Math Review & Testing Tips

You CAN do it!

Percent to Decimal, and Decimal to Percent

- Always move 2 Places! How many places? 2!
- You BETTER Write D and P on your paper!
- D comes before P in the Alphabet!

FROM Percent TO Decimal

D  P

FROM Decimal TO Percent

D  P

1. Which answer is .87 written as a percent?

A. .87%
B. 8.7%
★ C 87%
D. 870%

Exponents

- 8^2 is 8 times 8, NOT 8 times 2!
- You BETTER use your calculator: 8 ^ 2 = 64
- Try EVERY answer choice – which one works?

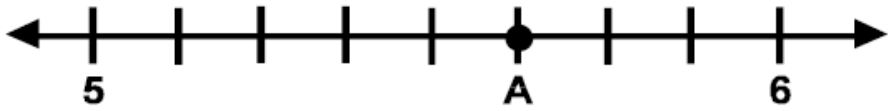
2. What is another way to express 64?

★ A. 8^2
B. 3^4
C. 6^4
D. 6.4×10^2

Number Line - Fractions

- Look at the question below.
- How many SPACES are between 5 and 6? 8 Each space is 1/8
- How many spaces are between the 5 and A? 5
- So there are 5 eighths between the 5 and A.
- You may have to simplify or reduce the fraction: 4/8 equals 1/2 (divide the numerator and denominator by the same number)

3. Which answer shows the number that point A represents on the graph?



A. $5\frac{1}{2}$

★ B. $5\frac{5}{8}$

C. $5\frac{3}{4}$

D. $6\frac{1}{4}$

Time and Fractions

- Look at the question below.
- How many minutes are in an hour? 60
- Look at the denominator (bottom part of the fraction)
- The questions is asking about fourths, so DRAW a rectangle on your paper and make for sections like this 
- If you need to divide 60 minutes into fourths, how many minutes will go into each box? 15
- ¼ hour = 15 minutes
- 2/4 hour (1/2 hour) = 30 minutes
- ¾ hour = 45 minutes

Angelica read to her brother for $\frac{1}{4}$ of an hour. How many minutes did she read?

A. 4
★ B. 15
C. 25
D. 40

Discount

- **READ the questions VERY, VERY Carefully.**
- **Look at the question below**
- **WHAT is the question asking? What is the amount of the DISCOUNT**
- **In calculator, 24 x 25% (use percent key) = 6**
- **Ask yourself – Does this answer make sense?**
- **If the question asks for the sale price:**
  original price – discount = sale price

If shoes which originally cost $24.00 are selling at a 25% discount, what is the amount of the discount?

★ A. $6.00
B. $8.00
C. $12.00
D. $18.00

Interest

- **READ the questions VERY, VERY Carefully.**
- **Look at the question below.**
- **WHAT is the question asking? What is the amount of the INTEREST**
- **In calculator, 6000 x 13% (use percent key) = 780**
- **Ask yourself – Does this answer make sense?**
- **If the question asked for the total amount paid:**

  Cost of the car + interest = total amount paid

If Juanita borrows $6,000 to buy a car at a fixed interest rate of 13% per year, how much interest must she pay if she pays the loan in full at the end of one year?

A. $78
B. $565
★ C. $780
D. $6013

Sales tax

- **READ the questions VERY, VERY Carefully.**
- **Look at the question below.**
- **WHAT is the question asking? What is the amount of the TAX**
- **In calculator, 18.5 x 6% (use percent key) = 1.11**
- **Ask yourself – Does this answer make sense?**
- **If the question asked for the total amount paid:**

  Purchase price + tax = total amount paid

Maureen works in a small crafts store where the cash register does not compute the sales tax. If the sales tax is 6%, what amount should Maureen add to a purchase of $18.50?

A. $0.06
B. $0.55
★ C. $1.11
D. $1.85

Estimates - percentages

- **READ the questions VERY, VERY Carefully.**
- **Look at the question below.**
- **WHAT is the question asking? What is the amount of the TIP**
- **You BETTER use your calculator!**
- **In calculator, 14.00 x 15% (use percent key) = 2.1 ($2.10)**
- **Ask yourself – Does this answer make sense?**
- **With ESTIMATES, do the calculation on the calculator, and pick the answer that is CLOSEST.**

What is the **best** estimate of a 15% tip on a $14.00 meal?

A. $1.00
B. $1.40
★ C. $2.00
D. $2.80

Estimates - average

- **READ the questions VERY, VERY Carefully.**
- **Look at the question below.**
- **WHAT is the question asking? What is the AVERAGE**
- **You BETTER use your calculator!**
- **AVERAGE means ADD up the items, then DIVIDE by the NUMBER of items**
- **In calculator, 95+90+75+80+90+90 = 520 Now: 520 / 6 = 86.66**
- **With ESTIMATES, do the calculation on the calculator, and pick the answer that is CLOSEST.**

Masheela's science grades were 95, 90, 75, 80, 90, 90. What is a reasonable estimate of her average grade in science?

A. 95
B. 90
★ C. 85
D. 80

Estimates

- **READ the questions VERY, VERY Carefully.**
- **Look at the question below.**
- **WHAT is the question asking? What is the SUM**
- **You BETTER use your calculator!**
- **ADD up the items**
- **In calculator, 62+59+55+67+61= 304**
- **With ESTIMATES, do the calculation on the calculator, and pick the answer that is CLOSEST.**

Estimate the sum of 62, 59, 55, 67, and 61.

★ A. 300
B. 305
C. 400
D. 500

Probability

- All of the possible combinations are on the far right-hand side.
  - All three heads is HHH and all three tails is TTT
  - Make a fraction with the total number of outcomes as the denominator (bottom part of the fraction)
    - 2/8 Simplify to 1/4

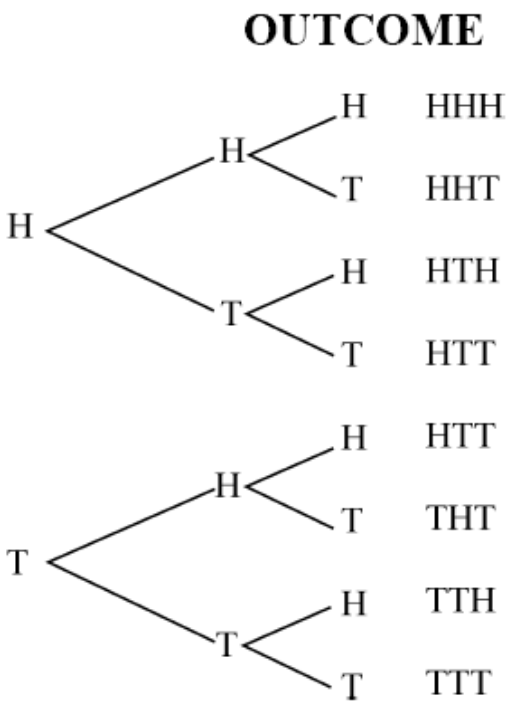
Use the tree diagram to predict the probability of flipping three coins and getting all heads or all tails.

★ A. $\frac{1}{4}$

B. $\frac{1}{2}$

C. 1

D. 2



Probability

•The probability of tossing a coin and getting heads is 1/2 , no matter what the previous outcomes were.

If a coin is tossed five times and on the first four tosses it comes up tails, what is the probability of getting heads on the fifth toss?

A. 0

★ B. $\frac{1}{2}$

C. $\frac{4}{5}$

D. 1

Probability

- **Read the question several times, and write down notes**
- **5 pencils total; some red – some blue**
- **3 out of 5 chance of getting a red, so 3 out of 5 must be red.**
- **5-3 is 2, so 2 of the pencils must be blue**

There are five pencils in a box; some are red and some are blue. The probability of randomly reaching into the box and selecting a red pencil is $\frac{3}{5}$. How many blue pencils are in the box?

A. 1
★ B. 2
C. 3
D. 5

Graphs

- **Circle graphs – Parts of a whole or percentages – circle adds up to 100%**
- **Bar graphs – shows categories like favorite color**
- **Line graphs – shows changes over time**

Which kind of graph is **best** used to show a percent or share of the total?

A. bar graph
★ B. circle graph
C. line graph
D. pictograph

Pictographs

- Pictographs use pictures to represent numbers
- Look at your data, and then look at the answer choices
  - Choice "A" is too small – You would need 125 pictures to represent seniors
  - Choice "D" is too big – Sophomores and Freshmen both have less than 100

Larami is making a pictograph for the high school newspaper to show the number of students in each grade who are in favor of open lunch. She summarized her data:

Grade	Number of students in favor of open lunch
Seniors	125
Juniors	150
Sophomores	75
Freshmen	50

In the pictograph, how many students could be **best** represented by this symbol?

A. 1
★ B. 25
C. 50
D. 100

Graphs
What kind of graph uses percentages?
CIRCLE GRAPHS!

3. The results of a poll asking, "Who is your favorite late-night talk-show host?" are shown.

Keenan Ivory Wayans 20%
David Letterman 23%
Jay Leno 32%
undecided.....25%

Which type of graph should be used to show the results of the poll?

