Directions: Answer the following question(s).

1 **Which number is irrational?**

A. 0.656656665. . .

B. $0.\overline{78}$

C. 2.35

D. $\frac{22}{7}$

Master ID: 143196 Revision: 1
Correct: A
Rationale:
A. **Correct**
B. Repeating decimal
C. Terminating decimal
D. Repeating decimal
Standards:
MGSE8.NS.1

2 **Which number is rational?**

A. $-\sqrt{5}$

B. π

C. $\sqrt{10}$

D. 0.4

Master ID: 143732 Revision: 1
Correct: D
Rationale:
A. Not a perfect square; non-repeating, non-terminating decimal
B. 3.14159 . . ., non-repeating, non-terminating decimal
C. Not a perfect square; non-repeating, non-terminating decimal
D. **Correct**
Standards:
MGSE8.NS.1

Directions: Answer the following question(s).

3 Which of the following represents $0.636363...$ as a fraction?

A. $\frac{7}{11}$

B. $\frac{77}{111}$

C. $\frac{7}{9}$

D. $\frac{77}{99}$

Master ID: 1999595 Revision: 1
Correct: A
Standards:
MGSE8.NS.1

4 **TEACHER READS:**

Read the question to yourself and select the best answer.

Greg and Patricia learned the following rule in math class.

A rational number can be written as a decimal with one or more digits after the decimal point that eventually repeat.

Greg believes that 6 is a rational number, while Patricia believes that it is not. Who is right, and why?

A. Greg is right, because 6 can be written as a decimal with repeating zeros after the decimal point.

B. Greg is right, because 6 is an exception to the given rule.

C. Patricia is right, because 6 cannot be written as a decimal.

D. Patricia is right, because the repeating digit(s) after the decimal point cannot be 0.

Master ID: 413596 Revision: 1
Correct: A
Rationale:
A. Correct answer
B. Student(s) may have correctly determined that Greg is right, but they may have misidentified the reason why.
C. Student(s) may not have recognized that 6 can be written as 6.0, 6.00, 6.000, etc., with any number of zeros after the decimal point.
D. Student(s) may have incorrectly concluded that the repeating digits after the decimal point must be from 1 to 9.
Standards:
MGSE8.NS.1

Directions: Answer the following question(s).

5 Which is the **best** estimate of the square root of 10?

A. a little less than 2
B. a little more than 2
C. a little less than 3
D. a little more than 3

Master ID: 1999355 Revision: 1
Correct: D
Standards:
MGSE8.NS.2

6 **When looking out over a large body of water, an observer can calculate the distance to the horizon by using the formula,** $d = \sqrt{1.5h}$, **where *d* is the distance to the horizon (in miles), and *h* is the height above sea level of the observer's eye (in feet). The height of the observer's eye is 9 feet above sea level. Between which two values is the distance to the horizon?**

A. between 0 and 1 miles
B. between 3 and 4 miles
C. between 6 and 7 miles
D. between 13 and 14 miles

Master ID: 147118 Revision: 1
Correct: B
Rationale:
A. Divided 1.5 by 9
B. **Correct**
C. Divided 13.5 by 2 instead of extracting the square root
D. Did not extract the square root
Standards:
MGSE8.NS.2

7 What is the approximate value of $\sqrt{58}$, to the nearest whole number?

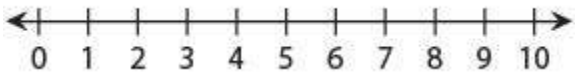
Input #1 Answers

- 8

Master ID: 2505883 Revision: 1
Correct:
Standards:
MGSE8.NS.2

Directions: Answer the following question(s).

8 Which value, when placed on the number line below, is closest to 10?



A. $3\sqrt{8}$
B. $\pi+6$
C. $\sqrt{83}$
D. π^2

Master ID: 2258733 Revision: 3
Correct: D
Rationale:
A. This results from a lack of understanding that the square root of 8 must fall between 2 and 3, and most likely closer to 3 (square root of 4 is 2 and square root of 9 is 3) and multiplying the answer of ≈3.0 x 3 to get ≈ 9, but the answer must be less than 9. Selection of this response represents a misunderstanding of square roots or values in front of square roots.
B. Pi has an approximate value of 3.14. Adding 6 to this gives 9.14, which is between 9 and 10, but closest to 9, making it the second largest value. Selection of this response represents a misunderstanding of the value of pi.
C. The square root of 83 has a value slightly larger than 9 (square root of 81 is 9). The selection of this response indicates a lack of understanding of approximating value of square roots.
D. Pi has an approximate value of 3.14 (it is slightly larger than this value). When multiplied by itself, it should yield an answer close to 10, making this the largest value of the numbers.
Rubric: 1 Point(s)
Standards:
MGSE8.NS.2

9 **A circular fence has a circumference of 42π feet. Which number is closest to the circumference of the fence?**

A. 126 feet
B. 132 feet
C. 134 feet
D. 143 feet

Master ID: 146516 Revision: 1
Correct: B
Rationale:
A. Multiplies 42 by 3 instead of 3.14
B. **Correct**
C. Multiplies 42 by 3.2 instead of 3.14
D. Multiplies 42 by 3.4 instead of 3.14
Standards:
MGSE8.NS.2

Directions: Answer the following question(s).

10 Which of the following expressions is equal to $8 \div 8^6 \times 8^8$?

A. 8^{-40}
B. 8^2
C. 8^3
D. 8^4

Master ID:	1999462 Revision:	1
Correct:	C	
Standards:		
MGSE8.EE.1		

11 Which of these expressions is equal to 2^5?

A. $2^6 \times 2$
B. $2^2 \times 4$
C. $4^2 \times 2$
D. $4^3 \times 2$

Master ID:	1999414 Revision:	1
Correct:	C	
Standards:		
MGSE8.EE.1		

12 Simplify the expression.

$6^3 \cdot 6^7$

A. 6^{21}
B. 6^4
C. 6^{10}
D. 36^{21}

Master ID:	2774374 Revision:	1
Correct:	C	
Standards:		
MGSE8.EE.1		

Directions: Answer the following question(s).

13 What is the value of $\frac{100}{10^4}$?

Input #1 Answers

- 0.01
- $\frac{1}{100}$

Master ID: 2511611 Revision: 1
Correct:
Standards:
MGSE8.EE.1

14 **TEACHER READS:**

Read the question to yourself and select the best answer.

$5^3 \cdot 5^4 =$ _____

A. 5^{12}
B. $8 \cdot 9$
C. 5^7
D. 25^{12}

Master ID: 372778 Revision: 1
Correct: C
Rationale:
A. Student(s) may have multiplied the exponents instead of adding.
B. Student(s) may have added the exponent to the numbers.
C. Correct answer
D. Student(s) may have multiplied the numbers and the exponents and did not apply the exponents rule correctly.
Standards:
MGSE8.EE.1

Directions: Answer the following question(s).

15 What is the perimeter of a square with an area of 121 square feet?

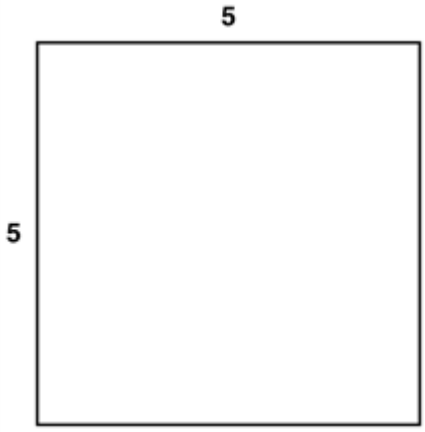
A. 11 feet
B. 44 feet
C. 121 feet
D. 484 feet

Master ID: 2505711 Revision: 1
Correct: B
Standards:
MGSE8.EE.2

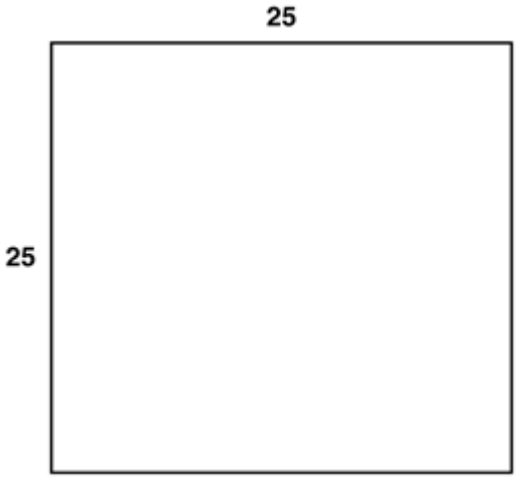
Directions: Answer the following question(s).

16 **Which model BEST represents $\sqrt{625}$?**

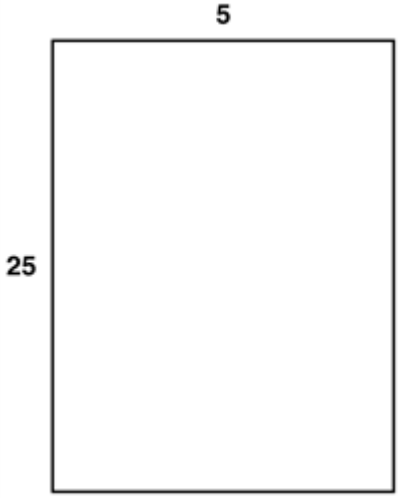
A.



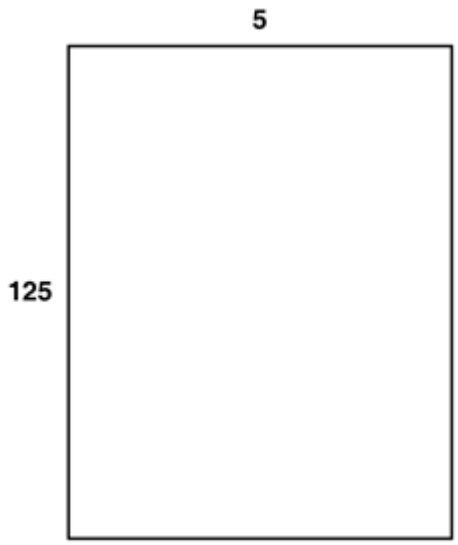
B.



C.



D.



Master ID: 521788 Revision: 1
Correct: B
Rationale:
A. This is the square root of 25
B. **Correct**
C. This has an area of 125 instead of 625
D. This has an area of 625, but is not the square root of 625
Standards:
MGSE8.EE.2

Directions: Answer the following question(s).

17 Maggie says there are two solutions to the equation $n = \sqrt{100}$; Barry says there is only one. Who do you agree with and why? Give all the values of n that satisfy the equation.

Master ID: 2113693 Revision: 4
Rubric: 2 Point(s)

2 The response is correct and complete. A sample 2-point response is shown below. It includes both the correct answer and an explanation.

1 The response is partially correct.

Responses at this level may give the correct answer but fail to offer an explanation, or may give an explanation that shows understanding but has a mistake in the actual answer.

0 The response is incorrect or there is no response.

Standards:
MGSE8.EE.1
MGSE8.EE.2
MGSE8.EE.3
MGSE8.EE.4

18 Drew wants to cover a square bulletin board with construction paper. The bulletin board has an area of 576 square inches. What is the length of each side of the bulletin board?

A. 138 inches
B. 69 inches
C. 24 inches
D. 12 inches

Master ID: 2511540 Revision: 1
Correct: C
Standards:
MGSE8.EE.2

Directions: Answer the following question(s).

19 Evaluate $9\sqrt{9}$.

A. 27
B. $\sqrt{27}$
C. 81
D. 243

Master ID: 307178 Revision: 3
Correct: A
Rationale:
A. This is the result of correctly evaluating the radical as 3 and multiplying it by 9.
B. This is the result of finding the square root of the number outside the radical and then multiplying it by the number inside the radical.
C. This is the result of ignoring the radical and simply performing the multiplication.
D. This is the result of squaring the number inside the radical instead of taking the square root of it and then multiplying that number by the number outside the radical.
Rubric: 1 Point(s)
Standards:
MGSE8.EE.1
MGSE8.EE.2
MGSE8.EE.3
MGSE8.EE.4

20 The average mass of a certain type of microorganism is 2.4×10^{-6} grams. What is the approximate total mass of 5,000 of these microorganisms?

A. 0.00012 g
B. 0.0012 g
C. 0.012 g
D. 0.12 g

Master ID: 324820 Revision: 4
Correct: C
Rationale:
A. This results from thinking that 12×10^{-3} is written with 3 zeros before the 12.
B. This results from placing the decimal point one place too far to the left.
C. The product of 2.4×10^{-6} and 5×10^{3} is $(2.4 \times 5) \times 10^{(-6 + 3)} = 12 \times 10^{-3} = 1.2 \times 10^{-2} = 0.012$.
D. This results from placing the decimal point one place too far to the right.
Rubric: 1 Point(s)
Standards:
MGSE8.EE.1
MGSE8.EE.3
MGSE8.EE.4

Directions: Answer the following question(s).

