longer side in the smaller shape?



A 2 in.
B 7.5 in.
C 8 in.
D 30 in.

79. A right triangle similar to the one below has a hypotenuse of 15 cm. What is the length of the shorter leg?



A 25 cm
B 12 cm
C 12 cm
D 9 cm

80. Jeffrey got all the questions on the math test correct except one. He incorrectly found the product -320×17 to be 5550. What is the correct quotient?

A −5,500
B −5,440
C 5,000
D 5,440

81. The table shows the highest and lowest elevations in New Mexico.

Location	Elevation (feet)
Wheeler Peak	13,161
Red Bluff Lake	2,817

What is the difference between these two elevations?

A −10,344 feet
B 9,887 feet
C 5,670 feet
D 10,344 feet

82. In the equation $\frac{1}{4}x + 12 = 36$, what is the first step in isolating the variable?

A Add 12 to both sides
B Multiply both sides by $\frac{1}{4}$
C Subtract 12 from both sides
D Subtract 2 from both sides

Name_____ Date _____ Class_____

83. The chart shows the scores for four teams in four games. What is the relationship between the team with the highest mean score and the team with the highest total score?

Team	A	B	C	D
Game 1	4	4	1	5
Game 2	3	4	1	2
Game 3	2	2	3	4
Game 4	4	1	2	3

A They are always the same team.
B They are never the same team.
C They are sometimes the same.
D There is no relationship.

84. Arthur does freelance work as an editor. He charges a set-up fee of $35.00, and $25.00 per hour. Which expression describes the cost in dollars of a job that takes Arthur h hours?

A $(35 + 25)h$
B $25h + 35$
C $35h + 25$
D $25h + 35h$

85. The heights in feet of several dams are shown in the chart.

El Cajon	Luzzone	Ertan
768 ft	738 ft	787 ft

With a height of 778 feet, where does La Esmerelda Dam fall in a list of the dam's heights from least to greatest?

A first
B second
C third
D fourth

86. The perimeter of a football field is $346\frac{2}{3}$ yards. The length is $66\frac{2}{3}$ yards longer than the width. What is the width of the field?

A 40 yards
B $53\frac{1}{3}$ yards
C $53\frac{2}{3}$ yards
D $62\frac{1}{3}$ yards

87. Which set of data does NOT represent a direct variation?

A

x	*y*
2	8
4	16
9	36

B

x	*y*
1	25
2	100
5	900

C

x	*y*
12	5
4	1
6	−4

D

x	*y*
−6	40
5	−26
11	−62

88. Add.

$$\begin{array}{r} 2594.98 \\ +\ (-\ 489.13) \\ \hline \end{array}$$

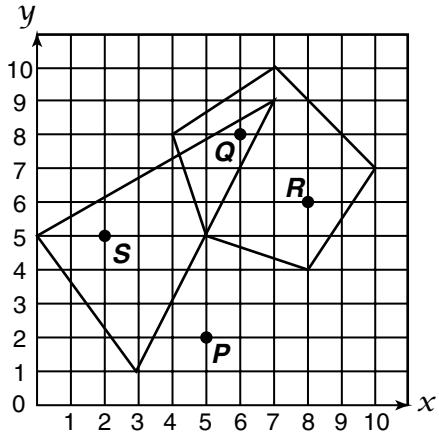
A −2,105.85
B −1,816.01
C 2,105.85
D 2,210.81

Name_____ Date _____ Class_____

89. The Wong family bought 2 adult tickets and 4 student tickets for a concert. One adult ticket costs $28. The total cost of the tickets without tax was $120. What is the price of one student ticket?

A $12
B $14
C $16
D $20

90. Which point is located at the coordinates (5, 2)?



A Point *P*
B Point *Q*
C Point *R*
D Point *S*

91. Subtract.

$$\begin{array}{r} -6{,}449 \\ -\ 2{,}213 \\ \hline \end{array}$$

A −8,662
B −4,236
C 4,236
D 8,862

92. Which expression best represents the distance from 0 to 1,400 on a number line?

A −1,400
B −|1,400|
C |1,400|
D −|−1,400|

93. If two equilateral triangles are similar and have a ratio of 3:2, how long are the sides of the smaller triangle if the larger triangle has sides that are 12 cm long?