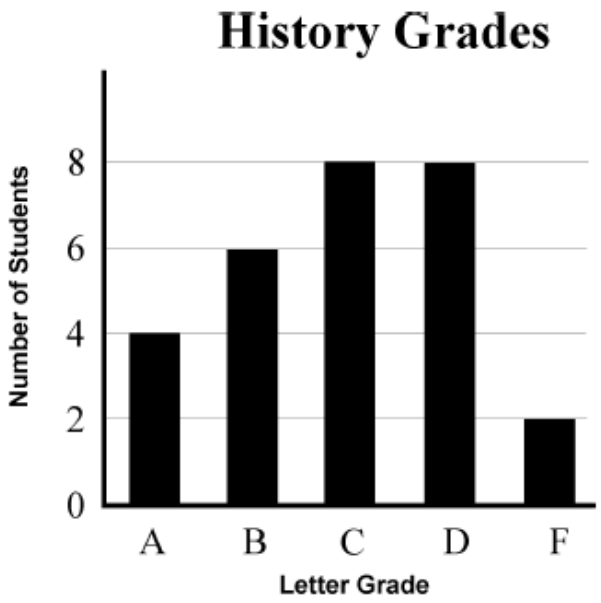
A. bar graph
★ B. circle graph
C. line graph
D. pictograph

Analyzing Graphs

- Read the question very carefully.
- What is the question asking? How many MORE C students than A students are in the class?
  - Count the C students – 8; Count the A students 4 How many more C's? 4

Medium

1.

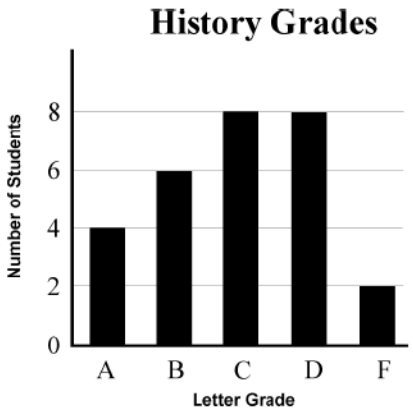


The distribution of grades in Mr. Paul's history class is shown on the graph above. How many more C students than A students are in his class?

A. 0
B. 2
★ C. 4
D. 8

Analyzing Graphs – Ratios

- Remember with ratios that you put them in the same order as the questions asks
- The question is: What is the ratio of A students to C students
  - A goes first, and then C.
  - Number of A's = 4
  - Number of C's = 8 Write it at 4:8 or 4/8 or 4 to 8
  - Simplify (reduce) if needed 4:8 = 1:2



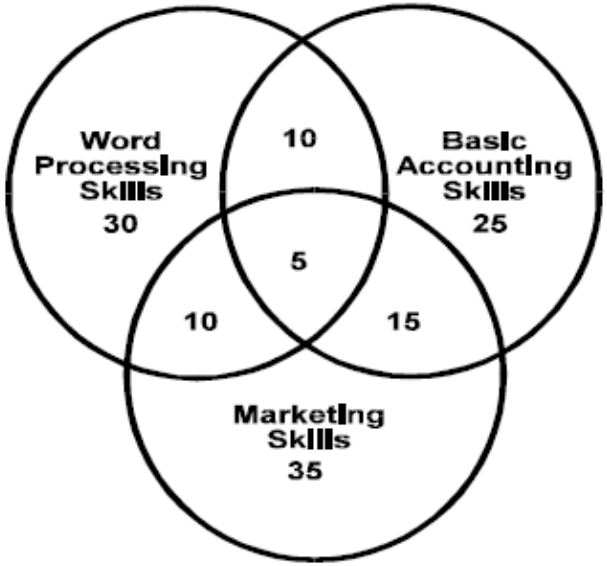
The distribution of grades in Mr. Paul's history class is illustrated by the graph. What is the ratio of A students to C students in his class?

A. 1:4
B. 2:1
★ C. 1:2
D. 4:1

Venn Diagrams

- **Always read the question several times to see what is really being asked.**
- **How many applicants have all 3 skills?**
- **Where they all overlap is in the middle, and that number is 5.**

3. Mr. Mangione, the Director of Human Resources at Ace Chemical Industries, constructed a diagram to illustrate the skills of applicants for positions in the office of his company.



How many applicants possess word processing, basic accounting, and marketing skills?

★ A. 5
B. 10
C. 15
D. 20

Range

- Range is the biggest number – the smallest number.
- If the numbers are not in order, you have to "hunt" for the biggest and smallest numbers
- Biggest = 92
- Smallest = 50
- 92 – 50 = 42

The scores on Mrs. Jackson's physics test were 87, 92, 50, 65, 88, 87, 91, 60, 65, 75, 70, 82, 85, 89, 80, 80, 75, 77, 92, and 80. What is the range of the scores?

★ A. 42
B. 50
C. 78
D. 80

Average

- **Add up the items, and divide by the number of items.**
- **The Average is also called the MEAN.**
- **Check your answer to see if it makes sense. The average should be about the same as the numbers you are adding.**
- **Look at the answer choices. Choice "A" is way too small to be the average of those numbers!**

The Country Coffee Shop has seven employees. Their salaries are $11,000, $12,000, $12,000, $14,000, $16,000, $17,000, and $17,500. What is the average salary of a coffee shop employee?

A. $6,500
B. $12,000
C. $14,000
★ D. $14,214

Averages

- **This is a harder question because it requires several steps.**
- **If she spent an average of 18.78 per shirt for each shirt, then the total for the 6 shirts is 18.78 x 6 = 112.68. The question tells you that she spent $100 for 5 shirts, so subtract the numbers to see what was spent on the 6th shirt.**
- **$112.68 - $100 = 12.68**

Helen spent a total of $100 for five shirts. Later she bought another shirt. She spent an average of $18.78 per shirt for the six shirts. What did Helen pay for the sixth shirt?

★ A. $12.68
B. $16.67
C. $20.00
D. $38.78

Range

- **If you read the question very carefully, you will see that this is a question about range. Range = oldest – youngest. They give you the range and the youngest.**
- **45 = oldest – 13. You can think of it as 45 = x-13 and solve for x**

OR

- **You can check your choices. Which choice – 13 = 45? Try them all.**
- **58-13= 45 so it must be correct**

The youngest person in an audience of 600 people is thirteen years old. The range of ages is forty-five years. Which is the age of the oldest member of the audience?

A. 32 years
B. 45 years
C. 46 years
★ D. 58 years

Distance

- **A centimeter is the size of your pinky fingernail**
- **A meter is close to 3 ft or a yard stick**
- **A millimeter is the thickness of your fingernail (tiny)**
- **A kilometer is a little more than ½ mile, which is a good answer for car traveling.**

1. Juan wants to find the distance from Savannah to Atlanta. Which would be the **best** unit of measurement to use?

   A. centimeter
   ★ B. kilometer
   C. meter
   D. millimeter

Weight

- A gram is the weight of a penny
- A centigram if very small, because there are 100 centigrams in a gram
- A dekagram is about 10 pennies, but it is still pretty light
- A kilogram is about 2 pounds.
- Use kilograms for heavy things and things where you want to use pounds.

To determine the mass of a piano, which is the **most** appropriate unit of measure?

A. grams
B. centigrams
C. dekagrams
★ D. kilograms

Weight

- **Use grams when you want to use ounces**
- **Don't guess hectograms, dekagrams, and decigrams – they are probably not the answer!**

The mass of a can of soda can **best** be measured in

★ A. grams
B. hectograms
C. kilograms
D. milligrams

Weight

- **As an estimate use 1 kilogram = 2 pounds**
- **Now look at your choices 85 x 2 = 170**
- **185 x 2 = 370**
- **170 pounds is the most realistic estimate.**

A good estimate for the weight of a member of a high school football team would be

★ A. 85 kilograms.
B. 185 kilograms.
C. 200 kilograms.
D. 370 kilograms.

Temperature – Celsius

- Read these questions very carefully
- FACT Room temp in Celsius is about 22
- If you want to do the conversion:
  - Room temp in Fahrenheit is about 72
  - First subtract 32 (remember that's the freezing point)
  - Then divide by 9
  - Then multiply by 5
  - 72-32 = 40 40 /9 = 4.4 4.4 x 5 = 22

Given that water boils at 100° C and freezes at 0° C, what would be the **most** comfortable temperature for a room in your home?

A. between 70° C and 80° C
B. between 55° C and 65° C
C. between 40° C and 50° C
★ D. between 20° C and 30° C

Time questions

- **The best way to work these problems is to write down the times in sections**
- **Example Start at 8:30 and end at 3:45**
  - 8:30 – 9:00 = 30 minutes
  - 9 – 10 = 1 hour
  - 10-11 = 1 hour
  - 11 -12 = 1 hour
  - 12- 1 = 1 hour
  - 1-2 = 1 hour
  - 2 – 3 = 1 hour
  - 3:00 – 3:45 = 45 minutes
  - **Add it up: 6 whole hours plus 75 minutes. Since there are 60 minutes in an hour, 75 – 60 = 15 minutes and add the hour to 6 to make 7 hours and 15 minutes BUT she took 30 minutes for lunch, so you have to go back to 6 hours and 45 minutes. Since each 15 minutes is .25, you have 6.75 hours.**

Elizabeth starts work at 8:30 a.m. and stops at 3:45 p.m. If she takes 30 minutes for lunch, what is the length of her work day?

A. 6.0 hours
★ B. 6.75 hours
C. 7.0 hours
D. 7.5 hours

Volume of a cube

- Volume = length x width x height
- In a cube, the length, width, and height are all the same
- Volume = 3 x 3 x 3
- You better write it out and use a calculator
- If you try to do it in your head, you will answer "9 cm"
- 3 x 3 x 3 = 27

What is the volume of a cube that has an edge of 3 centimeters?