21 Scientists use a unit of measure known as an astronomical unit, or AU, to describe distances within the solar system. The AU is defined to be 149,597,870.700 kilometers, which is the mean distance from Earth to the Sun. The mean distance from the planet Jupiter to the Sun is 5.2 AU. What is this distance in kilometers, expressed in scientific notation?

A. 2.9×10^7 kilometers

B. 7.8×10^7 kilometers

C. 6.7×10^8 kilometers

D. 7.8×10^8 kilometers

Master ID: 2265478 Revision: 3

Correct: D

Rationale:

A. This is the result of dividing 1.49 x 10^8 by 5.2.

B. This is the result of multiplying 1.49 by 5.2 correctly, but using the incorrect exponent.

C. This results from correctly writing 1 AU as 1.49 x 10^8 and 5.2 AU as 5.2 x 10^0, but then adding 5.2 to 1.49 and adding the exponents.

D. This is the correct distance in kilometers. It is the result of converting the number of kilometers in one AU to scientific notation and then multiplying by 5.2.

Rubric: 1 Point(s)

Standards:

MGSE8.EE.1
MGSE8.EE.3
MGSE8.EE.4

Directions: Answer the following question(s).

22 In 2014 the country of China had a population of about 1.4 billion people.

A. Write the population of China using both expanded notation and scientific notation. Show your work.

In 2014 the country of India had a population of 1.25×10^9 people. Indonesia had a population of about 250 million people.

B. Explain how to determine how many more people lived in India than in Indonesia. Show all work to support your explanation, and write the difference using scientific notation.

C. List the populations of the three countries in order from least to greatest. Show your work in determining the order, and represent the populations using scientific notation.

Directions: Answer the following question(s).

Master ID: 2259203 Revision: 3
Rubric: 4 Point(s)

4 The response demonstrates a high level of understanding. A level 4 response is characterized by:

- Correct answers to part A, similar to "Expanded notation for one billion is 1,000,000,000. Therefore, 1.4 billion will be 1.4 × 1,000,000,000 = 1,400,000,000. Scientific notation represents this as the product of a number between 1 and 10 and the power of 10 that will give the result in the expanded notation. The power of 10 can also be found by counting the number of places the decimal point must move to the left to end at a number between 1 and 10. Using either method, the power of 10 will be 9. Therefore, the population of China can be represented as 1.4×10^9";
- A correct explanation for part B, such as "In order to calculate the difference between the two populations, either both can be rewritten in expanded form or both can be rewritten as a product using the same power of 10. The calculated difference can then be converted to scientific notation if necessary. The population of India is 1,250,000,000, and the population of Indonesia is 250,000,000. The difference between these two expanded forms is 1,000,000,000.0, which can be written in scientific notation as 1.0×10^9. The population of Indonesia, 250,000,000, can be written in scientific notation as 2.5×10^8 , and India's population is given as 1.25×10^9. In order to calculate a difference, the powers of 10 should be the same, so the population for India can be rewritten as 12.5×10^8. Setting up the subtraction gives $(12.5 \times 10^8) – (2.5 \times 10^8) = (12.5 – 2.5) \times 10^8 = 10.0 \times 10^8$ or 1.0×10^9, which is already in scientific notation." (Note: Accept one of the two strategies here or any other appropriate strategy for calculating the difference.);
- A correct answer for part B, namely 1.0×10^9 more people lived in India than in Indonesia in 2014;
- The correct order in part C with supporting work for the three countries' populations, similar to "The population of Indonesia is in the millions (or has an exponent of 8) and the populations of India and China are each in the billions (or have exponents of 9). Therefore, the population of Indonesia will be the smallest. The population of China at 1.4×10^9 is larger than the population of India at 1.25 billion (or 1.25×10^9) because they both have the same power of 10 but 1.4 is greater than 1.25. Therefore, the order of the three countries from least to greatest is: Indonesia (2.5×10^8), India (1.25×10^9), and China (1.4×10^9)."

3 The response demonstrates a strong understanding, but the work contains minor errors. A level 3 response is characterized by:

- Answers for part A that may contain a minor error;
- An explanation and supporting work for part B that may be incomplete or contain 1-2 minor errors;
- An answer for part B that is correct or consistent with minor error(s) in the explanation and/or supporting work;
- Supporting work for part C that may be incomplete or contain 1-2 minor errors that do not affect the correct final order. Order may be given as greatest to least.

2 The response demonstrates a basic but incomplete understanding. A level 2 response is characterized by:

- One correct answer for part A with the other answer incorrect or missing;
- An explanation, supporting work, and answer for part B that may contain multiple errors or omissions but are basically correct;
- Order and supporting work for part C that contain multiple errors or omissions but are basically correct.

1 The response demonstrates minimal understanding. A level 1 response is characterized by:

- Answers for part A that demonstrate little or no understanding but are not completely incorrect;
- An explanation, supporting work, and answer for part B that demonstrate little or no understanding but are not completely incorrect;
- Order and supporting work for part C that demonstrate little or no understanding.

0 There is no response, or the response is off topic.

Standards:
MGSE8.EE.1
MGSE8.EE.3
MGSE8.EE.4

Directions: Answer the following question(s).

23 Protozoans are microscopic single-celled life forms. One type of protozoan can grow to a diameter of 5×10^{-4} m.

A. Write this number in standard notation. Show your work.

A different type of protozoan can reach a length of 2×10^{-2} m.

B. How many times greater is this length than the diameter given in part A? Explain your reasoning, and show all work to support your explanation.

Freshwater protozoans are called paramecia. Some paramecia are 3.3×10^{-4} m in length, while others are 0.00005 m long.

C. List the lengths of the four protozoans given in part A, part B, and above in order from least to greatest using scientific notation. Show all work for determining the order.

Directions: Answer the following question(s).

Master ID: 2113667 Revision: 4
Rubric: 4 Point(s)

4 The response demonstrates a high level of understanding. A level 4 response is characterized by:

- A correct answer for part A, namely 0.0005 m;
- Correct supporting work for part A, similar to "Converting a number from scientific notation to standard form can be done by moving the decimal point according to the exponent of 10. In this case the exponent will move 4 places to the left since the exponent is negative. Although unwritten, the decimal point on 5 is located to its right. Therefore, moving the decimal point 4 places to the left will give 0.0005";
- A correct answer for part B, namely 40 times larger;
- A correct explanation for part B, similar to "The diameter in part A is given as 5×10^{-4} and the second protozoan's length is 2×10^{-2}. Since the powers of 10 are different, the length of the second protozoan can be converted to 200×10^{-4} so that both measures have the same power of 10. This allows the 200 and the 5 to be compared directly, which shows that the protozoan in part B is 40 times longer than the diameter of the protozoan in part A." (Note: Accept equivalent comparisons using standard form.);
- A correctly ordered list for part C, namely 5×10^{-5}, 3.3×10^{-4}, 5×10^{-4}, 2×10^{-2};
- Correct supporting work for part C, similar to "The only number not given in scientific notation is 0.00005. This can be converted by moving the decimal point to the right 5 places, so the result is a product of a number between 1 and 10 times a power of 10. The resulting form is 5×10^{-5}. Ordering numbers in scientific notation will have the smallest numbers represented by the largest negative exponents of 10. Where exponents are equal, the parts of the notation that are between 1 and 10 can be compared directly. Therefore, the smallest number will be 5×10^{-5}, the largest number is 2×10^{-2}, and the two remaining numbers can be ordered by comparing 3.3 and 5."

3 The response demonstrates a strong understanding, but the work contains minor errors. A level 3 response is characterized by:

- A correct answer for part A;
- Supporting work for part A that may be incomplete or contain 1–2 minor errors but still leads to the correct solution;
- A correct answer for part B;
- A correct explanation for part B that may be incomplete or contain 1–2 minor errors but still leads to the correct solution;
- An ordered list for part C that may be correct or consistent with a minor error in the supporting work;
- Supporting work for part C that may be incomplete or contain 1–2 minor errors.

2 The response demonstrates a basic but incomplete understanding. A level 2 response is characterized by:

- An answer and supporting work for part A that are basically correct but may contain multiple errors or omissions;
- An answer and explanation for part B that are basically correct but may contain multiple errors or omissions;
- An ordered list and supporting work for part C that are basically correct but may contain multiple errors or omissions or give the order from greatest to least.

1 The response demonstrates minimal understanding. A level 1 response is characterized by:

- An answer and/or supporting work for part A that may be partially missing or demonstrate little understanding but are not completely incorrect;
- An answer and/or explanation for part B that may be partially missing or demonstrate little understanding but are not completely incorrect;
- An answer and/or supporting work for part C that demonstrate little or no understanding but are not completely incorrect.

0 The response is completely incorrect, there is no response, or the response is off topic.

Standards:

MGSE8.EE.1
MGSE8.EE.3
MGSE8.EE.4

Directions: Answer the following question(s).

24 In 2010, the population of Brazil was about 1.987×10^8 people. The population of Lithuania was about 3.555×10^6 people. What was the total population of Brazil and Lithuania? Write your answer in scientific notation.

A. 5.542×10^8 people

B. 2.023×10^8 people

C. 1.951×10^8 people

D. 5.542×10^{14} people

Master ID: 2804439 Revision: 1
Correct: B
Standards:
MGSE8.EE.4

25 The fairy fly is one of the world's smallest insects. It may measure no more than 1.39×10^{-4} meter in length. What is the total length of 2 of these insects, placed end to end?

A. 2.78×10^{-4} meter

B. 2.78×10^{-8} meter

C. 1.39×10^{-8} meter

D. 1.39×10^{-2} meter

Master ID: 307203 Revision: 3
Correct: A
Rationale:
A. Since 1.39 + 1.39 = 2.78, which is less than 10, the exponent does not change. The result of adding $1.39 \times 10^{-4} + 1.39 \times 10^{-4}$ is 2.78×10^{-4}.
B. This is the result of multiplying both 1.39 and the exponent -4 by 2.
C. This is the result of multiplying the exponent -4 by 2.
D. This is the result of dividing the exponent -4 by 2.
Rubric: 1 Point(s)
Standards:
MGSE8.EE.1
MGSE8.EE.3
MGSE8.EE.4

Directions: Answer the following question(s).

26 **TEACHER READS:**

Read the question to yourself and select the best answer(s).

Which equations are correct? Select *three* that apply.

A. $(6.1 \times 10^5) + (2.3 \times 10^6) = 291{,}000$

B. $(3.3 \times 10^8) + (5.4 \times 10^7) = 87{,}000{,}000$

C. $(4.2 \times 10^7) + (3.7 \times 10^6) = 45{,}700{,}000$

D. $(2.4 \times 10^6) + (4.4 \times 10^5) = 6{,}800{,}000$

E. $(5.8 \times 10^7) + (2.1 \times 10^8) = 268{,}000{,}000$

F. $(4.3 \times 10^5) + (5.2 \times 10^4) = 482{,}000$

Master ID: 552959 Revision: 1
Correct: CEF
Rationale:
A. Student(s) may have correctly converted both numbers on the left side of the equation to decimal notation, but they may have been off by a factor of 10 when finding the sum of the numbers.
B. Student(s) may not have converted the numbers on the left side of the equation to decimal notation. Student(s) may have instead added 3.3 and 5.4 together and multiplying the result by 10 raised to the smaller of the two exponents in the equation.
C. Correct answer
D. Student(s) may not have converted the numbers on the left side of the equation to decimal notation.
E. Correct answer
F. Correct answer
Standards:
MGSE8.EE.4

27 **The average ant weighs about 1.0×10^{-5} kilogram. What is 1.0×10^{-5} written in standard notation?**

A. 0.0001

B. 0.00001

C. 0.000001

D. 0.0000001

Master ID: 144768 Revision: 1
Correct: B
Rationale:
A. Used 10 instead of 1.0 when converting to standard notation
B. **Correct**
C. Used 0.1 instead of 1.0 when converting to standard notation
D. Used 0.01 instead of 1.0 when converting to standard notation
Standards:
MGSE8.EE.4

Directions: Answer the following question(s).

28 Look at this equation.

$$5^2 \cdot 5^4 = 5^6$$

Explain why this equation is true using the properties of exponents. Do not simply state that this is a rule.

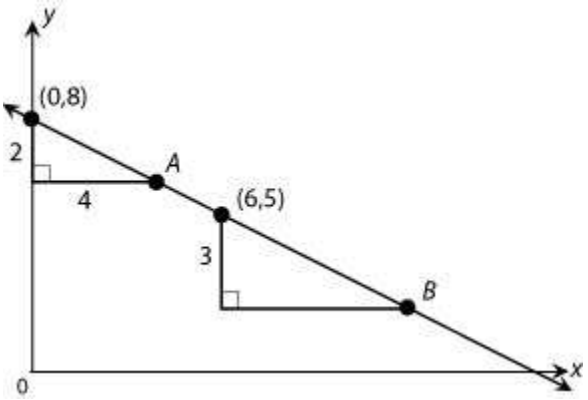
Master ID: 307161 Revision: 4
Rubric: 2 Point(s)

2	The response is correct and complete. A sample 2-point response is shown below.
1	The response is partially correct.
0	The response shows some understanding of the rules of exponents but may be incomplete or unclear.