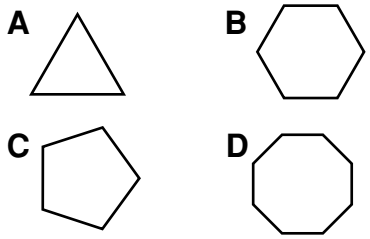
A 4 cm
B 6 cm
C 8 cm
D 24 cm

Name_____ Date _____ Class _____

SAMPLE TEST B

Select the best answer for each question.

1. Which figure does NOT look the same after a reflection across a vertical line?



2. Multiply.

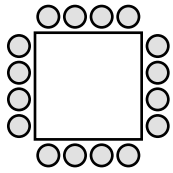
$$\begin{array}{r} -78.9 \\ \times \quad 24 \\ \hline \end{array}$$

A −1,893.6
B −1,719.6
C 1,675.4
D 1,893.6

3. The lengths of corresponding sides of similar rectangles have a ratio of 7 : 4. The perimeter of the smaller rectangle is 80 ft. What is the perimeter of the larger rectangle?

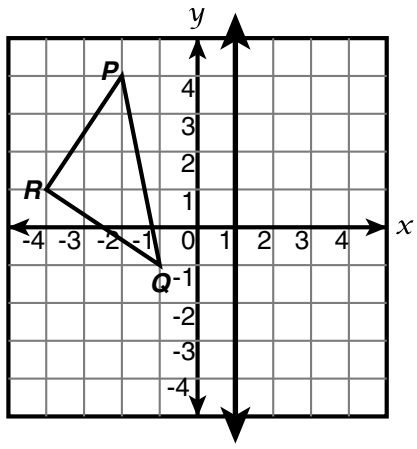
A 40 ft
B 90 ft
C 140 ft
D 160 ft

4. A conference room has 4 square tables that seat 16 people each. How many people can be seated if 4 tables are put together to form a larger square?



A 32
B 36
C 48
D 64

5. Where will point *Q* be after the triangle is reflected across the *x*-axis and then reflected across the vertical line through (1, 0)?



A (−1, 1)
B (3, −1)
C (3, 1)
D (4, −4)

Name_____ Date _____ Class_____

6. Which shows the numbers $\frac{8}{10}$, $-\frac{9}{10}$, -0.65, $\frac{5}{6}$,and -0.08 in order from least to greatest?

A $-\frac{9}{10}, -0.65, -0.08, \frac{8}{10}, \frac{5}{6}$

B $-0.08, -0.65, -\frac{9}{10}, \frac{5}{6}, \frac{8}{10}$

C $-0.08, -0.65, \frac{5}{6}, \frac{8}{10}, -\frac{9}{10}$

D $-\frac{9}{10}, -0.08, -0.65, \frac{8}{10}, \frac{5}{6}$

7. Will took two tests and got 83% and 93%. What does Will have to get on the next test to have a mean score of 88%?

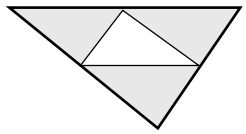
A 88%

B 93%

C 95%

D 100%

8. What transformation will make the black triangle at the bottom of the figure coincide with the white triangle in the center?



A reflection across a vertical line

B rotation of 90°

C rotation of 180°

D reflection across a horizontal line

9. Which of the following correctly combines these terms?

$-3a + 2b - (-7a) + 3b - 2c$

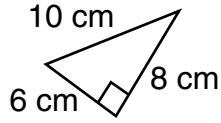
A $-4a - 5b + 2c$

B $4a + 5b - 2c$

C $6abc$

D $8 + 2abc$

10. Glenda enlarged the triangle so that the ratio of corresponding sides is 3 : 2. How long is the new hypotenuse?



A 5 cm

B 12 cm

C 15 cm

D 20 cm

11. The Glitz Hotel charges $179.93 per night for a double room. The Jarvis family occupied 3 double rooms for 2 weeks. Which was their total bill for their stay?