A. $3\ cm^3$
B. $9\ cm^3$
C. $18\ cm^3$
★ D. $27\ cm^3$

Weight – Ounces and Pounds

- 16 ounces in a pound!
- 8 ounces in a ½ pound
- 16 ounces = 1 pound
- 16 + 16 = 32, so 32 ounces = 2 pounds
- 32 + 8 = 40, so 40 ounces = 2.5 pounds
- The answer is more than 2.5, but less than 3

If a bag has 45 ounces of bird seed, how many pounds does it contain?

A. between 0.2 and 0.3 pounds
B. between 2.0 and 2.5 pounds
★ C. between 2.5 and 3.0 pounds
D. between 4.0 and 4.5 pounds

Distance

- You could multiply 55 x 2.5 = 137.5 which is close to 140 OR
- You could make a table 55 miles is the distance in 1 hour
- 55 = 1 hour
- 110 miles for 2 hours
- 27.5 miles in ½ hour, so add that to 110. 110 + 27.5 = 137.5

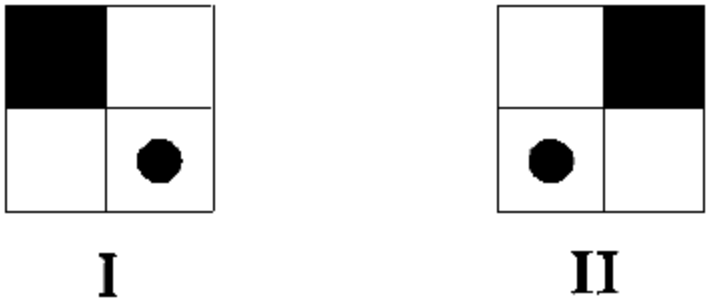
If a car travels at 55 miles per hour, about how many miles will it travel in 2.5 hours?

A. 20 miles
B. 60 miles
C. 110 miles
★ D. 140 miles

Transformations

•Imagine a mirror between the figures. The mirror makes a reflection.
If you have scratch paper, you may want to draw the figures and try to rotate them

Study Figures I and II. Determine which transformation, if any, of Figure I is shown in Figure II?



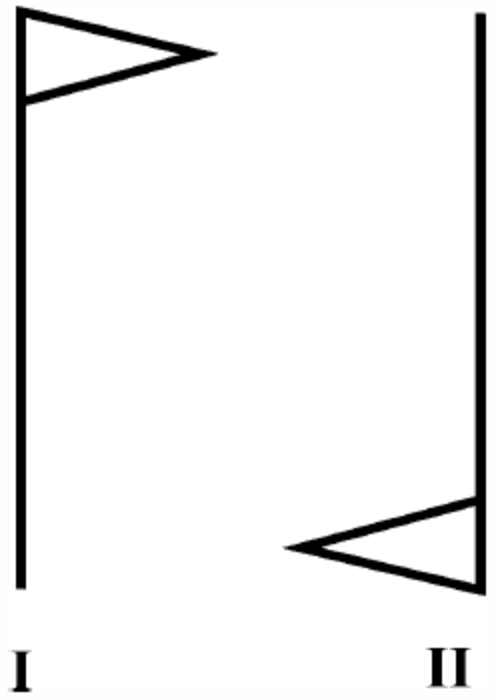
A. rotation
★ B. reflection
C. translation
D. no transformation

Transformations

- If it was a reflection, both of the flags would be at the top, but they would be facing each other.
- Translations look exactly the same, but just "slid" over or up.
- If you imagine the flag as the hands on a clock that rotates clockwise, you would see that the flag matches up when it rotates.

Study figures I and II. Which transformation, if any, of Figure I is shown in Figure II?

A. no transformation
B. reflection
★ C. rotation
D. translation



Transformations

- A "Slide" is a "translation"

Sliding a geometric figure in a straight line is transformation by

A. inversion.
B. reflection.
C. rotation.
★ D. translation.

Similar Figures

- Remember to set up your proportion

- For example $\frac{22}{44} = \frac{13}{X}$ Keep it straight - $\frac{small\ figure}{big\ figure} = \frac{small\ figure}{big\ figure}$

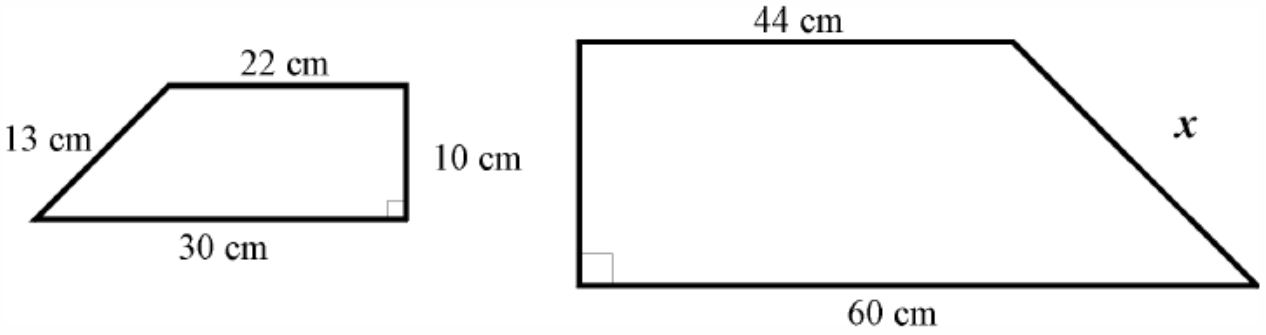
Now solve for x by cross multiplying: $\frac{22}{44} \times \frac{13}{X}$

22x = 572 now divide both sides by 22

x = 26

* Don't forget to match it up – the "x" side is slanted, and the "13" side is slanted, so they go together.

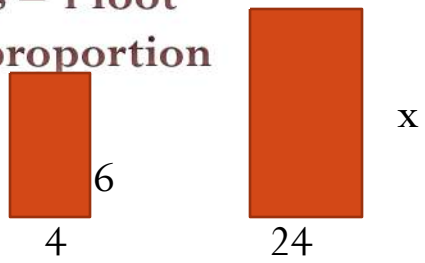
Find the missing length (x) for the pair of similar figures below.



A. 20 cm
★ B. 26 cm
C. 30 cm
D. 39 cm

Measurement word problems

- **DRAW A PICTURE**
- **If you have feet AND inches – convert EVERYTHING to INCHES**
- **12 inches = 1 foot**
- **Make a proportion**



$$\frac{small\ figure}{big\ figure} = \frac{small\ figure}{big\ figure}$$

$$\frac{4}{24} = \frac{6}{X}$$

$$\frac{4x}{4} = \frac{144}{4}$$

$$x = 36 \text{ inches}$$

Henry has a picture that measures 4 inches in width and 6 inches in length. If Henry enlarges the picture to make a poster that measures 2 feet in width, how long will the poster be?

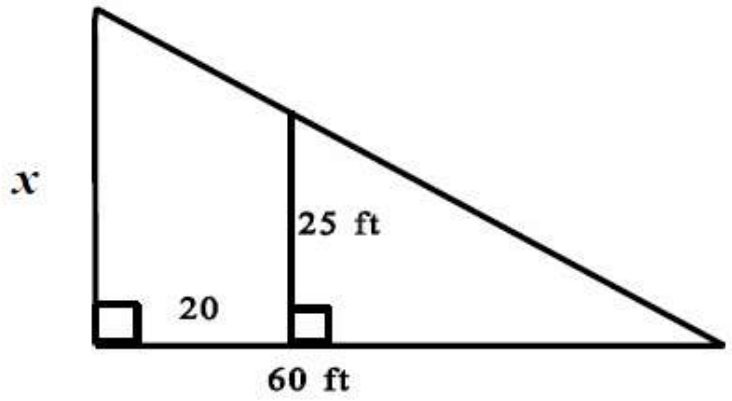
A. 8 inches
B. 12 inches
C. 24 inches
★ D. 36 inches

Similar Triangles

- Sometimes you need to calculate a length $60 - 20 = 40$
- Set up your proportion $\frac{small\ figure}{big\ figure} = \frac{small\ figure}{big\ figure}$ $\frac{40}{60} = \frac{25}{X}$
- You may want to draw the triangles separate to see it.

$40x = 1500\ x = 37.5$

The two right triangles are similar. Find the measure of side x.