Standards:
MGSE8.EE.1
MGSE8.EE.3
MGSE8.EE.4

Directions: Answer the following question(s).

29 The two right triangles in the figure below are similar because each hypotenuse lies along the same line.



What are the coordinates of point B?

A. (12, 2)
B. (3, 11)
C. (10, 1)
D. (4, 6)

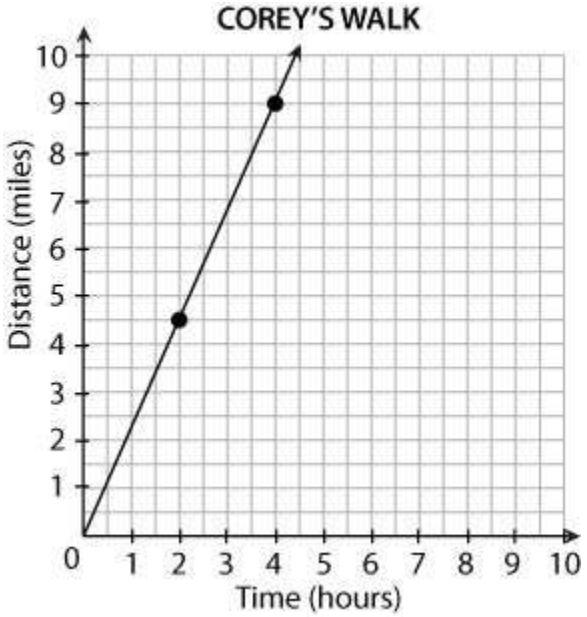
Master ID: 307239 Revision: 5
Correct: A
Rationale:

A. Since the triangles are similar, the sides must be in proportion. In the smaller triangle the run is twice the rise, so in the larger triangle the run must be 6, or twice the given rise of 3. This means the coordinate of B is (6 + 6,5 - 3) or (12,2).
B. This answer applies the vertical change (-3) to the x-coordinate of 6, and the horizontal change (6) to the y-coordinate of 5.
C. This answer uses the sum of the two horizontal triangle legs (4 + 6) and the sum of the difference of the two vertical triangle legs (3 - 2).
D. These are the coordinates of point A.

Rubric: 1 Point(s)
Standards:
MGSE8.EE.5
MGSE8.EE.6

Directions: Answer the following question(s).

30 The graph below shows the distance and time that it takes Corey to hike along a trail near his house.



Ray starts hiking the same trail at the same time and the same starting spot as Corey. Ray hikes at a constant pace, and after 1 hour he is 3 miles from the starting point.

A. If both boys continue hiking at a constant pace, how far apart are they after 4 hours? Show your work.

B. If Ray had decided to start his hike 2 hours after Corey started his hike, and he kept a constant pace of 3 miles every hour, what equation could be used to model Ray's hike? Show your work.

Directions: Answer the following question(s).

Master ID: 2113741 Revision: 3
Rubric: 4 Point(s)

4 The response demonstrates a high level of understanding. A level 4 response is characterized by:

- A correct answer in part A, namely that Corey and Ray are 3 miles apart;
- Correct work in part A, similar to "From the graph, I can see that after 4 hours, Corey has hiked 9 miles. To find how far Ray has hiked, I have to find his speed. Since after 1 hour, Ray hikes 3 miles, and he is hiking at a constant speed, his speed is 3 miles per hour. To find how far he hiked in 4 hours, I can use the proportion 3/1 = x/4. This gives me x = 12, so after 4 hours, Ray has hiked 12 miles. Therefore, Ray and Corey are 12 – 9 = 3 miles apart";
- A correct answer in part B, namely that the equation that models Ray's hike is $y = 3x - 6$;
- Correct work in part B, similar to "I know that if Ray waits 2 hours to start his hike, then at time = 2 hours, he is at a distance of 0, so (2, 0) is on the line. Also, since his rate is 3 miles per hour, at time = 3 hours, he is at a distance of 3 miles, so (3, 3) is on the line. I have to find the slope between these two points, so $m = (3 - 0)/(3 - 2) = 3$. Then I take this slope and one of the points to plug into the equation $y = mx + b$. So, 0 = (3)(2) + b, and $b = -6$. So the line for Ray is $y = 3x - 6$."

3 The response demonstrates a strong understanding, but the work contains minor errors. A level 3 response is characterized by:

- An answer for part A that contains a minor error;
- Work for part A that is incomplete or contains a minor error;
- An answer for part B that contains a minor error;
- Work for part B that is incomplete or contains a minor error.

2 The response demonstrates a basic but incomplete understanding. A level 2 response is characterized by:

- Work and answer for part A that are basically correct but may be incomplete and include two or more minor errors;
- Work and answer for part B that are basically correct but may be incomplete and include two or more minor errors.

1 The response demonstrates minimal understanding. A level 1 response is characterized by:

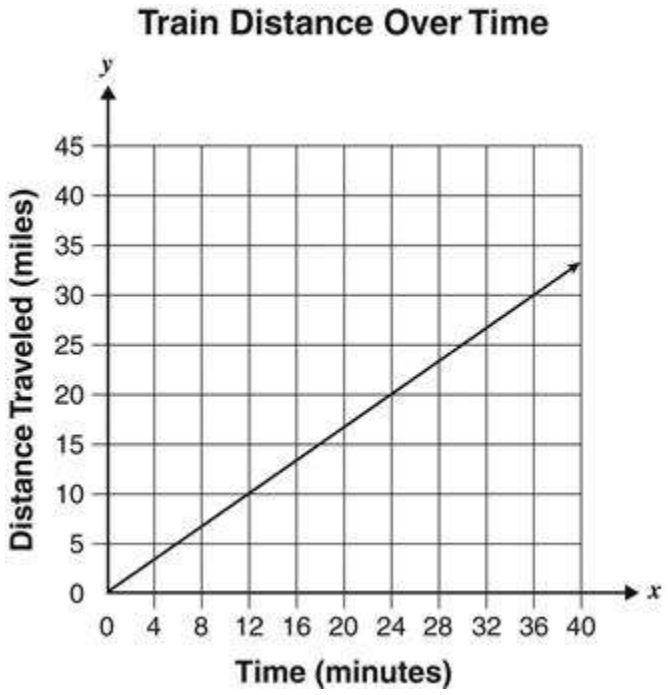
- Work and answer for part A that are incomplete or contain one or more major errors but are not completely incorrect;
- Work and answer for part B that are incomplete or contain one or more major errors but are not completely incorrect.

0 The response is completely incorrect, there is no response, or the response is off topic.

Standards:
MGSE8.EE.5
MGSE8.EE.6

Directions: Answer the following question(s).

31 **The graph below shows the distance a train traveled over time.**



According to the graph, at what speed did the train travel?

A. 18 miles per hour
B. 30 miles per hour
C. 50 miles per hour
D. 72 miles per hour

Master ID: 154224 Revision: 1
Correct: C
Rationale:
A. Since 36 minutes equals 0.6 hours, multiplies 30 by 0.6
B. Takes the train 1 hour to travel 30 miles instead of 0.6 hours (36 minutes)
C. **Correct**
D. Reads 30 on *y*-axis as 30 minutes for 36 miles
Standards:
MGSE8.EE.5

Directions: Answer the following question(s).

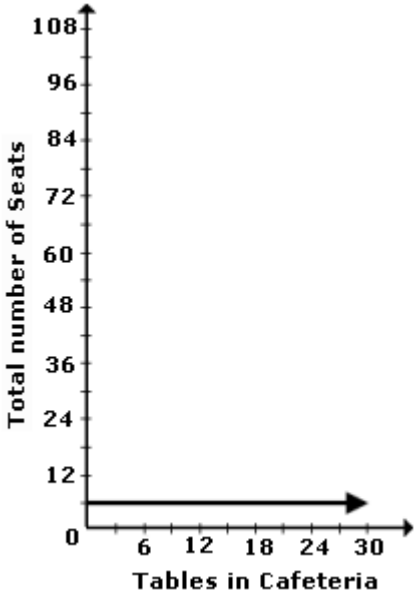
32 **TEACHER READS:**

Directions: Answer the following question(s).

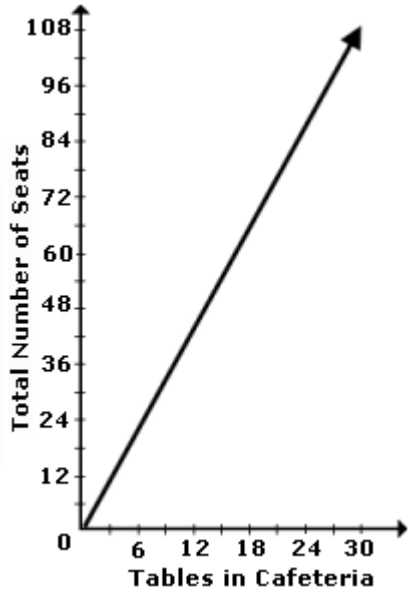
Read the question to yourself and select the best answer.

Each cafeteria lunch table is designed to seat 6 students. Which graph shows the relationship between the number of tables in a cafeteria and the overall seating capacity?

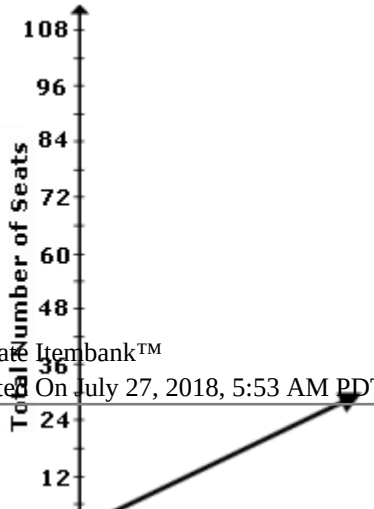
A.



B.



C.



Directions: Answer the following question(s).

Master ID: 407718 Revision: 1
Correct: D
Rationale:

A. Student(s) may have believed the graph must be horizontal because the number of seats at each table is constant.
B. Student(s) may have believed the graph must approach the ends of both axes.
C. Student(s) may have chosen the graph where the coordinates were equal, not realizing that the *y*–coordinate should be 6 times as the *x*–coordinate.
D. Correct answer

Standards:
MGSE8.EE.5

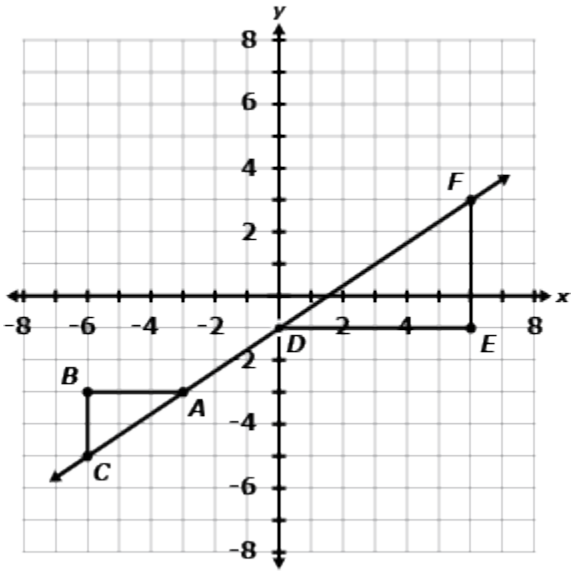
Directions: Answer the following question(s).

33

TEACHER READS:

Read the question to yourself and select the best answer.

Rhonda began deriving the equation of line *CF* below by defining the lengths of line segments *DE* and *EF* as *x* and *y* + 1, respectively. What proportion should she set up next using the similar triangles *ABC* and *DEF*?



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

B. $\frac{2}{3} = \frac{y+1}{x}$

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

D. $\frac{3}{2} = \frac{y+1}{x}$

Master ID: 414245 Revision: 1

Correct: B

Rationale:

A. Student(s) may have forgotten to add 1 to y in the numerator on the right side of the proportion.

B. Correct answer

C. Student(s) may have mixed up the positions of the 3 and the 2 in the proportion, and they may have forgotten to add 1 to *y* in the numerator on the right side of the proportion.

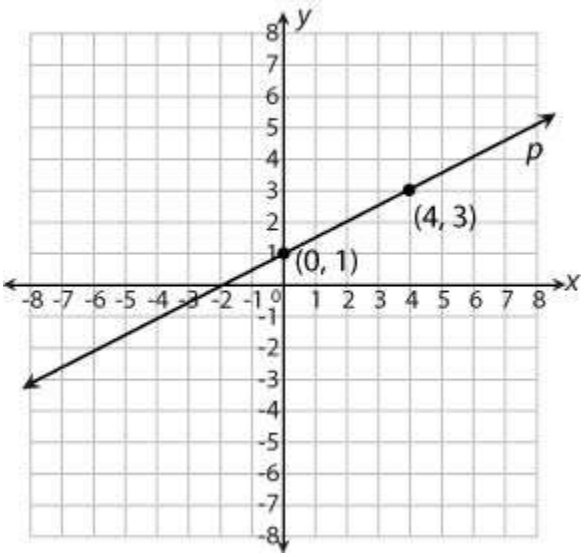
D. Student(s) may have mixed up the positions of the 3 and the 2 in the proportion.