A $719.12

B $3,778.53

C $4,560.86

D $7,557.06

Name_____ Date _____ Class _____

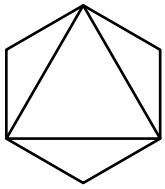
12. Which of the following three-dimensional figures has the most vertices?

A cone
B rectangular prism
C pentagonal pyramid
D triangular prism

13. The value of y varies directly with x, and $y = -12$ when $x = 6$. What is the value of y if $x = 18$?

A -36
B -6
C 12
D 36

14. How many times will the figure show rotational symmetry within one full rotation?

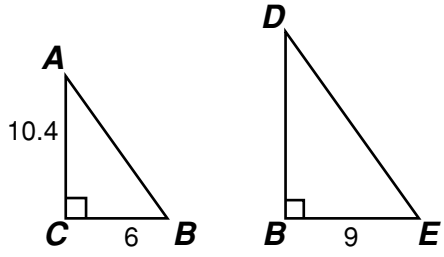


A 1 time
B 2 times
C 3 times
D 6 times

15. A technician scoops out 25 gallons of a chemical from a container containing 300 gallons of the chemical. Which equation can be used to find how much of the chemical remains?

A $25c = 300$
B $300 \div 25 = c$
C $c - 25 = 300$
D $300 - 25 = c$

16. Triangle ABC is similar to triangle DBE. What is the length of $\overline{DE}$?



A 6.93
B 12.6
C 13.4
D 18.01

17. Which one of the following equations does NOT have a solution of 12?

A $3 - n = -9$
B $4 = \frac{48}{n}$
C $35 + n = 48$
D $11n = 132$

Name_____ Date _____ Class_____

18. Which method of organizing data could show the percentage of the total US population that lives in New England?

A stem-and-leaf
B histogram
C line graph
D circle graph

19. Which expression is NOT equivalent to the absolute value of −99?

A $-(-99)$
B $|-99|$
C 99
D $-|99|$

20. What value of y makes the equation true?

$$x + 451.09 = -971.03$$

A −1,422.12
B −519.94
C 509.49
D 1,398.12

21. Which three-dimensional figure CANNOT have any parallel faces?

A cube
B pyramid
C prism
D cylinder

22. The average monthly rainfall in inches for two cities is given below.

Average Monthly Rainfall (inches)

Month	J	M	M	J	S	N
City A	3.6	4.9	5.2	3.6	4.1	5.2
City B	0	0	0.8	37.2	12.2	0.3

Which is a true statement about the cities?

A The range of City A's average rainfall is less than the range of City B's average rainfall.
B The mean of City A's average rainfall is greater than the mean of City B's average rainfall.
C The median of City A's average rainfall is less than the median of City B's average rainfall.
D The mode of City A's average rainfall is equal to the mean of City B's average rainfall.

23. Which of the following shows the decimals in order from least to greatest?

A 0.506, 0.06, 0.0076, 0.66
B 0.0076, 0.06, 0.506, 0.66
C 0.66, 0.06, 0.0076, 0.506
D 0.06, 0.506, 0.6, 0.0076

Name_____ Date _____ Class_____

24. What is the value of x in

$$6x - 5 = 30 + x?$$

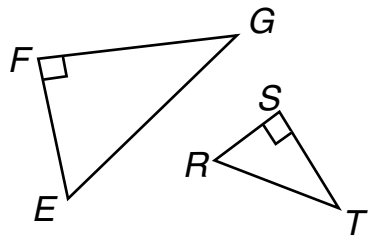
A 4.5

B 7

C 12

D 15

25. If $\angle R = 60°$, what is $\angle E$?



A 30°

B 60°

C 120°

D There is not enough information to solve the problem.

26. The diameter of a ripple in water increases in a constant rate. After 3 seconds, the diameter is 8.5 in. After how long will the diameter be 62.5 in.?

A 12 seconds

B 22.1 seconds

C 31.5 seconds

D 45 seconds

27. If data set A has a greater mean than data set B, which of the following must be true?

A Each item in set A has a greater value than the corresponding item in set B.

B Set A has a greater median than set B.

C Set A has a greater mode than set B.

D There is at least one value in set A that is greater than at least one value in set B.