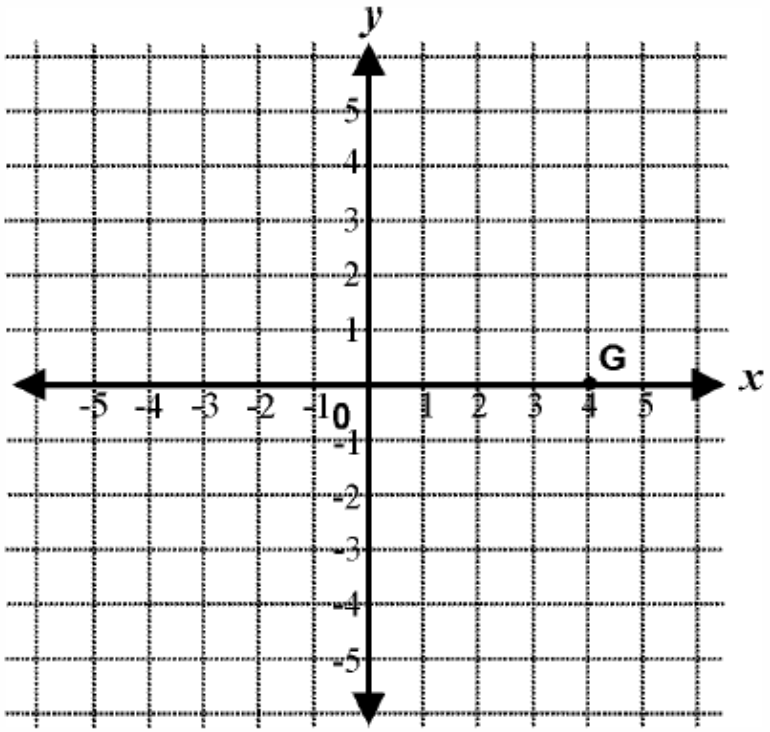


A. 32
★ B. 37.5
C. 55
D. 83

Coordinates

- X is the 1st coordinate. X goes left to right. You count the SPACES.
- You go over 4 and up 0, so the coordinates are (4,0)

1. Give the coordinates of point G on the graph below.

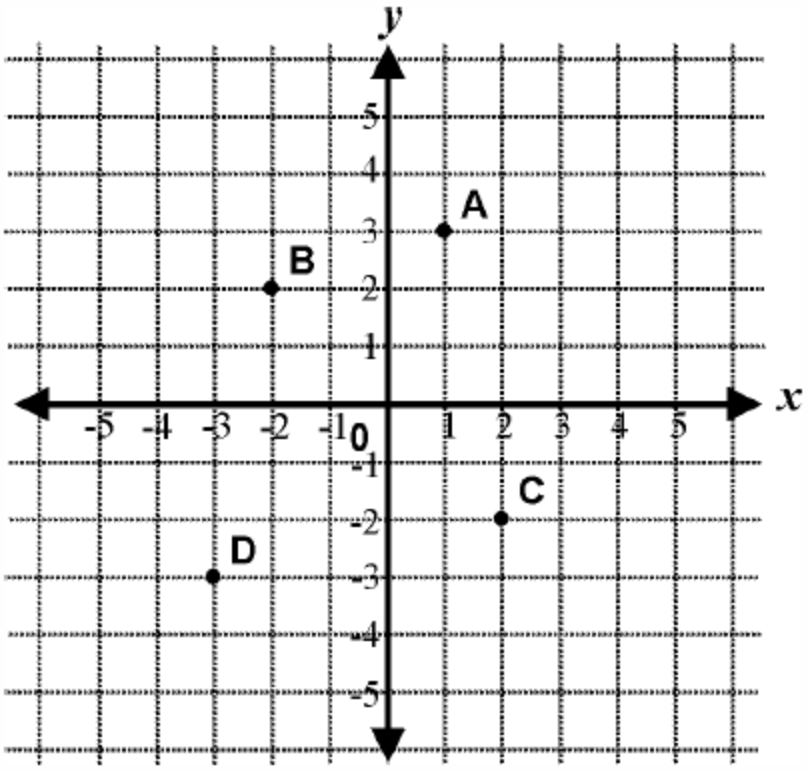


★ A. (0, 4)
B. (0, -4)
C. (4, 0)
D. (-4, 0)

Coordinates

- Go over 2 and down 2

2. Which point shown on the graph below has the coordinates (2, -2)?

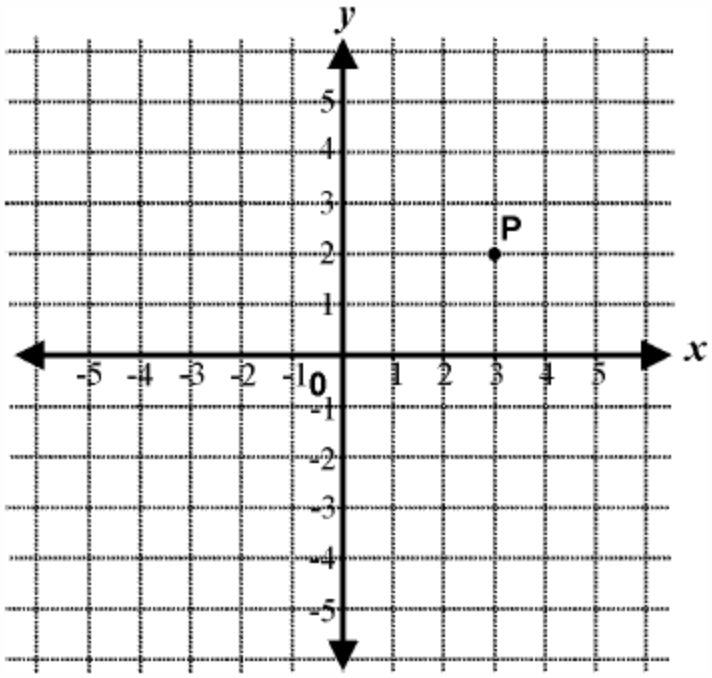


A. point A
B. point B
★ C. point C
D. point D

Coordinates

- To get to P, you go over 3 and up 2

3. Give the coordinates of point P on the graph below.



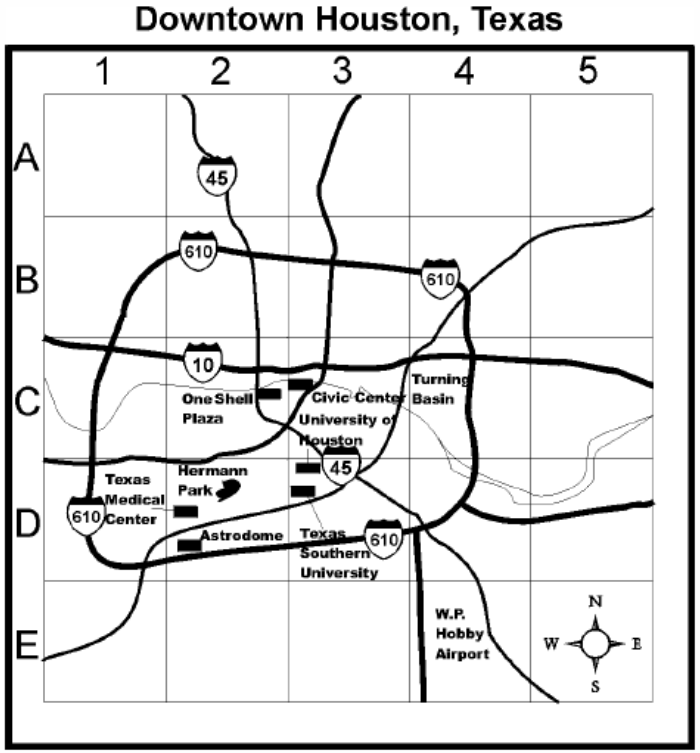
★

A. (4, 6)
B. (3, 2)
C. (6, 4)
D. (2, 3)

Coordinates

•Find the universities. Look up. What is the column number? 3 Look to the Left. What is the row letter? D

4.



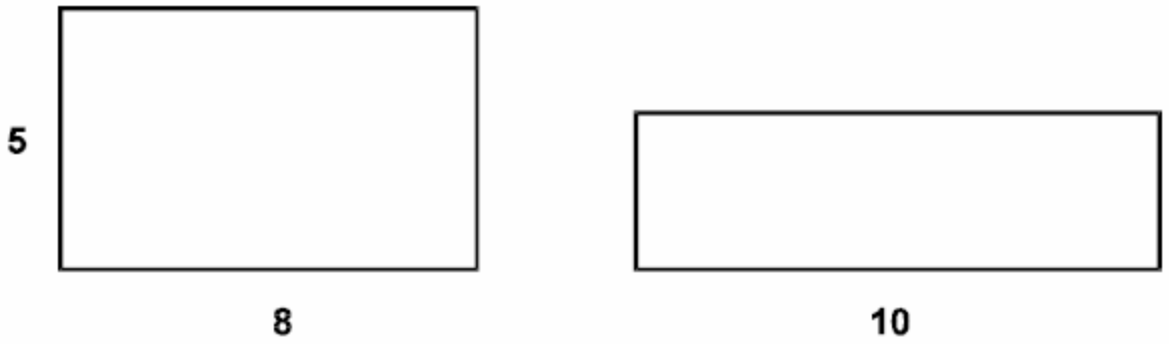
Which of the following indicates the square where Houston's two universities are located?

A. 2, D
B. 3, C
★ C. 3, D
D. 3, 2

Perimeter

- Perimeter is like a fence – it goes all the way around
- Rectangles have 2 sets of equal sides.
- Draw in the numbers that are missing, and then add up all the sides
- 1st rectangle 5+8+5+8 = 26 If both perimeters are the same, then the 2nd perimeter is 10+10+?+? = 26. 10 + 10 is 20, so the missing sides must add up to 6. They must be 3 each.

The perimeters of the two rectangles are equal. What is the width of the second rectangle?



★ A. 3
B. 5
C. 8
D. 10

Perimeter

•A pentagon has 5 sides. They give you 4 sides and you must find the missing side. The total is 27. 3+4+5+6+?=27 18+?=27 ? = 9

An irregular pentagon has a perimeter of 27". Four of its sides are 3", 4", 5" and 6". What is the length of the remaining side?