Standards:

MGSE8.EE.6

Directions: Answer the following question(s).

34 The coordinate plane shows the graph of line p.



Which of the following can be used to help derive the equation of line p in the form $y = mx + b$?

A. $y - 3 = \left(\frac{3-1}{4-0}\right)(x-4)$

B. $y + 3 = \left(\frac{3+1}{4+0}\right)(x+4)$

C. $y + 3 = \left(\frac{4+0}{3+1}\right)(x+4)$

D. $y - 3 = \left(\frac{4-0}{3-1}\right)(x-4)$

Master ID: 307229 Revision: 5
Correct: A
Rationale:
A. This is correct, since it applies the point-slope formula to find the values of m and b.
B. This equation uses addition throughout instead of subtraction.
C. This equation uses addition throughout instead of subtraction, and it inverts the slope.
D. This equation inverts the slope.
Rubric: 1 Point(s)
Standards:
MGSE8.EE.5
MGSE8.EE.6

Directions: Answer the following question(s).

35 **Annie was given two pieces of information and must write the equation of a line. She knows the line crosses the *y*-axis at the point $(0, 5)$ and has a slope of – 4. What is the equation of the line?**

A. $y = 5x - 4$

B. $y = -5x + 4$

C. $y = 4x - 5$

D. $y = -4x + 5$

Master ID: 146291 Revision: 1
Correct: D
Rationale:
A. This equation has a slope of 5 and a *y*-intercept of negative 4
B. This equation has a slope of –5 and a *y*-intercept of 4
C. This equation has a slope of 4 and a *y*-intercept of negative 5
D. **Correct**
Standards:
MGSE8.EE.6

36 **TEACHER READS:**

Read the question to yourself and select the best answer.

Line segments *AB* and *CD* are both part of the same non–vertical line, and the slope of line segment *AB* is 6. Using similar triangles, what can you show the slope of line segment *CD* to be?

A. –6

B. $-\frac{1}{6}$

C. $\frac{1}{6}$

D. 6

Master ID: 415025 Revision: 1
Correct: D
Rationale:
A. Student(s) may have mistakenly assumed the slope of line segment *CD* must be the additive inverse of the slope of line segment *AB*.
B. Student(s) may have mistakenly assumed the slope of line segment *CD* must be the negative reciprocal of the slope of line segment *AB*.
C. Student(s) may have mistakenly assumed the slope of line segment *CD* must be the reciprocal of the slope of line segment *AB*.
D. Correct answer
Standards:
MGSE8.EE.6

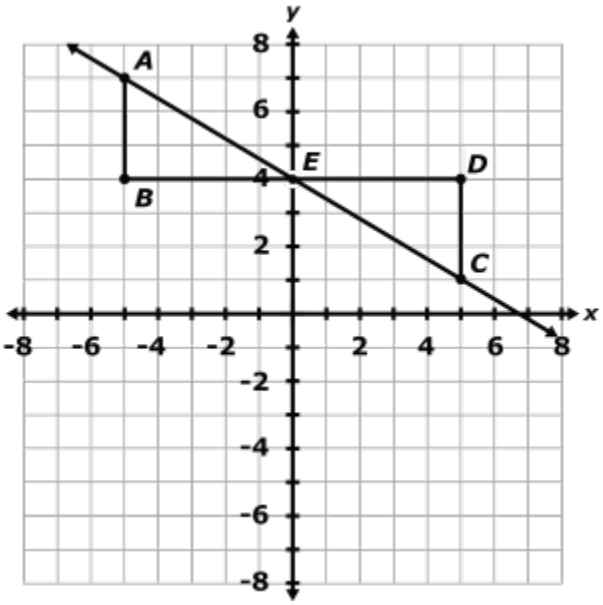
Directions: Answer the following question(s).

37

TEACHER READS:

Read the question to yourself and select the best answer.

Zach began deriving the equation of line *AC* below by defining the lengths of line segments *AB* and *BE* as *y* – 4 and –*x*, respectively. What proportion should he set up next using the similar triangles *ABE* and *CDE*?



A. $\frac{3}{5} = \frac{-x}{y-4}$

B. $\frac{3}{5} = \frac{x}{y+4}$

C. $\frac{3}{5} = \frac{y-4}{-x}$

D. $\frac{3}{5} = \frac{y+4}{x}$

Directions: Answer the following question(s).

Master ID: 414332 Revision: 1
Correct: C
Rationale:

A. Student(s) may have mixed up the numerator and the denominator on the right side of the proportion.
B. Student(s) may have mixed up the numerator and the denominator on the right side of the proportion, and they may have then tried to eliminate the negative sign in the numerator on the right side of the proportion by multiplying the right side by –1/–1, forgetting to place a negative sign before the *y*.
C. Correct answer
D. Student(s) may have tried to eliminate the negative sign in the denominator on the right side of the proportion by multiplying the right side by –1/–1, forgetting to place a negative sign before the *y*.

Standards:
MGSE8.EE.6

38 How many solutions does the equation below have?

$\frac{x}{3} + 8 = 4(x - 2) - \frac{11x}{3}$

Input #1 Answers

- 0

Master ID: 2511764 Revision: 1
Correct:
Standards:
MGSE8.EE.7a

39 The graph of $2x + y = 8$ is shown on the graph below. Graph the equation $y = \frac{1}{3}x - 6$ on the same coordinate plane below. Plot the point that represents the solution to the system consisting of the two equations.

To graph a line, make sure the "Line" button is highlighted. On the coordinate grid, find a point on the line and click on that point, then click on a second point to create the line. Once the line is graphed, click on the "Point" button to highlight it and add point(s) as instructed. Only graph the line and the solution point; any other lines or points will cause your answer to score as incorrect.

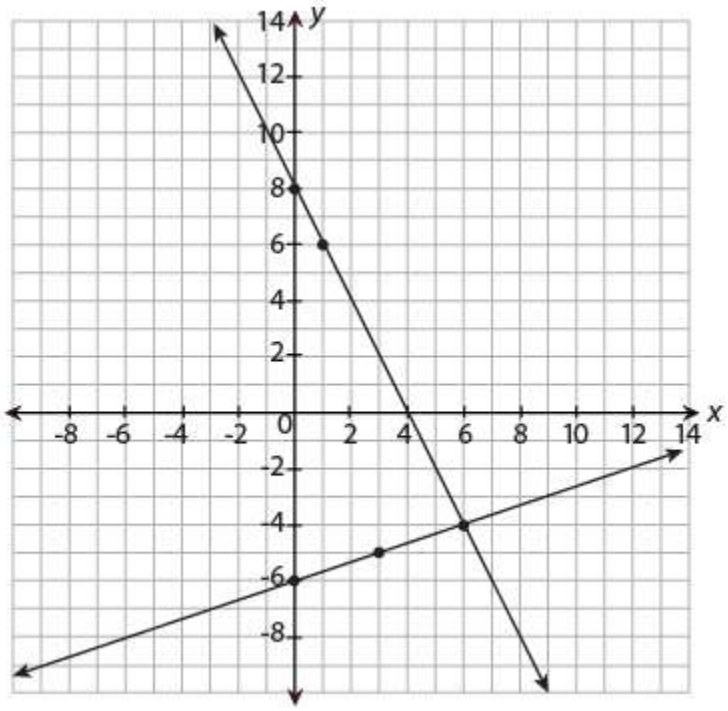
Web Only Interaction

Directions: Answer the following question(s).

Master ID: 2383015 Revision: 4
Rubric: 1 Point(s)

The first line is plotted as $2x + y = 8$ or $y = -2x + 8$. The new line can be plotted by starting at the point (0, –6), which is the y-intercept. From that point, the slope 1/3 can be used by moving up 1 and to the right 3 (landing at point (3, –5). The lines intersect at (6, –4).

The graph below shows the correct answer.



Standards:

MGSE8.EE.7a
MGSE8.EE.7b
MGSE8.EE.8a
MGSE8.EE.8b
MGSE8.EE.8c

Directions: Answer the following question(s).

40

TEACHER READS:

Read the question to yourself and select the best answer.

A linear equation with one variable, *x*, can be transformed into an equivalent equation that has one solution. Which of the following shows that the linear one–variable equation has one solution?

A. $x = x$

B. $x = 3$

C. $1 = 1$

D. $1 = 3$

Master ID: 552246 Revision: 1

Correct: B

Rationale:

A. Student(s) may have mistakenly chosen this answer since the question stem mentions the variable *x*, and this form has an *x* on both sides of the equation.

B. Correct answer

C. Student(s) may have mistakenly assumed that a linear equation that can be transformed into this form has one solution since both sides of the equation are equal to 1.

D. Student(s) may have mistakenly assumed that a linear equation that can be transformed into this form has one solution since the left side of the equation is equal to 1.

Standards:

MGSE8.EE.7a

Directions: Answer the following question(s).

41 Javier has $1,475 invested in stocks and bonds. The stocks pay 5% interest, and the bonds pay 10% interest. If his annual income from the stocks and bonds is $111.25, how much is invested in bonds?

A. $250
B. $725
C. $750
D. $1,225

Master ID: 948576 Revision: 3
Correct: C
Rationale:

A. This is the result of noting that a system of linear equations can be used to solve for the amount invested in stocks, s, and the amount invested in bonds, b. Therefore, the total amount invested is given by $s + b = 1{,}475$ and the total amount of interest earned is $0.05s + 0.1b = 111.25$. The system of equations is solved incorrectly by isolating s in the first equation to yield $s = 1{,}475 + b$ and substituting this value of s into the second equation to yield $0.05(1{,}475 + b) + 0.1b = 111.25$. This equation is simplified to give $73.75 + 0.05b + 0.1b = 111.25$ or $0.15b = 37.50$ or $b = 250$.

B. This is the result of incorrectly solving for the amount invested in stocks instead of the amount invested in bonds.

C. This is the result of noting that a system of linear equations can be used to solve for the amount invested in stocks, s, and the amount invested in bonds, b. Therefore, the total amount invested is given by $s + b = 1{,}475$ and the total amount of interest earned is $0.05s + 0.1b = 111.25$. The system of equations for b is solved correctly as follows: solving for s in the first equation yields $s = 1{,}475 - b$ and substituting this value of s into the second equation yields $0.05(1475 - b) + 0.1b = 111.25$. This equation is simplified to give $73.75 - 0.05b + 0.1b = 111.25$ or $0.05b = 37.50$ or $b = 750$. So, $750 is invested by Javier in bonds.

D. This is the result of noting that a system of linear equations can be used to solve for the amount invested in stocks, s, and the amount invested in bonds, b. Therefore, the total amount invested is given by $s + b = 1{,}475$ and the total amount of interest earned is $0.05s + 0.1b = 111.25$. The system of equations is solved incorrectly by isolating s in the first equation to yield $s = 1475 + b$ and substituting this value of s into the second equation to yield $0.05(1475 + b) + 0.1b = 111.25$. This equation is simplified to give $73.75 + 0.05b + 0.1b = 111.25$ or $0.15b = 37.50$ or $b = 250$. This value of b is then plugged into $s + b = 1{,}475$ to give $s = 1{,}225$. Therefore, this choice involves incorrectly solving for the amount invested in stocks instead of the amount invested in bonds.

Rubric: 1 Point(s)
Standards:
MGSE8.EE.7a
MGSE8.EE.7b
MGSE8.EE.8a
MGSE8.EE.8b
MGSE8.EE.8c

Directions: Answer the following question(s).

42 What value of x is the solution to the equation $\frac{-2x+2}{3} = -4$?

A. 3
B. 5
C. 7
D. 9

Master ID: 307282 Revision: 3
Correct: C
Rationale:
A. This is the result of incorrectly adding 2 to both sides of the equation, but then correctly multiplying both sides of the equation by 3 and dividing both sides of the equation by -2.
B. This is the result of multiplying both sides of the equation by 3, incorrectly adding 2 to both sides of the equation, but correctly dividing both sides of the equation by -2.
C. This is the result of multiplying both sides of the equation by 3, subtracting 2 from both sides of the equation, and dividing both sides of the equation by -2.
D. This is the result of incorrectly subtracting 2 from both sides of the equation, but correctly multiplying both sides of the equation by 3 and dividing both sides of the equation by -2.
Rubric: 1 Point(s)
Standards:
MGSE8.EE.7a
MGSE8.EE.7b
MGSE8.EE.8a
MGSE8.EE.8b
MGSE8.EE.8c

43 Look at the system of equations below.

$$7a - 2b = 9$$
$$a + 2b = -1$$

What is the solution to this system? Solve algebraically, and show your work.

Master ID: 427739 Revision: 5
Rubric: 2 Point(s)
2 The response is correct and complete. A sample 2-point response is shown below. It contains both the correct values for a and b and correct work showing how these values were derived.
1 The response is partially correct.