28. Which figure will look the same after a rotation of 72°?

A isosceles triangle

B regular pentagon

C regular hexagon

D circle

29. Which can be solved by

$$50 - 37.5 = x?$$

A Helen bicycled 17.5 miles from her house to Ken's house, then 20 miles to Eddie's house. How far did she bicycle in all?

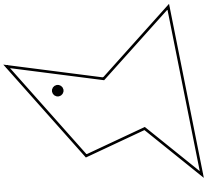
B Jane needs to cut 50 pieces of 37.5 inch ribbon. How much ribbon will she need in all?

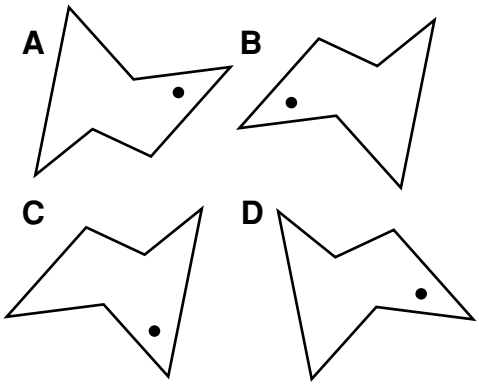
C Dave bought a belt for $37.50. How much will two of them cost?

D Alfredo bought a video game for $37.50. How much change will he get from $50.00?

Name_____ Date _____ Class_____

30. What does the figure look like after a reflection across a horizontal line?





31. Tomas is borrowing $1,000 for 6 months. The loan company charges 7.5% yearly interest. Which formula can be used to find the interest Tomas will owe?

A $I = 500 \times 7.5 \times 365 \div 2$

B $I = 1000 \times 0.75 \times 6$

C $I = \dfrac{(1000 \times 0.075)}{2}$

D $I = 1000 + 0.075 \times 50 \times 2$

32. An adult giraffe is about $17\frac{6}{25}$ ft tall. Sergei Bubka of the Ukraine holds the world record in the pole vault with a vault of $21\frac{49}{125}$ ft. How much higher is the world record vault than the height of an adult giraffe?

A $4\frac{19}{125}$ feet **B** $4\frac{43}{125}$ feet

C $4\frac{43}{100}$ feet **D** $3\frac{106}{125}$ feet

33. In a sample of voters in Division Falls, 17 out of 20 favored building a new library. If 75,000 people vote in the next election, how many are likely to vote in favor of the new library based on this sample?

A 11,250 **B** 28.500

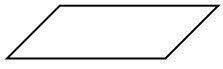
C 63,750 **D** 70,000

34. There are 126 students in 4 seventh-grade classes. Three classes each have 31 students. How many students are in the fourth class?

A 31 **B** 32

C 33 **D** 34

35. How many lines of symmetry does this figure have?



A 2

B 1

C 0

D 4

36. Which equation shows the relationship between x and y in this table?

x	*y*
3	20
6	10
12	5

A $y = \dfrac{x}{60}$

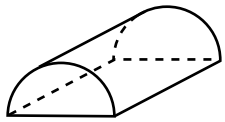
B $y = 12x$

C $y = \dfrac{60}{x}$

D $y = 60x$

Name_____ Date _____ Class_____

37. What shape is the base of this figure?



A square
B rectangle
C circle
D rhombus

38. Sue wants to solve the following equation:

$$\frac{x}{8} + 12 = 6$$

What step should she take first?

A Multiply both sides by 8.
B Subtract 12 from both sides.
C Add 6 to both sides.
D Divide each side by 8.

39. The table shows the temperature at noon in Buffalo, New York, over 5 days. Between which two days is the amount of change least?

Day	1	2	3	4	5
Temp.	1°	7°	−1°	2°	0°

A Day 1 and Day 2
B Day 2 and Day 3
C Day 3 and Day 4
D Day 4 and Day 5

40. An octagon has a pair of horizontal parallel sides. The octagon is rotated 90°. What is the result?

A It will have no parallel sides.
B It will have sides perpendicular to each other.
C It will have a pair of vertical parallel sides.
D It will have a pair of horizontal parallel sides.