	A.	3"
	B.	7"
★	C.	9"
	D.	18"

Volume of Cylinders

•The best way to know for sure which one is bigger is to work each problem out.

First one:

$V = \pi r^2 h$ $V=(3.14)(3)^2(5)$ Do the exponent first $(3)^2= 9$; Now

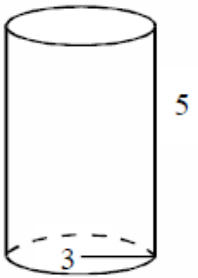
$V=(3.14)(9)(5)=141.3$

Second one:

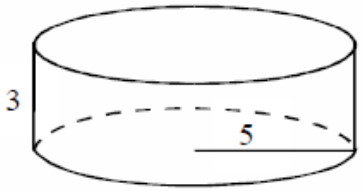
$V = \pi r^2 h$ $V=(3.14)(5)^2(3)$ Do the exponent first $(5)^2= 25$; Now

$V=(3.14)(25)(3)=235.5$

The volume of a cylinder is found by using the formula $V = \pi r^2 h$. How do the volumes of cylinder A and cylinder B compare?



cylinder A



cylinder B

A. The volume of cylinder A is larger.

★ B. The volume of cylinder B is larger.

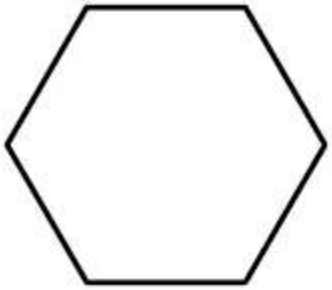
C. It is not possible to compare the volumes.

D. The volumes of cylinder A and cylinder B are the same.

Perimeter

- **First, read the question several times**
- **DRAW A PICTURE of the Square and make each side 12 inches. What is the perimeter of that square? 48 inches. A hexagon has 6 sides, and in a regular hexagon, all of the sides are the same. All you have to do is take the perimeter, divide by the number of sides.**
- 48/6 = 8

The regular hexagon below has the same perimeter as a square with a side of twelve inches. How long is each side of the hexagon?



A. 2 inches
B. 3 inches
C. 6 inches
★ D. 8 inches

Surface Area

- You can't be Lazy with surface area, because there are 6 areas that you need to add together.
- DRAW A CUBE that has a length, width, and height of 9.
- What is the area of each side (L x W)? 9 x 9 = 81.
- With a cube you have six areas that are all the same
- 81+81+81+81+81+81 = 486

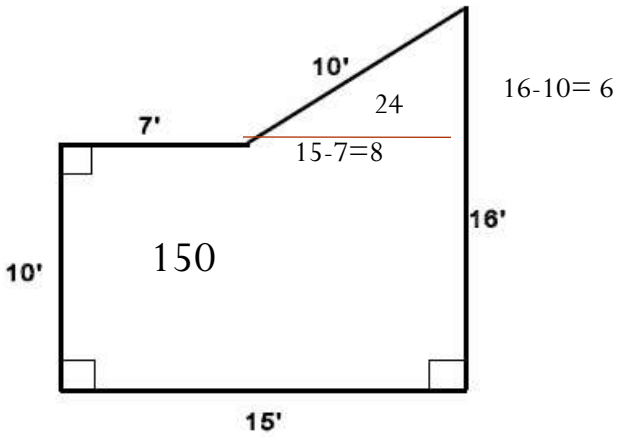
What is the surface area of a cube with an edge that measures 9 centimeters?

A. 81 square centimeters
B. 108 square centimeters
C. 324 square centimeters
★ D. 486 square centimeters

Irregular Area

- Draw in lines, and find smaller areas
- Add up all of the areas
- You may have to add and subtract to find some of the sides
- 150 + 24 = 174

6. Tim has an irregularly shaped garden, as shown below.



16-10= 6

What is the area of his garden (in square feet)?

A. 58 square feet
★ B. 174 square feet
C. 198 square feet
D. not enough information provided

Shapes
The EARTH is a SPHERE

A shoe box is **most** like a

A. cone.
B. cylinder.
★ C. rectangular solid.
D. sphere.

Which item is **most** like a cylinder?

A. basketball
B. box of cookies
★ C. can of soup
D. desk

The strings on a guitar are examples of what kind of line segments?

A. colinear
B. intersecting
★ C. parallel
D. perpendicular

Shapes

A telephone pole is **most** like a

A. cone.
★ B. cylinder.
C. rectangular solid.
D. sphere.

Sum of interior angles

Number of angles – 2 * 180

Triangle 3 angles 3-1=1 1*180 = 180 degrees in a triangle

Hexagon = 6 angles 6-2=4 4*180 = 720

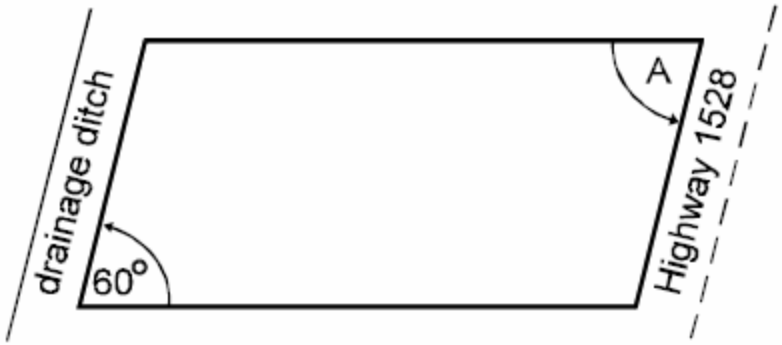
Sarah's flower garden is in the shape of a hexagon. What is the sum of the degree measures of the interior angles of her garden?

A. 120°
B. 180°
C. 360°
★ D. 720°

Parallelogram

- The opposite sides of the parallelogram are the same

Mr. Curtis's field, which is in the shape of a parallelogram, covers an area between Highway 1528 and a drainage ditch. What is the measure of ∠A?



A. 30°

★ B. 60°

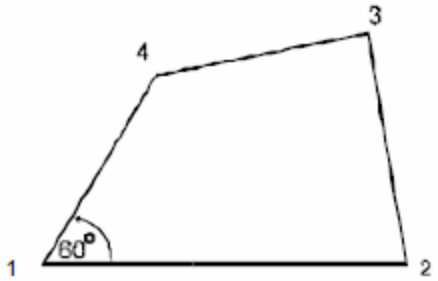
C. 120°

D. There is not enough information given to determine the measure of ∠A.

Quadriliaterial

- **We know that the sum of the interior angles = 4-2*180 2*180=360**
- **If angle 1 = 60, then 2+3+4 must equal 300. None of the choices matches the information that we have.**

In the figure shown here, no sides are parallel. Angle 1 has a measure of 60°. What must be true of the other 3 angles?



A. Angles 2, 3, and 4 must be right angles.
★ B. We cannot know the measure of the other angles.
C. Angle 4 = 120, but we can't tell about Angles 2 and 3.
D. The sum of Angle 2 + Angle 3 + Angle 4 must be 360°.

Triangles – Classified by SIDES
Equilateral – All sides the same length
Isosceles – 2 sides the same length
Scalene – no sides the same length

The Pep Club is making pennants, as shown below. The angles at the top and the bottom of the pennant are equal in measure. Classify the triangle according to the lengths of its sides.

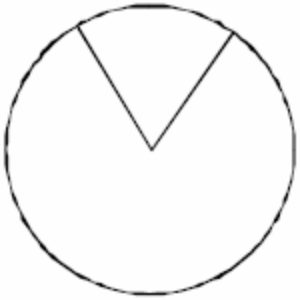
A. acute triangle
B. equilateral triangle
★ C. isosceles triangle
D. scalene triangle

Circle problems

- 2 things you need to know for this problem:
- What is the total number of degrees in a circle? 360
- What is the degrees in an acute angle? LESS than 90
- 360 divided by 90 = 4 BUT we need angles less than 90, so we would need one more piece.

Tyrone wants to make a design with a circle divided into pie-shaped pieces of equal size. What is the **smallest** number of pieces Tyrone can have if he wants the central angles to be acute?

	A.	3
	B.	4
★	C.	5
	D.	6



Complementary Angles

- **Complementary angles = 90**
- **"C" stands for "Corner" There is a corner on a right angle**
- **DRAW A PICTURE and try some values. If A is 50, then B is 40. If B is 40, than C is 50. That means that A and C are the same.**

If ∠A and ∠B are complements, and ∠B and ∠C are complements, what must be true of ∠A and ∠C?

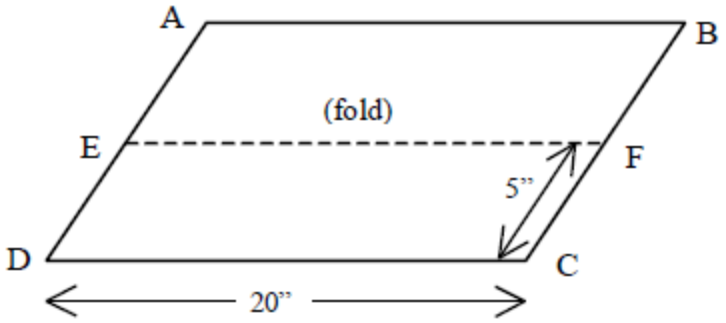
★ A. They have the same measure.
B. They are supplementary angles.
C. They are complementary angles.
D. They are interior angles of a polygon.