Accept any answer that contains a correct value for only one value ($a = 1$ or $b = -1$) or displays reversed values for the two variables ($a = -1$, $b = 1$) or exhibits a process that is mostly correct but results in incorrect values for both variables.
0 The response is incorrect or there is no response.
Standards:
MGSE8.EE.7a
MGSE8.EE.7b
MGSE8.EE.8a
MGSE8.EE.8b
MGSE8.EE.8c

Directions: Answer the following question(s).

44 A system of equations is given below.

$$\begin{cases} 2x + 3y = 7 \\ 4x + 6y = 14 \end{cases}$$

How many points of intersection do the graphs of these two equations have?

A. 0
B. 1
C. 2
D. infinitely many

Master ID: 307325 Revision: 3
Correct: D
Rationale:
A. This result comes from seeing that the second equation is a multiple of the first equation, forgetting that the constants cannot be the same multiple as the left sides of the equations.
B. This result comes from making the assumption that all lines intersect in one point.
C. This result comes from making the error that one equation is linear and one is a parabola, so they intersect in two places.
D. In order to solve this system algebraically, use elimination. The final result is 0 = 0, which indicates that there are infinitely many solutions. The two equations can also be written in slope-intercept form, showing that the lines have the same slope and same y-intercept, so they are the same lines.
Rubric: 1 Point(s)
Standards:
MGSE8.EE.7a
MGSE8.EE.7b
MGSE8.EE.8a
MGSE8.EE.8b
MGSE8.EE.8c

45 What is the solution to the equation? Show your work and check your answer.

$$3(x + 2) = -3(x + 4) + 6$$

Master ID: 343848 Revision: 4
Rubric: 2 Point(s)
2 The response is correct and complete. A sample 2-point response is shown below. Accept a correct answer with appropriate work and a check of the answer, as shown.
1 The response is partially correct. This level includes a correct answer with insufficient work or no check of the answer, or an incorrect answer based on minor errors.
0 The response is incorrect or there is no response.
Standards:
MGSE8.EE.7a
MGSE8.EE.7b
MGSE8.EE.8a
MGSE8.EE.8b
MGSE8.EE.8c

Directions: Answer the following question(s).

46 The number of quarters in Sarah's purse is one less than twice the number of dimes she has. If the dimes and quarters total $3.95, how many dimes does she have?

A. 7
B. 9
C. 13
D. 17

Master ID: 2113883 Revision: 3
Correct: A
Rationale:

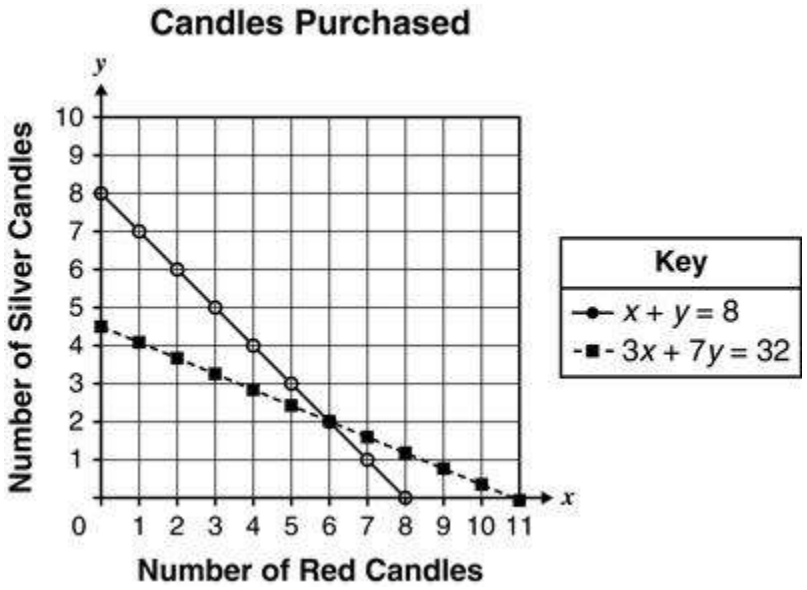
A. This is the result of correctly identifying that two linear equations are needed to solve for the number of dimes and quarters. If d = the number of dimes and q = the number of quarters, then the equations needed are $q = 2d - 1$ and $0.25q + 0.10d = 3.95$. The first equation can be substituted into the second to yield $0.25(2d - 1) + 0.10d = 3.95$, which simplifies to $0.50d - 0.25 + 0.10d = 3.95$ or $0.60d = 4.20$ or $d = 7$. Therefore, there are 7 dimes in Sarah's purse.
B. This is the result of incorrectly using the two following equations to solve for the number of dimes: $d = 2q - 1$ and $0.25q + 0.10d = 3.95$. Then, the number of quarters is chosen as the answer. Note that the first of the equations should be $q = 2d - 1$.
C. This is the result of incorrectly solving for the number of quarters in Sarah's purse.
D. This is the result of incorrectly using the two following equations to solve for the number of dimes: $d = 2q - 1$ and $0.25q + 0.10d = 3.95$. Note that the first of the equations should be $q = 2d - 1$.

Rubric: 1 Point(s)
Standards:
MGSE8.EE.7a
MGSE8.EE.7b
MGSE8.EE.8a
MGSE8.EE.8b
MGSE8.EE.8c

Directions: Answer the following question(s).

47 **Sophie purchased 8 candles at a total cost of $32. The red candles cost $3 each and the silver candles cost $7 each. The equations and graph below can be used to determine the number of each type of candle Sophie purchased, where *x* represents the number of red candles and *y* represents the number of silver candles.**

Number of candles purchased: $x + y = 8$
Total cost of candles: $3x + 7y = 32$



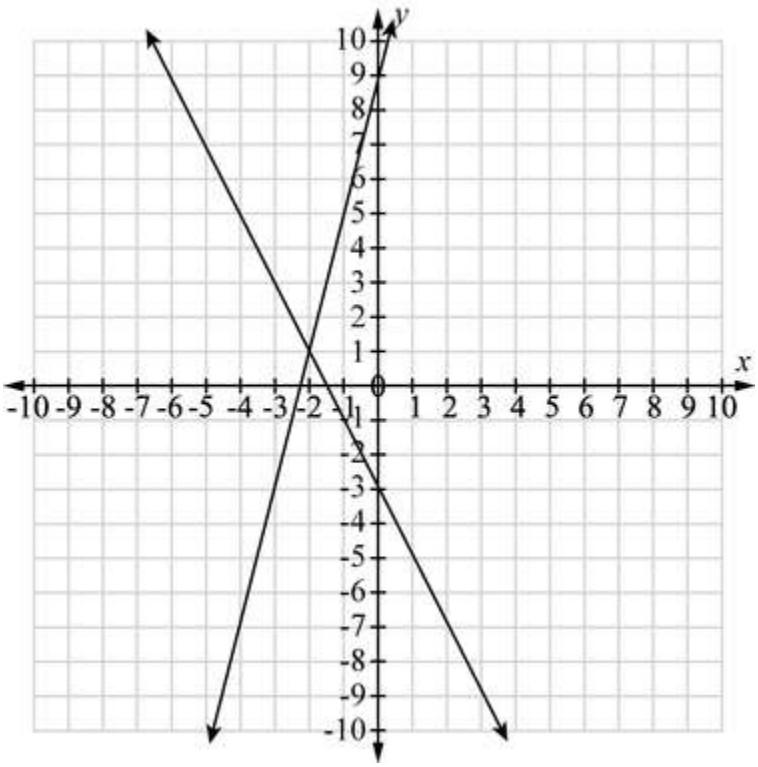
What is the number of red candles and silver candles Sophie purchased?

A. 2 red candles, 6 silver candles
B. 3 red candles, 5 silver candles
C. 6 red candles, 2 silver candles
D. 7 red candles, 1 silver candle

Master ID: 147176 Revision: 1
Correct: C
Rationale:
A. Inverted the abscissa and the ordinate
B. 3 + 5 = 8 total candles purchased
C. **Correct**
D. 7 + 1 = 8 candles purchased
Standards:
MGSE8.EE.8a

Directions: Answer the following question(s).

48 Two lines are graphed on the coordinate plane below.



What is the *y*-coordinate of the solution to the system of equations represented by the lines?

Input #1 Answers

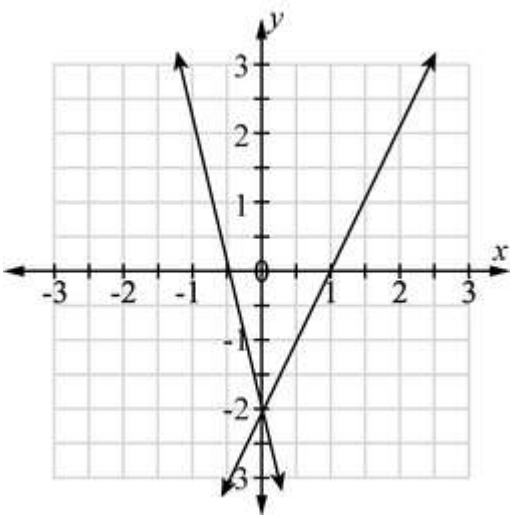
- 1

Master ID: 2506094 Revision: 1
Correct:
Standards:
MGSE8.EE.8a

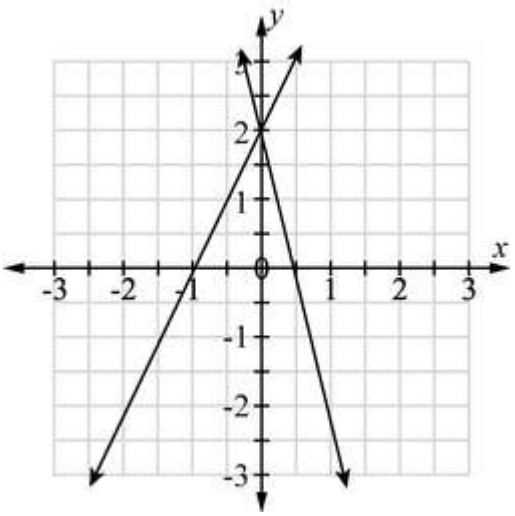
Directions: Answer the following question(s).

49 Kelli looked at a graphical representation of a system of equations and correctly determined that the solution to the system was (0, −2). Which of the following was she looking at?

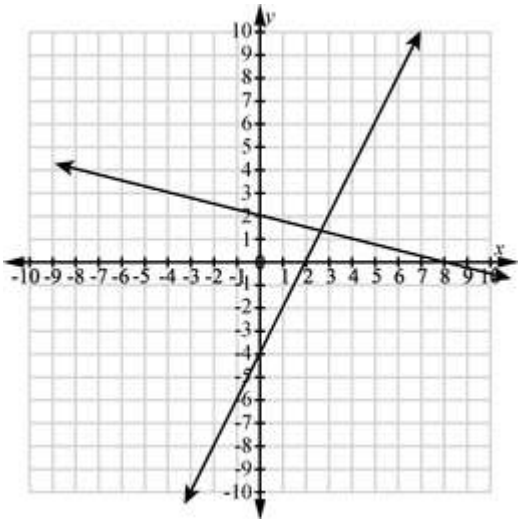
A.



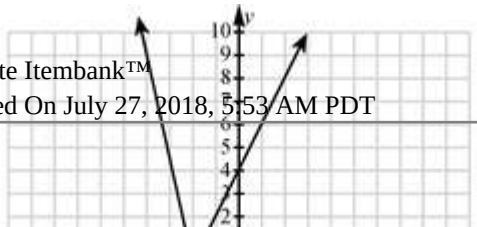
B.



C.



D.



Directions: Answer the following question(s).

Master ID: 1999181 Revision: 1
Correct: A
Standards:
MGSE8.EE.8a

50 The music club raises $65.75 by selling a total of 49 brownies and cupcakes. If each brownie was sold for $1.25 and each cupcake for $1.50, then how many of each item did the club sell?

Write two equations that can be used to identify the number of each item sold. Show your work to solve for the two values.

Master ID: 2113884 Revision: 3
Rubric: 2 Point(s)

2 The response is correct and complete. A sample 2-point response is shown below.

1 The response is partially correct.

A response at this level may contain two correct linear equations with an incorrect simultaneous solution OR may contain one incorrect linear equation with a simultaneous solution that is consistent with the equations given.

0 The response is completely incorrect, there is no response, or the response is off topic.

Standards:
MGSE8.EE.7a
MGSE8.EE.7b
MGSE8.EE.8a
MGSE8.EE.8b
MGSE8.EE.8c

Directions: Answer the following question(s).