41. Anita owns three brown skirts, w white skirts, and two red skirts. Which equation shows how to find how many white skirts she owns if she owns eight skirts in all?

A $3 + w + 8 = 2$
B $3 + 2 + 8 = w$
C $3w + 2 = 8$
D $3 + w + 2 = 8$

42. Harry noticed that during the day, the temperature decreased. Which is true about the line of best fit for the data shown in a scatter plot?

A The line falls from left to right.
B The line rises from left to right.
C The line is horizontal.
D The line rises, then falls from left to right.

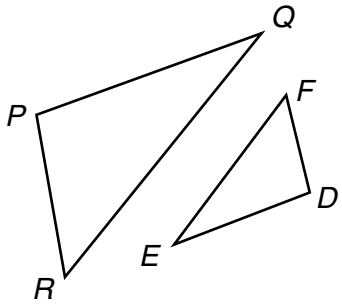
43. Add.

$$\begin{array}{r} -678 \\ +\ (-679) \\ \hline \end{array}$$

A −1,357
B −1
C 1
D 1,357

Name_____ Date _____ Class_____

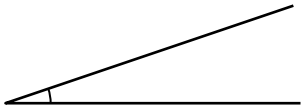
44. These triangles are similar. You know *FD* and want to find *PR*. Which two lengths can you use to solve the problem?



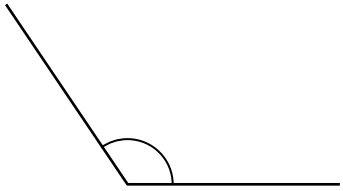
A *ED*, *EF*
B *RQ*, *EF*
C *RQ*, *ED*
D *PQ*, *EF*

45. Which of the following is a 124° angle?

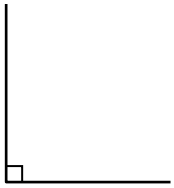
A



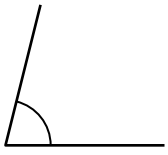
B



C



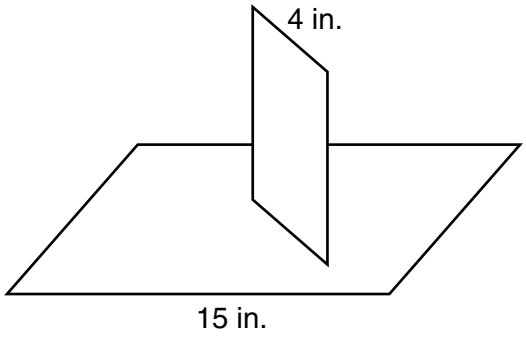
D



46. An electrician charges customers $38 per hour plus an additional $15 for travel each way. If *h* represents the number of hours worked, which of the following expressions could be used to calculate the electrician's total charge in dollars?

A $\frac{38 \cdot h}{15 \cdot 2}$
B $(38 \cdot h) + (15 \cdot 2)$
C $(38 \cdot 2) + (15 \cdot h)$
D $\frac{38}{h} \div 15 \cdot 2$

47. These two similar rectangles have a side ratio of 2:1. What is the longer side in the smaller shape?



A 2 inches
B 8 inches
C 7.5 inches
D 30 inches

48. Sammy visited 15 local stores that sell video games. He recorded the prices of one specific video game. Which of the following measures would best describe the average price someone might expect to pay for the video game?

A mean
B median
C mode
D range

Name_____ Date _____ Class_____

49. Franca's bank statement is shown below. If her beginning balance was $45.43, what is her ending balance?

Bank Statement

Date	Transaction	Amount
Jan. 3	Deposit	$232.94
Jan. 8	Deposit	$73.65
Jan. 22	Withdrawal	$146
Feb. 6	Withdrawal	$54
Feb. 18	Deposit	$256.12

A $210.12
B $390.98
C $408.14
D $523.34

50. Jesse weighed his pet mouse in grams every Sunday. After six weeks his chart showed: 20, 22, 25, 29, 32, 34. How many times did the mouse's weight increase 2 grams from the previous week's weight?