Parallelograms

- **READ the question very carefully. What is it asking? What is the measure of AE**
- **Find AE. It's halfway between A and D If CF is 5", then AE will also be 5".**

Judy has a piece of construction paper shaped like a parallelogram. She folds it in half as shown. What is the measure of line segment AE?

	A	2.5 inches
★	B.	5.0 inches
	C.	10.0 inches
	D.	20.0 inches

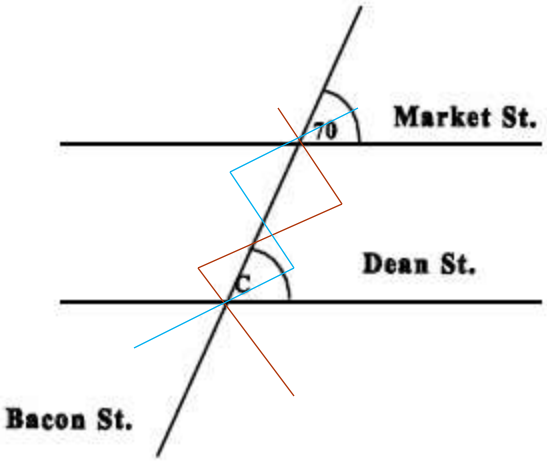


Parallel lines cut by a transversal

- Draw the zig-zags like I did with the red and blue
- All of the angles on the zig-zag are the same.
- Angle 70 and angle c are on the same blue zig-zag, so they are the same.
- The other angles are 180-70 = 110, so all of the red zig-zag angles are 110.

Market Street and Dean Street are parallel to each other. Bacon Street crosses Market Street and Dean Street. What is the measure of ∠C?

	A.	30°
	B.	60°
★	C.	70°
	D.	110°

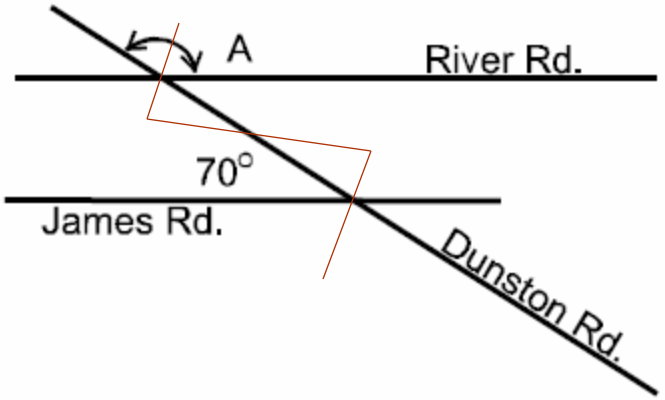


Parallel lines cut by a transversal

- You can draw the zig-zags, but you can tell that angle A is obtuse (greater than 90 degrees) and not the same as 70 degrees.
- IF ANGLES ARE NOT THE SAME, THEN THEY ARE SUPPLEMENTARY
- IT'S EITHER ONE OR THE OTHER.
- EITHER THEY ARE EQUAL, OR IT'S 180 – THE ANGLE
- SO, 180 – 70 = 110

James Road and River Road are parallel. What is the measure of ∠A?

A. 70°
B. 90°
C. 100°
★ D. 110°

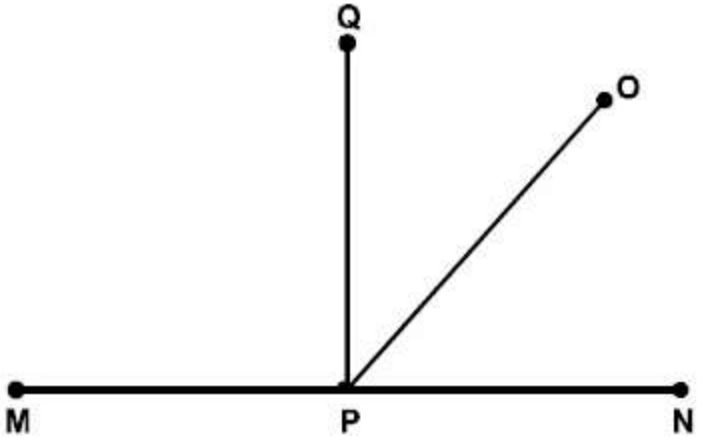


Straight Angles

- Look at angle MPN, and it forms a straight line
- Straight angles = 180 degrees

What is the measure of ∠MPN?

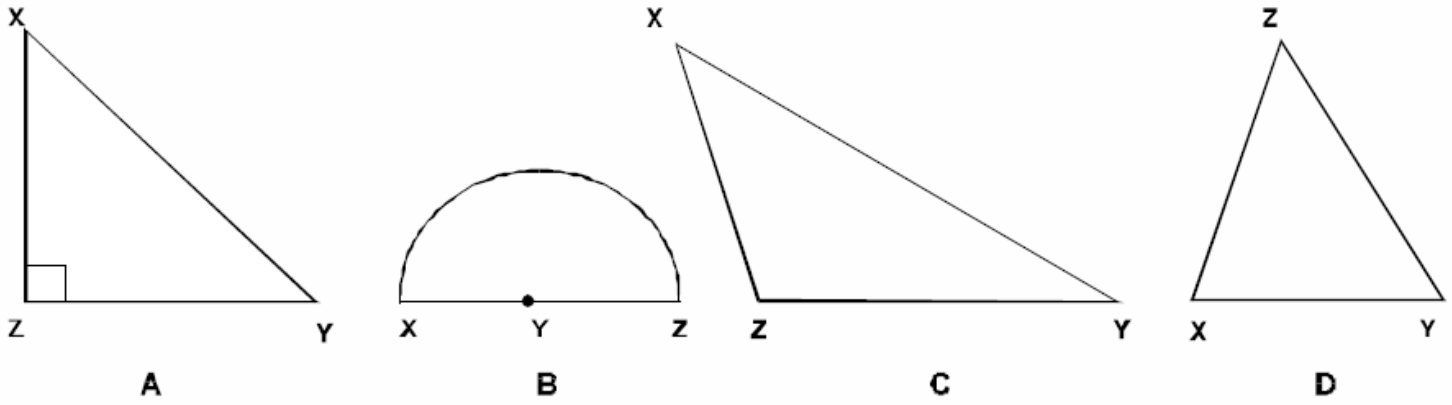
A. 60°
B. 90°
★ C. 180°
D. 360°



Pythagorean Theorem

Fact: You can only use the Pythagorean Theorem on RIGHT triangles
Look for the corner!

In which figure could the Pythagorean theorem be used to find the length of $\overline{XY}$?

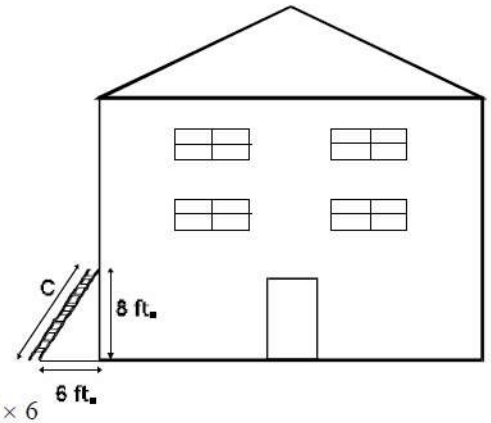


★ A. A
B. B
C. C
D. D

Pythagorean Theorem

- Remember $a^2 + b^2 = c^2$ where c is the slanted side (hypotenuse).
- Write out the formula, and then plug in the numbers you have.
- $a^2 + b^2 = c^2$
- $6^2 + 8^2 = c^2$
- $\sqrt{6^2 + 8^2} = C$

A ladder is placed against the side of a house, as shown. Which method should determine the length of the ladder (C)?



A. $C = 2 \times 8 + 2 \times 6$

★ B. $C = \sqrt{8^2 + 6^2}$

C. $C = 8 + 6$

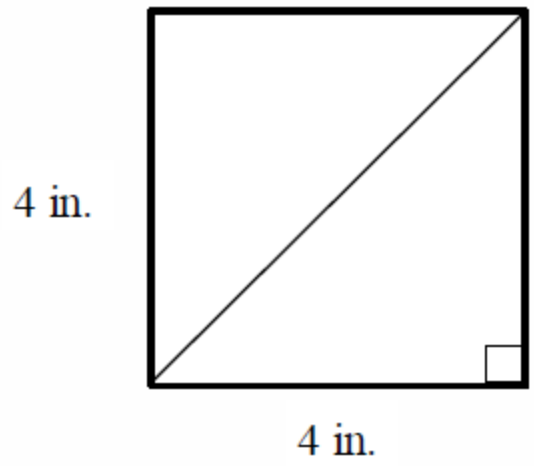
D. $C = \frac{(8 \times 6)}{2}$

Pythagorean Theorem

- Diagonal of a square
- $a^2 + b^2 = c^2$
- $4^2 + 4^2 = c^2$
- $16 + 16 = c^2$
- $32 = c^2$
- $C = \sqrt{32}$
- On calculator it equals 5.65 which rounds to 6.

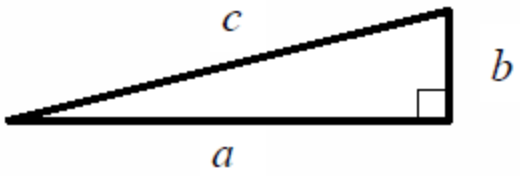
A square piece of paper, each side four inches long, is folded diagonally on the dotted line, as shown. To the nearest inch, how long is the crease made in the fold?