51 Which shows the correct way to solve this equation and tells how many solutions it has?

$$-8x - (4 - 2x) = 2(-3x - 6)$$

A. $-8x - (4 - 2x) = 2(-3x - 6)$
$-6x - 4 = -6x - 12$
$-6x + 6x - 4 = -6x + 6x - 12$
$-4 = -12$
no solutions

B. $-8x - (4 - 2x) = 2(-3x - 6)$
$-8x - (2x) = 2(-9x)$
$-10x = -18x$
$-10x + 18x = -18x + 18x$
$8x = 0$
$8x \div 8 = 0 \div 8$
$x = 0$
one solution

C. $-8x - (4 - 2x) = 2(-3x - 6)$
$-6x - 4 = -6x - 4$
$-6x + 6x - 4 = -6x + 6x - 4$
$-4 = -4$
$4 + 4 = 4 + 4$
$0 = 0$
infinitely many solutions

D. $-8x - (4 - 2x) = 2(-3x - 6)$
$-10x - 4 = -6x - 6$
$-10x + 6x - 4 = -6x + 6x - 6$
$-4x - 4 = -6$
$-4x - 4 + 4 = -6 + 4$
$-4x = -2$
$-4x \div (-4) = -2 \div (-4)$
$x = \frac{1}{2}$
one solution

Directions: Answer the following question(s).

Master ID: 307251 Revision: 3
Correct: A
Rationale:

A. This is the result of solving a linear equation until an equivalent equation of the form $a = b$ occurs. This correctly indicates that the equation has no solutions.
B. This is the result of an error made by incorrectly combining the terms in each set of parentheses in the second step, producing $-2x$ on the left side and $-9x$ on the right side of the equation. The answer, $x = 0$, incorrectly indicates one solution for the equation.
C. This is the result of an error made when applying the distributive property to the right hand side of the equation. The second term in parenthesis, –6, is incorrectly added instead of multiplied to the outside term, 2, to give –4. The rest of the steps are performed correctly, resulting in an answer of 0 = 0. This indicates infinitely many solutions to the equation.
D. This is the result of an error made by not applying the distributive property to the second term in parentheses, which allows –6 to remain on the right side of the equation. The rest of the steps are performed correctly, resulting in an answer of $x = 1/2$. This indicates one solution to the equation.

Rubric: 1 Point(s)
Standards:
MGSE8.EE.7a
MGSE8.EE.7b
MGSE8.EE.8a
MGSE8.EE.8b
MGSE8.EE.8c

52

TEACHER READS:

Read the question to yourself and select the best answer.

Olivia added the linear equations $-4x + 9y = 19$ and $5x - 9y = -17$ together and got $x = 2$. She then substituted the value of x back into one of the equations and simplified to get $y = 3$. How many solutions are there to the system of equations?

A. 0
B. 1
C. 2
D. 3

Master ID: 414308 Revision: 1
Correct: B
Rationale:

A. Student(s) may have mistakenly concluded that since the terms with y in them drop out when the two equations are added together, the system of equations has no solution.
B. Correct answer
C. Student(s) may have mistakenly chosen the value of x as the number of solutions to the system of equations.
D. Student(s) may have mistakenly chosen the value of y as the number of solutions to the system of equations.

Standards:
MGSE8.EE.8b

Directions: Answer the following question(s).

53 Which ordered pair is a solution to the system of equations below?

$x - y = 2$

$y = 2x - 4$

A. (0, 2)
B. (3, 2)
C. (4, 2)
D. (2, 0)

Master ID: 1998673 Revision: 1
Correct: D
Standards:
MGSE8.EE.8b

54 **TEACHER READS:**

Read the question to yourself and select the best answer.

Kathleen successfully solved the system of equations $4x + 3y = 15$ and $-5x - 2y = -24$ by multiplying each equation by a constant and adding the two equations together to eliminate the *x*–terms. She then solved for *y* and substituted the value of *y* back into one of the equations and solved for *x*. What could she have multiplied each equation by, and what was her final answer?

A. She could have multiplied the first equation by 4 and the second equation by 5, getting a final answer of $x = -3$ and $y = 6$.
B. She could have multiplied the first equation by 5 and the second equation by 4, getting a final answer of $x = -3$ and $y = 6$.
C. She could have multiplied the first equation by 4 and the second equation by 5, getting a final answer of $x = 6$ and $y = -3$.
D. She could have multiplied the first equation by 5 and the second equation by 4, getting a final answer of $x = 6$ and $y = -3$.

Master ID: 415466 Revision: 1
Correct: D
Rationale:
A. Student(s) may have mixed up the constants by which the two equations must be multiplied in order to eliminate the *x*–terms when the equations are added together, and they may have mixed up the values of *x* and *y* in the final answer.
B. Student(s) may have correctly determined the constants by which the two equations must be multiplied in order to eliminate the *x*–terms when the equations are added together, but they may have mixed up the values of *x* and *y* in the final answer.
C. Student(s) may have correctly determined the final answer, but they may have mixed up the constants by which the two equations must be multiplied in order to eliminate the *x*–terms when the equations are added together.
D. Correct answer
Standards:
MGSE8.EE.8b

Directions: Answer the following question(s).

55

TEACHER READS:

Read and complete the task that follows.

Tamara and Jason work at a widget factory. Tamara arrived at work before Jason and began making widgets. Tamara had already made 20 widgets when Jason began his work. Tamara was producing widgets at a rate of 8 widgets per hour. Jason was able to produce widgets at a rate of 12 widgets per hour. At some point, Tamara and Jason will have produced the same number of widgets.

Part A:
Write a system of equations to represent the situation. Let *x* = hours and *y* = widgets.

Part B:
How much time does it take for Tamara and Jason to produce the same number of widgets?

Part C:
How many widgets will Tamara and Jason have produced?

Master ID: 423559 Revision: 1
Rubric: 2 Point(s)

2 The student demonstrates a thorough understanding of solving real–world problems leading to linear equations in two variables. The student correctly writes the system of equations in Part A, and correctly solves for both variables in Parts B and C.
Part A:
Tamara: $y = 8x + 20$; Jason: $y = 12x$

Part B:
5 hours

Part C:
60 widgets

1 The student demonstrates a partial understanding of solving real–world problems leading to linear equations in two variables. The student correctly writes the system of equations in Part A, but may not solve them correctly.

0 The student demonstrates limited or no understanding of solving real–world problems leading to linear equations in two variables. The student did not write the correct equations and did not solve correctly.

Standards:
MGSE8.EE.8c

Directions: Answer the following question(s).

56 Branson turns to an assignment in her math workbook. A printing error has resulted in missing text on the page. When she gets to question #5 the equation is cut off, with only the left side printed as shown below.

$$3x + 2(4x - 1) =$$

Branson looks in the back of the book at the answer key and sees that the answer to question #5 is $x = -1$. Which of these could be the missing text from the right side of the equation?

A. $-13x$

B. $5x - 8$

C. $4(2 + 5x)$

D. $-3x - 2(4x - 1)$

Master ID: 2113801 Revision: 3

Correct: B

Rationale:

A. This answer results from substituting $x = -1$ into the left side of the equation and finding the value –13. However, if the right side of the equation were $-13x$, then it would solve as $x = 1/12$, not $x = -1$.

B. Expanding the left side of the equation gives $3x + 8x - 2 =$. Combining like terms gives $11x - 2 =$. If you set this equal to $5x - 8$, you can solve for the value of x: $11x - 2 = 5x - 8$, $11x + 6 = 5x$, $6 = -6x$, $-1 = x$.

C. This answer results from expanding $2(4x - 1)$ on the left side of the equation as $8x - 1$ instead of $8x - 2$.

D. This answer results from multiplying the left side of the equation by –1. However, if the right side of the equation were $-3x - 2(4x - 1)$, then it would solve as $x = 2/11$, not $x = -1$.

Rubric: 1 Point(s)

Standards:

MGSE8.EE.7a
MGSE8.EE.7b
MGSE8.EE.8a
MGSE8.EE.8b
MGSE8.EE.8c

Directions: Answer the following question(s).

57

TEACHER READS:

Read the question to yourself and select the best answer.

Yuka earns frequent flyer miles from 2 airlines. In 2011, she flew 20,000 miles with Airline A and 10,000 miles with airline B, and the combined value of her miles was $700. In 2012, she flew 10,000 miles with Airline A and 20,000 with Airline B, and the combined value of her miles was $800. Which of these is a correct statement?

A. Airline A's miles are worth $0.02 each, which is less than Airline B's miles are worth.

B. Airline A's miles are worth $0.02 each, which is more than Airline B's miles are worth.

C. Airline A's miles are worth $0.03 each, which is less than Airline B's miles are worth.

D. Airline A's miles are worth $0.03 each, which is more than Airline B's miles are worth.

Master ID: 415468 Revision: 1

Correct: A

Rationale:

A. Correct answer

B. Student(s) may have correctly determined the value of Airline A's miles, but they may have mistakenly determined that Airline B's miles are worth less than Airline A's miles.

C. Student(s) may have correctly determined that Airline A's miles are worth less than Airline B's miles, but they may have mistakenly attributed the value of Airline B's miles to Airline A.

D. Student(s) may have mistakenly attributed the value of Airline B's miles to Airline A, and they may have mistakenly determined that Airline B's miles are worth less than Airline A's miles.

Standards:

MGSE8.EE.8c

Continue: Turn to the next page.

Directions: Answer the following question(s).

58 What is the y-value of the solution to the system of equations shown below?

$$\begin{cases} y = 2x - 6 \\ y = 5x - 21 \end{cases}$$

A. 4
B. 5
C. 9
D. 12

Master ID: 307322 Revision: 4
Correct: A
Rationale:

A. Substitute the right half of the top equation for the y in the second equation, getting $2x - 6 = 5x - 21$. Solving this equation gives $x = 5$. Then substitute 5 for x in either of the two equations.
B. This is the result of solving the system for x and failing to find the value of y.
C. This is the result of setting up the equation as $5x - 21 = 2x - 6$, but getting $3x = 27$ as the next step due to ignoring the negative sign in front of the 6, then using the solution to this equation as the final answer.
D. This is the result of setting up the equation as $5x - 21 = 2x - 6$, but getting $3x = 27$ as the next step after ignoring the negative sign in front of the 6. The solution to this equation is correctly found to be 9, and then 9 is substituted into the top equation, getting $y = 12$.

Rubric: 1 Point(s)
Standards:
MGSE8.EE.7a
MGSE8.EE.7b
MGSE8.EE.8a
MGSE8.EE.8b
MGSE8.EE.8c

Directions: Answer the following question(s).

59 A system of linear equations is given below.

$$\begin{cases} 2x + 8y = 28 \\ 2x + 8y = 29 \end{cases}$$

How many solutions does this system have?

A. 0
B. 1
C. 2
D. infinitely many

Master ID: 307324 Revision: 3
Correct: A
Rationale:
A. This problem can be solved by multiplying the bottom equation by -1 and then adding both equations. This gives the equation 0 = -1, which is never true so there is no solution. Or, it can be solved by rewriting both equations in point-slope form, which reveals that the lines are parallel and thus there are no solutions.
B. This is a common result for the number of solutions for a system of linear equations.
C. This is a possible result when solving a system of equations, but these equations cannot both be linear.
D. This is a common result for the number of solutions for a linear system of equations.
Rubric: 1 Point(s)
Standards:
MGSE8.EE.7a
MGSE8.EE.7b
MGSE8.EE.8a
MGSE8.EE.8b
MGSE8.EE.8c

Directions: Answer the following question(s).

60 **Which of the following does NOT represent a function of *x* ?**

A.

x	*y*
−4	2
0	−3
2	5
4	−3

B.

x	*y*
−1	−6
1	−6
3	4
6	7

C.

x	*y*
−1	3
−1	5
2	6
3	4

D.

x	*y*
−1	2
2	5
3	4
4	−3

Master ID: 155454 Revision: 1
Correct: C
Rationale:
A. Does not recognize a functional relationship
B. Does not recognize a functional relationship
C. **Correct**
D. Does not recognize a functional relationship
Standards:
MGSE8.F.1

Directions: Answer the following question(s).

61 **The following ordered pairs (*x*, *y*) define the relation *Q*. Is *Q* a function?**

$$\{(-2, 1), (-1, 2), (1, 1), (2, -1)\}$$

A. Yes, because there is exactly one *y*-value for every *x*-value.
B. Yes, because there is exactly one *x*-value for every *y*-value.
C. No, because there is more than one *x*-value for some *y*-values.
D. No, because there is more than one *y*-value for every *x*-value.

Master ID: 149256 Revision: 1
Correct: A
Rationale:
A. **Correct**
B. Reversed the variables *x* and *y*
C. Confused *x*- and *y*-values since there are *y*-values that repeat
D. Chose this option because there are *y*-values that repeat
Standards:
MGSE8.F.1

62 **Which ordered pair** (x, y) **makes the relation a function?**

$$\{(3, 4), (-2, 6), (5, 5), (-4, 6), (x, y)\}$$

A. $(-4, 4)$
B. $(-2, 5)$
C. $(0, 6)$
D. $(3, 6)$

Master ID: 149250 Revision: 1
Correct: C
Rationale:
A. Repeats for -4
B. Repeats for -3
C. **Correct**
D. Repeats for 3
Standards:
MGSE8.F.1

Directions: Answer the following question(s).

63 Ellen and Oscar are running a race. Ellen runs the first mile in 8 minutes, and then each additional mile in 11 minutes. Oscar's speed is represented in the function $t = 10m$, where t is the number of minutes it takes him to run m miles. Which statement is true?