A once
B twice
C three times
D five times

51. Which of the following figures has exactly 3 lines of symmetry?

A square
B ellipse
C circle
D equilateral triangle

52. Which of the following equations represents an inverse variation?

A $y = 3x$
B $y = \frac{45}{x}$
C $y^3 = x$
D $3y = 4x$

53. Fiona plotted $(-4, 1)$, $(-4, 4)$, and $(-2, 4)$ on a coordinate grid. She needs to graph one more ordered pair in order to connect the points to make a trapezoid. Which ordered pair will NOT complete a trapezoid?

A $(-2, 0)$
B $(-1, 1)$
C $(0, 1)$
D $(-2, 1)$

54. Which of the following correctly combines these terms?

$$25x + 8y + (-7x) - 2y + 9x$$

A $20x$
B $6x - 2y$
C $12xy$
D $27x - 6y$

55. When ordering the fractions $\frac{1}{6}$, $\frac{3}{8}$, $\frac{4}{5}$, and $\frac{5}{16}$, which common denominator should be used?

A 40
B 80
C 240
D 720

Name_____ Date _____ Class_____

56. The data below are the ages in years of the students in two different focus groups.

Group I:	11	12	13	13	14	14	14
Group II:	11	11	11	12	13	13	14

Which of the following measures are the same for both groups?

A the mean, median, and mode
B only the mean and median
C only the median and mode
D none are the same

57. Which shape will NOT look the same following a 180° turn?

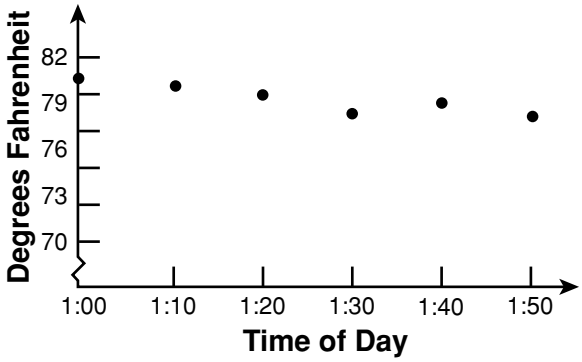
A circle
B square
C rectangle
D equilateral triangle

58. Find the value of d that makes the equation true.

$$d \div (-8) = -14$$

A −112
B 96
C 112
D 150

59. The scatter plot shows temperature readings. If the trend continues, Predict the temperature at 2:00.



A 70°F
B 76°F
C 82°F
D 94°F

60. Sam followed this recipe:

Trail Mix

$1\frac{2}{3}$ cups raisins

$1\frac{3}{4}$ cups nuts

2 cups dry cereal

How much trail mix did Sam make?

A $4\frac{5}{12}$ cups
B $4\frac{5}{7}$ cups
C $4\frac{2}{3}$ cups
D $5\frac{5}{12}$cups

Name_____ Date _____ Class _____

61. Yesterday Rosita rode her bike $2\frac{1}{4}$ miles. Today she rode one and one-third times as far. How far did Rosita ride today?

A $\frac{3}{4}$ mile

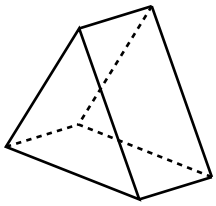
B $1\frac{1}{12}$ miles

C $1\frac{11}{16}$ miles

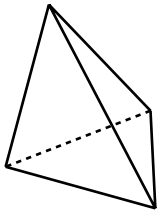
D 3 miles

62. Which three-dimensional figure has the most faces?

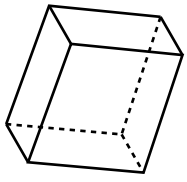
A



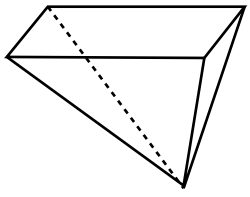
B



C



D



63. Five people are asked to try a new mouthwash. Two of them like it. What is the best conclusion?

A The mouthwash is good.

B More people should be asked.

C The mouthwash should be improved.

D Individual reports are unreliable.

64. Jorge gets $9 per hour for babysitting. Tiffany gets $15 plus an hourly rate that is $2 per hour less than Jorge's. If h represents the number of hours babysat, which equation gives Tiffany's pay p?