A. 4 inches
★ B. 6 inches
C. 8 inches
D. 16 inches



Pythagorean Theorem

- In this problem, you would solve for b.
- $a^2 + b^2 = c^2$
- Subtract a^2 from both sides.
- $b^2 = c^2 - a^2$



In the drawing above, the length of side a equals 36 inches. The length of side c is 36.5 inches. Which formula would determine the length of side b?

A. $a^2 + b^2 = c^2$
★ B. $c^2 - a^2 = b^2$
C. $a^2 - b^2 = c^2$
D. $a^2 + c^2 = b^2$

Word Problems

- **Read the problem very carefully. By looking at the answers, you can tell that you are supposed to use the distributive property.**
- **Write down everything you need to add and multiply**
- **6(10) + 4(13) +5(10) + 6(13) + 30**
- **You have 2 things multiplied by 10, and 2 things multiplied by 13. Using the distributive property, you can write 10(6+5) +13(4+6) + 30**

John bought 6 apples for 10 cents each and 4 pears for 13 cents each at one store. At a second store, he bought 5 apples for 10 cents each, 6 pears for 13 cents each, and a grapefruit for 30 cents. Which expression would enable John to find out how much money he spent in the two stores?

A. $22(10 + 13) + 30$
B. $6(10) + 6(13) + 30$
C. $10(26) + 11(26) + 30$
★ D. $10(5 + 6)+13(4 + 6) +30$

Simplifying expressions

•When you have two terms in the numerator (3x and 4y), each one of those terms are over 3x, so you can't cancel the 3x.

Linda's math homework required her to simplify, if possible, algebraic expressions. She simplified an expression this way:

$$\frac{3x + 4y}{3x} = 4y$$

Which statement explains what Linda did?

A. She simplified the expression correctly.
★ B. She canceled incorrectly, and the answer is incorrect.
C. She should have canceled only the 3s, and the answer is incorrect.
D. She did not add the terms in the numerator, and the answer is incorrect.

Simplifying expressions

- If there is nothing between a number and the parenthesis, then you multiply.
- $3(2n) = 6n$
- $6n + n = 7n$

Simplify, if possible.

$3\ (2n) + n$

A. $3n$
B. $6n$
★ C. $7n$
D. $9n$

Word Problems

- **$8 goes with the regular hours and $12 goes with overtime hours.**
- **She worked 40 regular hours and 5 overtime hours**
- **8(40) + 12(5)**

Lucy uses the expression 8x + 12y to determine the amount she earns each week at a pay rate of eight dollars an hour, plus time and a half for overtime. One week she worked 40 hours plus 5 hours overtime. Which expression **best** represents her total pay for the week?

★ A. 8 (40) + 12 (5)

B. 8 (5) +12 (40)

C. 20 (45)

D. $\frac{20}{12} + \frac{12}{5}$

Word Problems

- Read the problem several times
- What does x represent? Yellow marbles
- How many Yellow marbles does he have? 9
- Plug in 9 for x: $2(9) + 5 = 23$

The number of red marbles that Jon has is shown by the expression $2x + 5$, with x representing his yellow marbles. If Jon has 9 yellow marbles, how many red marbles does he have?

A. 7
B. 17
★ C. 23
D. 47

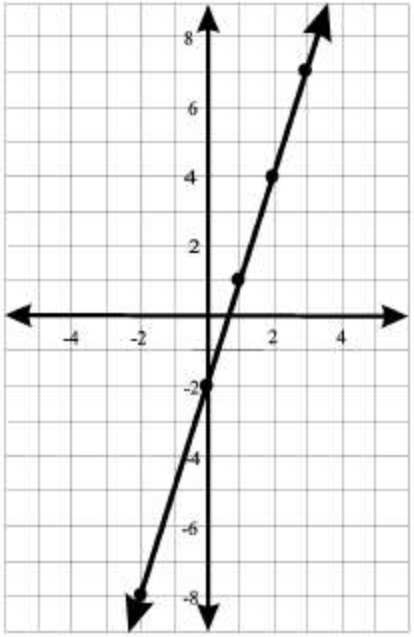
Evaluating Expressions

- Carefully plug in the number
- Remember the order of operations: PEMDAS: Please excuse my dear Aunt Sally
- Write PEMDAS on your paper
- Parenthesis first, then exponents.
- Multiplication and division at the same time left to right.
- Addition and subtraction at the same time left to right.
- $2(6)^2 + 6$
- Do $(6)^2$ FIRST!! This is SOOOOOOOO important!
- $(6)^2 = 36$
- $2(36) + 6 = 78$

Find the numerical value of $2b^2 + b$ when $b = 6$.

	A.	30
★	B.	78
	C.	150
	D.	228

Remember y = mx + b
m is the slope, and b is the y-intercept.



1. The graph shown at left is the graph of which of the following equations?

   A. $y = 2x - 3$

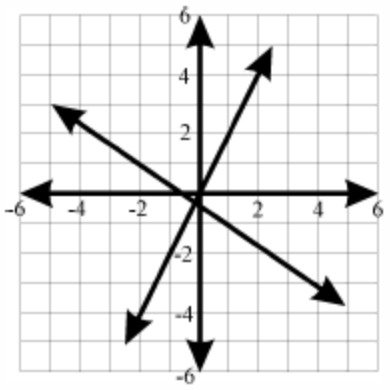
   B. $y = 3x + 2$

   ★ C. $y = 3x - 2$

   D. $y = 3(x - 2)$

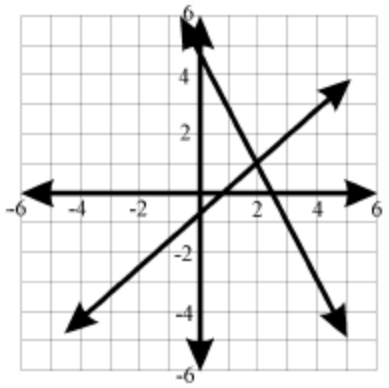
The solution to the system of the linear equations $x - y - 1 = 0$ and $2x + y - 5 = 0$ is the ordered pair (2, 1). Which graph represents the correct plot of the graph of these equations?

A.

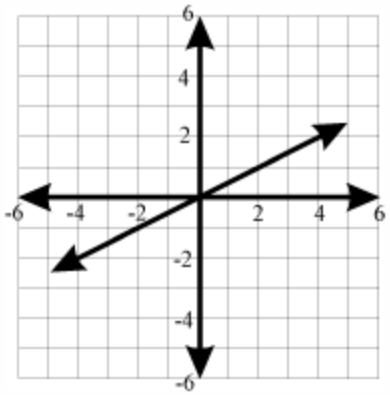


★

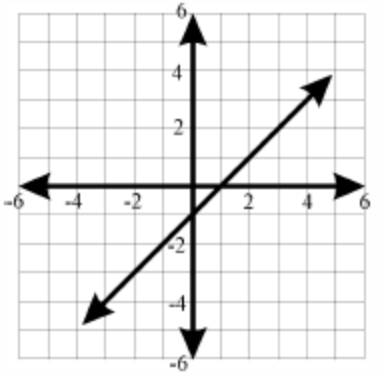
B.



C.

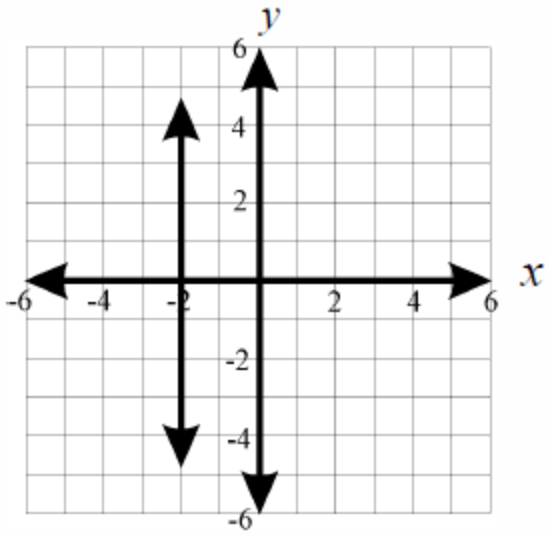


D.

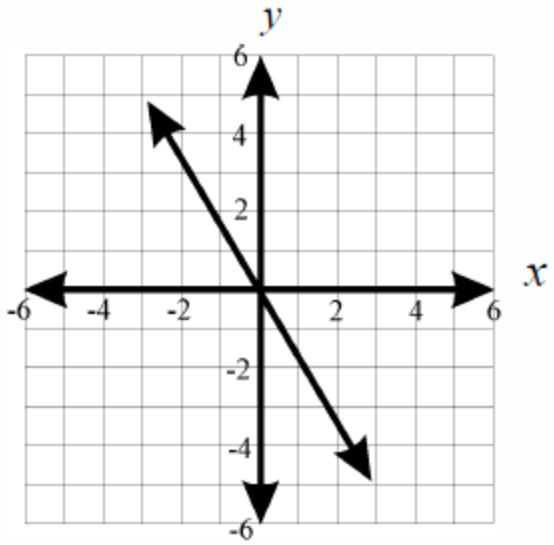


Which of the following graphs describes a linear equation where the x-intercept = -2 and the y-intercept = 3?