A. If the race is 3 miles long, Ellen and Oscar finish at the same time.
B. If the race is 2 miles long, Oscar finishes ahead of Ellen.
C. If the race is 4 miles long, Ellen finishes ahead of Oscar.
D. If the race is 1 mile long, Oscar finishes ahead of Ellen.

Master ID: 307386 Revision: 4
Correct: A
Rationale:
A. Ellen takes 8 + 2(11) minutes, or 30 minutes, to run a 3-mile race; Oscar takes 10(3) = 30 minutes.
B. This answer overestimates the effect of Ellen's slowdown in the second mile; Ellen finishes a 2-mile race in 8 + 11 = 19 minutes, while Oscar take 2(10) = 20 minutes.
C. This answer overestimates the effect of Ellen's faster first mile; in 4 miles she takes 8 + 3(11) = 41 minutes, while Oscar takes 4(10) = 40 minutes.
D. This answer disregards Ellen's faster first mile and compares her slower later race speed of 11 min/mile to Oscar's speed of 10 min/mile.
Rubric: 1 Point(s)
Standards:
MGSE8.F.1
MGSE8.F.2
MGSE8.F.3

64 The speed of a car is changing according to the equation $y = -4x + 50$, where x = the time in seconds and y = the speed in miles per hour. Which is a true statement about this equation?

A. It is a linear equation, and its graph is a straight line.
B. It is a linear equation, but its graph is not a straight line.
C. It is not a linear equation, but its graph is a straight line.
D. It is not a linear equation, and its graph is not a straight line.

Master ID: 307397 Revision: 4
Correct: A
Rationale:
A. Any equation of the form $y = mx + b$ is a linear equation, and the graph of any linear equation is a straight line.
B. This fails to recognize that the graph of a linear equation is always a straight line.
C. This fails to recognize that the equation is linear, although it does correctly state that the graph is a straight line.
D. This fails to recognize that the equation is linear and its graph is a straight line.
Rubric: 1 Point(s)
Standards:
MGSE8.F.1
MGSE8.F.2
MGSE8.F.3

Directions: Answer the following question(s).

65 Look at this function.

$$f(x) = -\frac{x}{2} + 4$$

What is $f(-1)$?

A. $\frac{3}{2}$

B. $\frac{5}{2}$

C. $\frac{7}{2}$

D. $\frac{9}{2}$

Master ID: 307346 Revision: 4
Correct: D
Rationale:
A. This results from finding [(-1) + 4]/ 2.
B. This results from finding [-(-1) + 4]/ 2.
C. This results from making a sign error and finding -1/2 + 4.
D. This is correct as follows: $f(-1) = -(-1)/2 + 4 = 1/2 + 8/2 = 9/2$.
Rubric: 1 Point(s)
Standards:
MGSE8.F.1
MGSE8.F.2
MGSE8.F.3

Directions: Answer the following question(s).

66 **The Semmes Library will raise funds by selling bumpers stickers. The equation $p = 2s - 20$ is used to calculate the profit the library earns (p) if a certain number of bumper stickers (s) are sold. Which table has values that correspond to the equation?**

A.

Fundraiser Profit

Stickers Sold	Profit ($)
10	40
11	42
12	44
13	46

B.

Fundraiser Profit

Stickers Sold	Profit ($)
1	2
2	4
3	6
4	8

C.

Fundraiser Profit

Stickers Sold	Profit ($)
1	18
2	16
3	14
4	12

D.

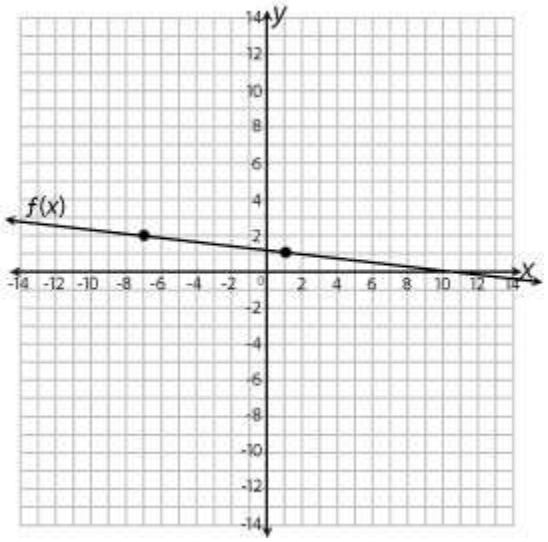
Fundraiser Profit

Stickers Sold	Profit ($)
10	0
12	4
14	8
16	12

Master ID: 146902 Revision: 1
Correct: D
Rationale:
A. $2s + 20$ is used instead of $2s - 20$
B. The rate of change is used without subtracting the constant term of 20
C. $20 - 2s$ is used instead of $2s - 20$
D. **Correct**
Standards:
MGSE8.F.2

Directions: Answer the following question(s).

67 Fabian plots the linear function $f(x)$ below.



Gina graphs $g(x)$, which is a straight line that passes through $(0, 8)$ and $(8, 7)$.

Which of these correctly describes the slopes of $f(x)$ and $g(x)$?

A. Both $f(x)$ and $g(x)$ have a slope of $-\frac{1}{8}$.

B. Both $f(x)$ and $g(x)$ have a slope of –8.

C. $f(x)$ has a slope of $-\frac{1}{8}$ and $g(x)$ has a slope of –8.

D. $f(x)$ has a slope of –8 and $g(x)$ has a slope of $-\frac{1}{8}$.

Master ID: 2113928 Revision: 3
Correct: A
Rationale:

A. This is the result of noting that the graph of $f(x)$ passes through the points (–7, 2) and (1, 1). The slope of this line is therefore given by m = (1 – 2)/(1 – (–7)) = –1/8. Since $g(x)$ passes through the points (0, 8) and (8, 7), its slope is given by m = (7 – 8)/(8 – 0) =–1/8. Therefore, both lines have the same slope of –1/8.

B. This is the result of calculating the slope of both lines as the run divided by the rise instead of the rise divided by the run.

C. This is the result of correctly determining the slope of $f(x)$ but not recognizing that the slope of $g(x)$ is the same as $f(x)$.

D. This is the result of correctly determining the slope of $g(x)$ but not recognizing that the slope of $f(x)$ is the same as $g(x)$.

Rubric: 1 Point(s)
Standards:
MGSE8.F.1
MGSE8.F.2
MGSE8.F.3

Directions: Answer the following question(s).

68 The ordered pair (2, 9) represents an input and output for a given function g.

Explain why it is not possible for (2, 0) to also represent an input and output for g.

Master ID: 2113905 Revision: 3
Rubric: 2 Point(s)

2 The response is correct and complete. A sample 2-point response is shown below.

Accept any response that recognizes that for g to be a function, there must be only one output for each input.

1 The response is partially correct.

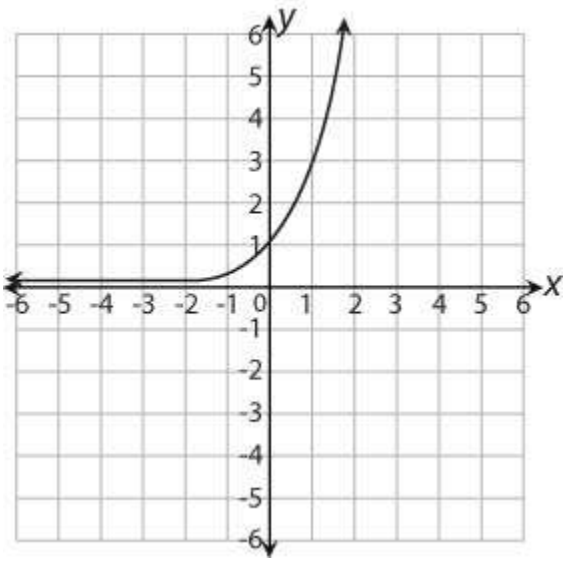
A response at this level may correctly state that there must be one output for each input but not clearly tie it to this example using (2, 9) and (2, 0).

0 The response is completely incorrect, there is no response, or the response is off topic.

Standards:
MGSE8.F.1
MGSE8.F.2
MGSE8.F.3

Directions: Answer the following question(s).

69 Connie compared two functions. Function A is described by the equation $2x + y = 7$. Function B is graphed below.



Which statement is correct?

A. The domains of both functions are the same, but the ranges are different.

B. The ranges of both functions are the same, but the domains are different.

C. Both the domains and ranges of both functions are the same.

D. Both the domains and ranges of both functions are all different.

Master ID: 2206244 Revision: 4

Correct: A

Rationale:

A. Both functions have the domain of all real numbers. Function A has a range of all real numbers, but function B has a range of $x > 0$.

B. This is the result of switching the domain and the range.

C. This is the result of misinterpreting the ranges.

D. This is the result of misinterpreting the domains.

Rubric: 1 Point(s)

Standards:

MGSE8.F.1
MGSE8.F.2
MGSE8.F.3

Directions: Answer the following question(s).

70 A certain kind of cheese costs $\$ 6.98$ per pound. A function describes the cost of x pounds of cheese.

Classify the function as linear or nonlinear and explain why.

Master ID: 2505473 Revision: 1
Rubric: 2 Point(s)

Answer

The function is a linear function because the cost of buying cheese increases as a constant multiple of the number of pounds that are purchased. Written as an equation, the function is $c = 6.98x$.

Scoring Rubric

Points	Description
2	The response achieves the following: ● Notes that the function is linear ● Explains that the cost of cheese increases as a constant multiple of the number of pounds purchased
1	The response achieves the following: ● Notes that the function is linear ● Makes some attempt at further explanation but does not provide justification for why the function is linear
0	The response achieves the following: ● Provides incorrect answer

Standards:
MGSE8.F.3

71 A linear function is defined as $y = \frac{1}{3}x + 1$.

Graph the line of a DIFFERENT linear function which has the same rate of change but crosses the y -axis at a point that is exactly one unit higher.

You must graph the line using only two points; any other graphed points will cause the line to be scored as incorrect.

Web Only Interaction

Master ID: 2113939 Revision: 4
Rubric: 1 Point(s)

The original function is of the form $y = mx + b$ where b is the point at which the function crosses the y-axis (y-intercept) and the rate of change is m. Thus, if a line has the same rate of change but cross the y-axis at a point that is one unit higher, or $b + 1 = 2$, it will be the equation $y = (1/3)x + 2$.

Standards:
MGSE8.F.1
MGSE8.F.2
MGSE8.F.3

Directions: Answer the following question(s).

72 Lenny graphs the linear function $f(x)$ according to the values shown in the table below.

x	$f(x)$
–5	–11
7	7

He then graphs another linear function $g(x)$ that passes though the points $(-3, -8.5)$ and $(3, 2)$. Which statement is TRUE about the functions that Lenny graphs?

A. The slope of $g(x)$ is greater than the slope of $f(x)$.

B. The slope of $f(x)$ is greater than the slope of $g(x)$.

C. The x-intercept of $g(x)$ is greater than the x-intercept of $f(x)$.

D. The y-intercept of $f(x)$ is greater than the y-intercept of $g(x)$.

Master ID: 490900 Revision: 4

Correct: A

Rationale:

A. This is the result of recognizing that $f(x)$ passes through the points (–5, –11) and (7, 7), which means that the slope of this function is given by $m = (7 - (-11))/(7 - (-5)) = 18/12 = 1.5$. Since $g(x)$ passes though the points (–3, –8.5) and (3, 2), its slope is given by $m = (2 - (-8.5))/(3 - (-3)) = 10.5/6 = 1.75$. Therefore the slope of $g(x)$, 1.75, is greater than the slope of $f(x)$, 1.5.

B. This is the result of not recognizing that the slope of $f(x)$ is 1.5 and the slope of $g(x)$ is 1.75.

C. This is the result of not recognizing that the x-intercept of $f(x)$ is 7/3 and the x-intercept of $g(x)$ is 13/7. Since 13/7 < 7/3, the x-intercept of $g(x)$ is less than the x-intercept of $f(x)$.

D. This is the result of not recognizing that the y-intercept of $f(x)$ is –3.5 and the y-intercept of $g(x)$ is –3.25. Since –3.5 < –3.25, the y-intercept of $f(x)$ is less than the y-intercept of $g(x)$.

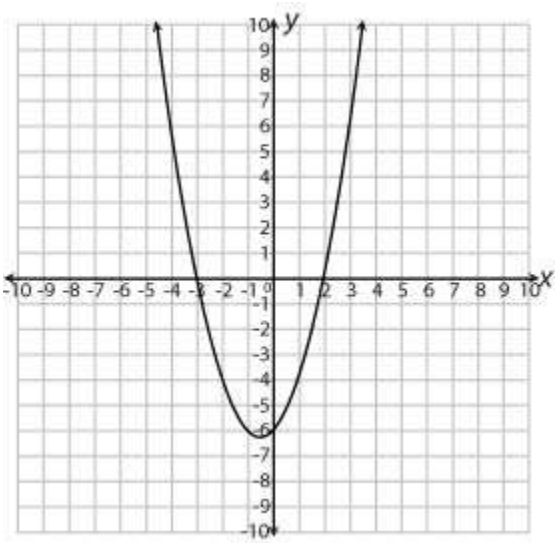
Rubric: 1 Point(s)

Standards:

MGSE8.F.1
MGSE8.F.2
MGSE8.F.3

Directions: Answer the following question(s).