A $p = 9(h - 2) + 15$

B $p = h + (15 - 9)$

C $p = (15 + 9 + 1)h$

D $p = (9 - 2)h + 15$

65. How many lines of symmetry does a regular octagon have?

A 4

B 8

C 16

D 64

66. What is the range of this set of data?

12, 14, 15, 15, 17, 19, 25

A 13

B 15

C 16

D 25

67. What is the size of the angle formed from bisecting an interior angle of an octagon?

A 36°

B 67.5°

C 72°

D 108°

Name_____ Date _____ Class_____

68. Ty is a salesman. His weekly salary is a percentage of his sales for that week. On Monday, Ty's sales totaled $3,000. Over the next 4 days, he sold $\frac{1}{2}$ as much each day than the previous day. If Ty's salary for the week was $1950.75, what percent of his sales did Ty earn?

A 21%
B 27%
C 34%
D 40%

69. The table below shows the *x*- and *y*-coordinates of some ordered pairs.

x	4	7	12	17
y	10	22	42	62

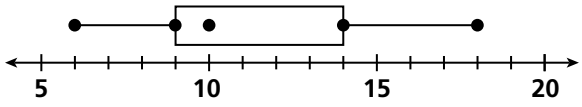
Which equation describes the relationship of the *x* values to the *y* values?

A $y = 2x + 1$
B $y = 11(x - 3)$
C $y = 4x - 6$
D $y = x^2 - 3$

70. The side lengths of triangle *GHI* are 6 cm, 9 cm, and 12 cm. Which could NOT be the side lengths of triangle similar to triangle *GHI*?

A 2 cm, 3 cm, and 4 cm
B 4 cm, 6 cm, and 8 cm
C 9 cm, 13.5 cm, and 18 cm
D 12 cm, 18 cm, and 27 cm

71. What is the range of the data set display in the box and whisker plot?



A 6
B 10
C 12
D 18

72. Ships that travel from Factor Lake to Twelve Acre Lake pass through Box Canal. At Lock 1, the ship was 75.73 feet below the level of Factor lake. At Lock 3, the ship was 21.546 feet above the level of Factor Lake. What is the change in altitude between Lock 1 and Lock 3?

A −92.276 feet
B $-|-92.276|$ feet
C 92.276 feet
D $-|92.276|$ feet

73. What is the value of the expression $4x^2 - 3y$ when $x = 6$ and $y = 8$?

A 34
B 144
C 120
D 552

Name_____ Date _____ Class _____

74. Which direction will the arrow face after a $1\frac{1}{4}$ turn clockwise?

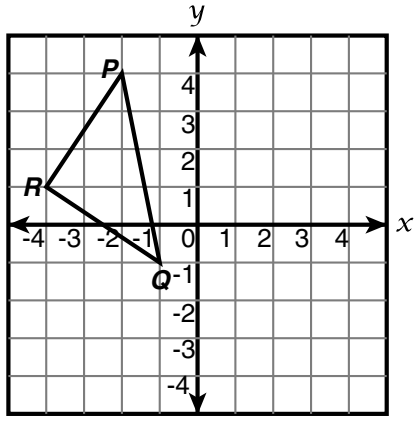
A up
B down
C right
D left

75. Ramon is shopping for a new bike. He found the bike at four different stores. Which store will give Ramon the best deal on that particular bike?

Store	Regular Price	Sale
Biketown	$275.00	$50.00 off
Cyclone Cycles	$300.00	15%
Wheeler's Bicycles	$325.00	$\frac{1}{3}$ off
Spokes	$250.00	25% discount

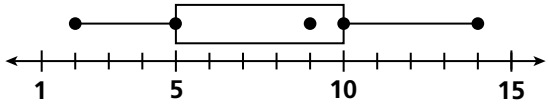
A Biketown
B Cyclone Cycles
C Wheeler's Bicycles
D Spokes

76. What are the coordinates of point *R* after the triangle is rotated 90° clockwise about the origin?



A (−1, −4)
B (0, 4)
C (−1, 4)
D (1, 4)

77. What is the median of the set of data displayed in the box and whisker plot?



A 2
B 4
C 9
D 10

Name_____ Date _____ Class_____

78. To welcome her class to the new school year, Mrs. Akers made each student a bookmark. For each bookmark, she used 3 strands of ribbon that were each $8\frac{5}{16}$ inches long. For the 33 students in her class, how much ribbon did she use in all?