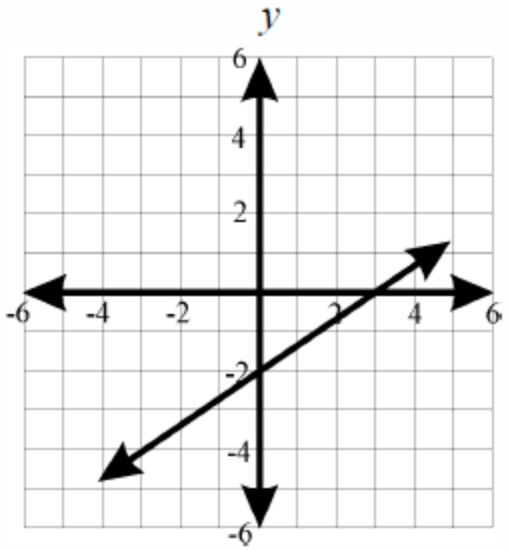
A.



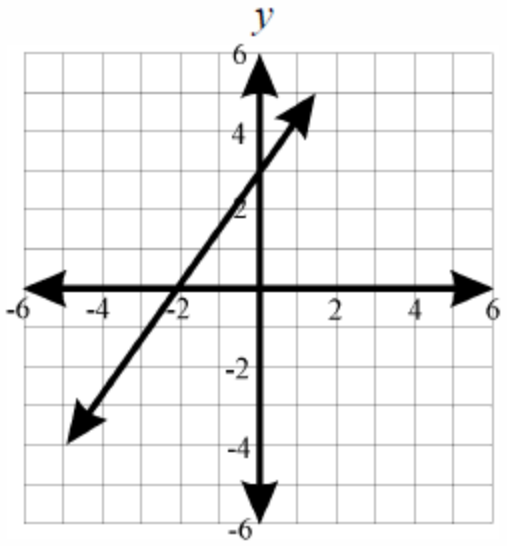
B.



C.



★ D.



The question tells you to use the formula d = rt. Distance = Rate * Time
The rate is 55 mph and the time is 6, so d=55 * 6.

Mary drives from Atlanta to Myrtle Beach in six hours. If she knows her average speed is 55 mph and wants to find the distance in miles from Atlanta to Myrtle Beach, what equation should she use? (Use the formula $d = rt$.)

★ A. $d = 55 \times 6$

B. $55 = 6d$

C. $d = \frac{55}{6}$

D. $6 = 55d$

Just put 5^2 in the calculator, and you will have 25.

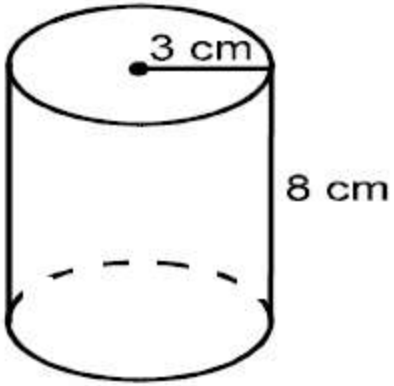
The hall in Ms. Jackson's house is a square, 5 feet on each side. To calculate the amount of carpet needed to cover the floor, she had to find the area of the floor. She used the formula $A = 5^2$, where 5 represents the length of one side. How many square feet of carpet did she need to carpet the hall?

A. 5 sq. ft.
B. 10 sq. ft.
C. 20 sq. ft.
★ D. 25 sq. ft.

In the calculator, type the pi button, then $3^2 8$

Determine the volume of the cylinder shown to the nearest hundredth. Use 3.14 for π.

$\mathbf{V} = \pi r^2 h$



A. 75.36 cm^3
★ B. 226.08 cm^3
C. 336.67 cm^3
D. 602.88 cm^3

Gallons over miles = gallons over miles.

Ramon's new car uses 5 gallons of gasoline to drive 147 miles. Which proportion should Ramon use to determine the number of gallons of gasoline (G) he will need to drive 300 miles?

★ A. $\frac{5}{147} = \frac{G}{300}$

B. $\frac{G}{147} = \frac{5}{300}$

C. $\frac{5}{G} = \frac{300}{147}$

D. $\frac{5}{147} = \frac{300}{G}$

Earth weight over moon weight = earth weight over moon weight. Set up the proportion as 108 over 18 = 120 over x. Cross multiply and solve for x.

A cylinder of test materials weighs 108 pounds on earth and 18 pounds on the moon. How much would an astronaut weigh on the moon if she weighs 120 pounds on earth?

★ A. 20 lbs.
B. 36 lbs.
C. 60 lbs.
D. 97 lbs.

First think about the question, and see if you can eliminate answers. 12 printing presses can do more work than 10. So 10 printing presses will take longer than 12. You can eliminate choices A and B right away, because they don't make sense. 12 over 3 = 10 over x. Solve for x.

Twelve printing presses, all alike, can do a job in 3 hours. How many hours would it take 10 of these printing presses to do the same job?

A. 2.5 hours
B. 3.0 hours
★ C. 3.6 hours
D. 4.0 hours

Which of the following algebraic expressions corresponds to "five reduced by the product of a number and six"?

A. $\frac{5}{6n}$

B. $6n - 5$

C. $5 + 6n$

★ D. $5 - 6n$

One-third of z is the same as z over 3.

Which of the following algebraic expressions corresponds to "the sum of x and y, multiplied by one-third of z"?

A. $\frac{xyz}{3}$

★ B. $\frac{z}{3}(x + y)$

C. $3z(x + y)$

D. $\frac{z}{3}(x - y)$

Which of the following algebraic expressions corresponds to "x increased by 2 is equal to one-third of y?"

A. $x - 2 = \frac{y}{3}$

★ B. $x + 2 = \frac{y}{3}$

C. $x + 2 = 3y$

D. $2x = \frac{y}{3}$

To undo the 6 TIMES x, you must Divide both sides by 6

Which operation would be used to solve the equation, $6x = 42$?

A. addition
★ B. division
C. multiplication
D. subtraction

You can first subtract 3 from both sides, and then divide by 2 OR you can plug in each of the answer choices into the calculator $2(5) + 3$

What is the value of x, if $2x + 3 = 15$?

	A.	5
★	B.	6
	C.	9
	D.	12

You can cross multiply and solve for x, or you can plug in each of the numbers until both sides of the equation are equal.

Solve for x, if $\frac{2}{x} = \frac{15}{60}$

	A.	4
★	B.	8
	C.	20
	D.	30

To find the total number of games, you must add the number of games he played with the number of games he didn't play. The total number of games is 11.

Sam is on the football team. He played in 7 games and did not play in 4. What is the ratio of the number of games he played to the total number of games?

A. $\frac{7}{4}$

B. $\frac{4}{7}$

C. $\frac{4}{11}$

★ D. $\frac{7}{11}$

Divide 45,000 by 5. You could eliminate C and D right away because they don't make sense.

If one out of 5 people drink Diet Delite, how many people can be expected to drink Diet Delite in a city of 45,000 people?

	A.	900
★	B.	9,000
	C.	44,995
	D.	225,000

You express the ratio in the order that it is mentioned in the question. The question was red to total, so it would be r over g + r.

In an art classroom there are r jars of red paint and g jars of green paint. Which fraction expresses the ratio of jars of red paint to the total number of jars?

A. $\frac{1}{8}$

B. $\frac{r}{g}$

C. $\frac{1}{g+r}$

★ D. $\frac{r}{g+r}$

We are looking for the line to cover every number above zero. That includes 0,1,2, and so on. You can eliminate A and B right away. C and D are almost exactly alike, except dot is shaded and the other one isn't. Look at the question again. We are looking for temperatures ABOVE 0, but that doesn't include the number 0 itself, so we need an OPEN endpoint.

Consider the statement: Ice will melt at all temperatures above 0° Celsius. Which of the graphs below correctly describes this statement?

A.

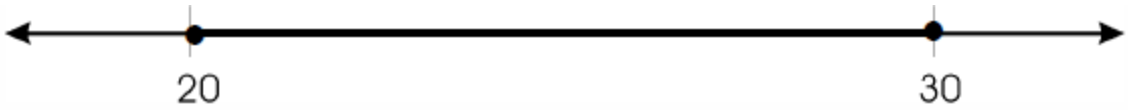
B.

★ C.

D.

The endpoints are CLOSED (shaded in), so we can eliminate A and B right away. C has the proper form for inequalities, but just remember that less than looks like an "L".

2.



Which inequality describes the interval graphed on the number line above?

A. $20 < g < 30$
B. $20 > g > 30$
★ C. $20 \leq g \leq 30$
D. $20 \geq g \geq 30$

A horizontal line has a slope of 0.

Which of the following describes the slope of a line parallel to the x axis?

A. positive slope
B. negative slope
★ C. zero slope
D. undefined slope

Given the inequality $7y < 35$, solve for y.

A. $y = 5$
★ B. $y < 5$
C. $y > 5$
D. $y \leq 5$

To find the slope, put the difference in the y's over the difference in the x's. Make sure to keep them in the same order.

Which is the slope of a line that passes through the points (7, -1) and (3, 3)?

A. $-\frac{1}{2}$ ★ B. -1 C. 1 D. 2

One testing tip, plug in 1 for x and 3 for y in both equations, if they both work, you have your answer!

Consider the system of the following two linear equations:

$$x + y = 4$$
$$3x - y = 0$$

Solve for x and y.

A. (1, -3)
★ B. (1, 3)
C. (-1, -3)
D. (-1, 3)