A $24\frac{15}{16}$ inches

B 68 feet, $6\frac{3}{4}$ inches

C $274\frac{5}{16}$ inches

D $822\frac{15}{16}$ inches

79. Use the information in the table below to answer the question.

2000 Census Data for Harlan County

Gender	Total
Females	15,500
Males	29,040

What expression can be used to find the total population of Harlan County?

A $15{,}500 + x = 29{,}040$

B $29{,}040 - 15{,}500 = x$

C $15{,}500 - x = 29{,}040$

D $15{,}500 + 29{,}040 = x$

80. Which statement is true?

A The number of lines of symmetry of a polygon is always equal to the number of sides.

B All quadrilaterals have at least one line of symmetry.

C The image of a shape reflected over its line of symmetry is congruent to the shape.

D A quadrilateral can have at most two lines of symmetry.

81. Which of the following equations represents a direct variation?

A $y = 4x$

B $3y + 2x = 7$

C $y = \frac{34}{x}$

D $y - x = 12$

82. A grocery store sells cereal in several different sizes. Which shows the order of the sizes in pounds from least to greatest?

A $\frac{13}{8}$, 1.49, $\frac{17}{12}$

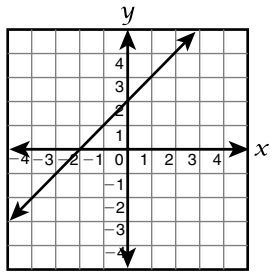
B $\frac{13}{8}$, $\frac{17}{12}$, 1.49

C $\frac{17}{12}$, $\frac{13}{8}$, 1.49

D $\frac{17}{12}$, 1.49, $\frac{13}{8}$

Name_____ Date _____ Class_____

83. Which could be the coordinates of the point where the line crosses the *y*-axis?



A $\left(\frac{5}{2}, 0\right)$

B $(0, -2)$

C $(-2, 0)$

D $\left(0, \frac{5}{2}\right)$

84. Which group would be the best random sample of students in a particular junior high school?

A The tallest student in each homeroom class.

B Students with the last name Jones.

C The first student you see at noon everyday for a week.

D Every 3rd student to arrive at school on Tuesday morning.

85. Which equation best represents the *y* values in terms of the *x* values?

x	1	2	3	4	5	6
y	2	6	10	14	18	22

A $y = x + 4$

B $y = 2x$

C $y = 4x - 2$

D $y = \frac{(x + 2)}{4}$

86. Which of the following would NOT be a good way to show the approximate average income in 8 different countries?

A bar graph

B circle graph

C histogram

D stem and leaf plot

87. Add.

$$\begin{array}{r} -1495.91 \\ +\ 809.13 \\ \hline \end{array}$$

A −2,305.04

B −686.78

C 686.78

D 2,305.04

Name_____ Date _____ Class_____

88. The Ward family bought 1 adult ticket and 3 student tickets for a concert. The student tickets cost $14 each, and they spent a total of $62. What is the price of the adult ticket?

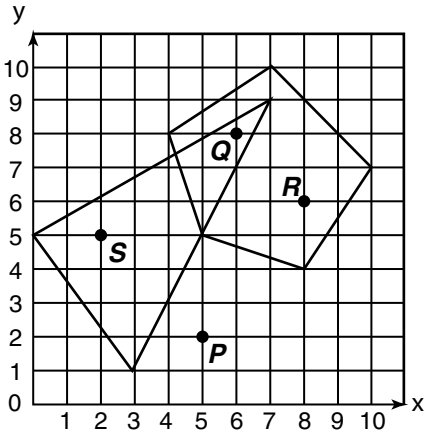
A $12

B $14

C $16

D $20

89. Which point is located at the coordinates (6, 8)?



A Point *S*

B Point *P*

C Point *R*

D Point *Q*