73 Ryan graphs the function $f(x)$ shown in the graph below.



Elaina graphs a linear function with the same y-intercept and positive x-intercept as $f(x)$. Which function does she graph?

A. $y = 3x - 6$
B. $y = -2x - 6$
C. $y = -3x + 6$
D. $y = 2x + 6$

Master ID: 548355 Revision: 4
Correct: A
Rationale:

A. This is the result of correctly choosing a function that passes through the y-intercept of (0, –6) and the positive x-intercept of (2, 0). This linear function has a slope of $m = (0 - (-6))/(2 - 0) = 6/2 = 3$ and a y-intercept of –6, which gives an equation in slope-intercept form of $y = 3x - 6$.
B. This is the result of incorrectly identifying a function that has the same y-intercept (0, –6) and negative x-intercept (–3, 0) as $f(x)$.
C. This is the result of incorrectly identifying a function that has the same positive x-intercept as $f(x)$ but that passes through (0, 6) instead of (0, –6).
D. This is the result of incorrectly identifying a function that has the same negative x-intercept as $f(x)$ and that passes through (0, 6) instead of (0, –6).

Rubric: 1 Point(s)
Standards:
MGSE8.F.1
MGSE8.F.2
MGSE8.F.3

Directions: Answer the following question(s).

74 A computer technician charges a fixed amount for a repair, plus an additional amount per hour. The equation below describes y, the total amount the technician charges, in dollars, based on x hours for the repair.

$$y = 45x + 75$$

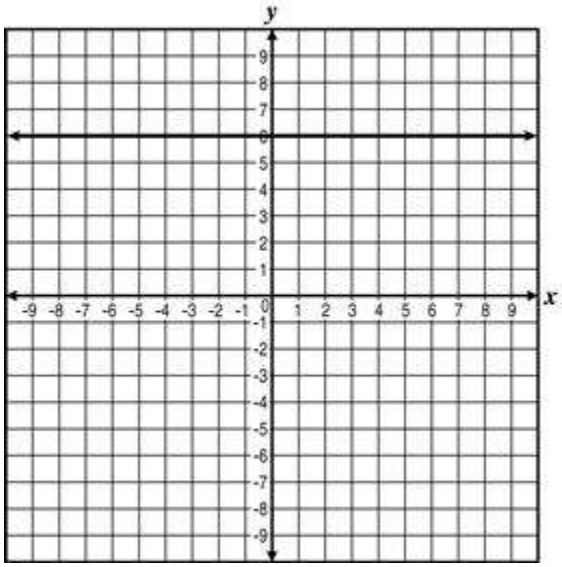
What is the meaning of the initial amount for the equation?

A. It means the technician charges a fixed amount of $75 for the repair.
B. It means the technician charges a fixed amount of $45 for the repair.
C. It means the technician charges $45 per hour for the repair.
D. It means the technician charges $75 per hour for the repair.

Master ID: 307421 Revision: 4
Correct: A
Rationale:
A. The initial amount for the equation is $75, and the rate of change is the additional $45 per hour.
B. This uses the rate of change for the equation.
C. This confuses the rate of change with the initial amount.
D. This uses the correct initial amount, but the rate of change is not the same as the initial amount.
Rubric: 1 Point(s)
Standards:
MGSE8.F.4
MGSE8.F.5

Directions: Answer the following question(s).

75 **What is the slope of the line graphed below?**

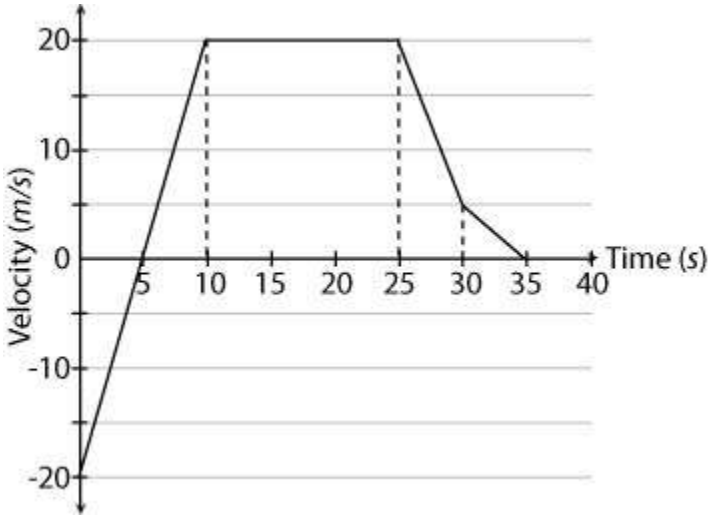


A. undefined
B. 0
C. 1
D. 6

Master ID: 154733 Revision: 1
Correct: B
Rationale:
A. Confused with the slope of a vertical line
B. **Correct**
C. Calculated the slope as 1 since it is straight across
D. Confused slope with the *y*-intercept
Standards:
MGSE8.F.4

Directions: Answer the following question(s).

76 A particle moves according to the velocity versus time graph shown below.



Describe the particle's velocity in detail from the time $t = 0$ to $t = 40$ seconds.

Master ID: 2114014 Revision: 3
Rubric: 2 Point(s)

2 The response is correct and complete. A sample 2-point response is shown below.

1 The response is partially correct.

A response at this level includes an incomplete description OR a description that contains one or two minor errors.

0 The response is incorrect or there is no response.

Standards:
MGSE8.F.4
MGSE8.F.5

77 What is the equation of the line that passes through points (3, −3) and (−3, −3)?

A. $x = -3$
B. $y = 3$
C. $y = -3$
D. $x = y$

Master ID: 1998817 Revision: 1
Correct: C
Standards:
MGSE8.F.4

Directions: Answer the following question(s).

78 **What is the value of *y* if the slope of a line is 3 and two points on the line are** $(0, y)$ **and** $(2, 4)$?

A. -10
B. -2
C. 10
D. 14

Master ID: 143751 Revision: 1
Correct: B
Rationale:

A. Mixed coordinates; slope $= \frac{y-2}{0-4} = 3; \frac{y-2}{-4} = 3; y-2 = -12; y = -10$

B. **Correct**

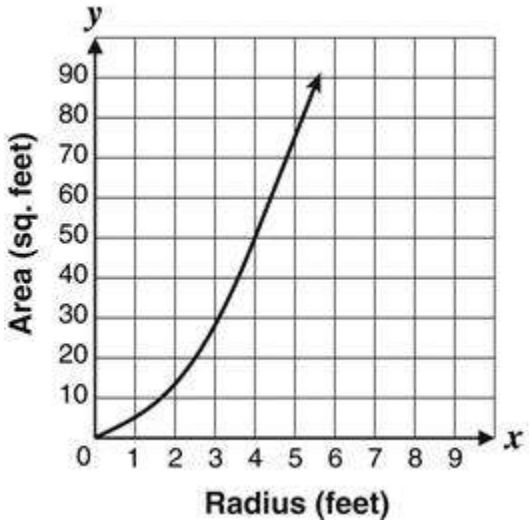
C. Mixed coordinates $\frac{y-4}{2-0} = 3; \frac{y-4}{2} = 3; y-4 = 6; y = 10$

D. Mixed coordinates $\frac{y-2}{4-0} = 3; \frac{y-2}{4} = 3; y-2 = 12; y = 14$

Standards:
MGSE8.F.4

Directions: Answer the following question(s).

79 **The function $A = \pi r^2$ gives the area *A* of a circle with radius *r*.**



Using the graph of the function shown, which measurement is closest to the radius of a circle whose area is 45 square feet?

A. 2.1 feet
B. 3.3 feet
C. 3.8 feet
D. 4.2 feet

Master ID: 141078 Revision: 1
Correct: C
Rationale:
A. Did not look at graph; instead, computed $\sqrt{45} \div 3.14$
B. Used 35 for volume
C. **Correct**
D. Used 55 for volume
Standards:
MGSE8.F.5

Directions: Answer the following question(s).

80 A heater repairman charges $40 to visit a home, plus $70 per hour for the time he spends on the repair. This situation can be described by an equation of the form $y = mx + b$, where x = the time in hours and y = the cost in dollars. What is the value of b in this equation?

A. 30
B. 40
C. 70
D. 110

Master ID: 307432 Revision: 4
Correct: B
Rationale:
A. This results from subtracting 70 – 40.
B. The value of b is the initial cost, 40 dollars.
C. This is the rate of change, or the value of m in the equation.
D. This results from adding 70 + 40.
Rubric: 1 Point(s)
Standards:
MGSE8.F.4
MGSE8.F.5

Directions: Answer the following question(s).

81 The table shows three points on the graph of a line.

x	y
1	12
2	17
3	22

What is the value of the y-coordinate where the line crosses the y-axis?

A. 5
B. 7
C. 10
D. 12

Master ID: 307428 Revision: 4
Correct: B
Rationale:
A. This is the slope of the line.
B. The y-value increases by 5 units for each 1 unit increase in the value of x. When $x = 0$, the value of y is $12 – 5 = 7$. In other words, the y-intercept is the point (0, 7).
C. This is the result of subtracting 22 – 12.
D. This is the value of y when $x = 1$.
Rubric: 1 Point(s)
Standards:
MGSE8.F.4
MGSE8.F.5

Directions: Answer the following question(s).

82 On Tuesday it cost Ms. Evans $12 to park her car in a parking garage for 2 hours. On Wednesday it cost her $22.50 to park in the same garage for 5 hours. Based on these two fees, what is the hourly rate for parking in the garage?

A. $3.50
B. $4.50
C. $5.25
D. $6.00

Master ID: 2113977 Revision: 3
Correct: A
Rationale:
A. Calculating the rate of change from the 2-hour cost to the 5-hour cost gives (22.50 – 12.00)/(5 – 2) = 10.5/3 = $3.50. The rate of change represents the increase in cost for each additional hour, or the hourly rate. Note that the initial value, or flat fee for parking in the garage, is $5.00.
B. This is the result of dividing $22.50 by 5.
C. This is the result of calculating individual rates for the 2-hour cost ($6.00) and the 5-hour cost ($4.50) and averaging them.
D. This is the result of dividing $12 by 6.
Rubric: 1 Point(s)
Standards:
MGSE8.F.4
MGSE8.F.5

Directions: Answer the following question(s).

83 Which function is represented by this table?

x	y
1	4
2	5
3	6
4	7
5	8

A. $y = x + 3$
B. $y = x + 1$
C. $y = 4x$
D. $y = 2x$

Master ID: 307447 Revision: 3
Correct: A
Rationale:
A. Each y-value is 3 more than the corresponding x-value, so the equation is $y = x + 3$.
B. This answer adds 1 because the x- and y-values are increasing by 1s.
C. This equation is true for the first row of the table only.
D. This equation is true for the third row of the table only.
Rubric: 1 Point(s)
Standards:
MGSE8.F.4
MGSE8.F.5

84 Is π a rational or irrational number?

A. irrational, because it is a symbol and not a number
B. rational, because it can be written as $\frac{22}{7}$
C. irrational, because its decimal expansion does not repeat
D. rational, because its decimal expansion eventually repeats

Master ID: 1999593 Revision: 1
Correct: C
Standards:
MGSE8.NS.1

Directions: Answer the following question(s).

85 The distance between Earth and Mars varies depending on where each planet is in its orbit of the Sun. When the two planets are closest, they are around 4×10^{7} miles apart. When the distance between the planets is greatest, they are about 7 times farther apart than when they are nearest each other. **About** how far apart are Earth and Mars when they are farthest apart?

A. 3×10^{7} miles

B. 3×10^{8} miles

C. 4×10^{14} miles

D. 4×10^{49} miles

Master ID:	2505719 Revision:	1
Correct:	B	
Standards:		
MGSE8.EE.3		

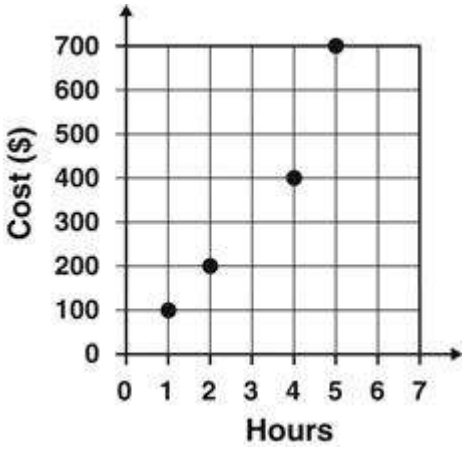
Directions: Answer the following question(s).

86 **The principal of a middle school decided to rent a tent for the school fair. The table below shows the cost of the tent for different amounts of time.**

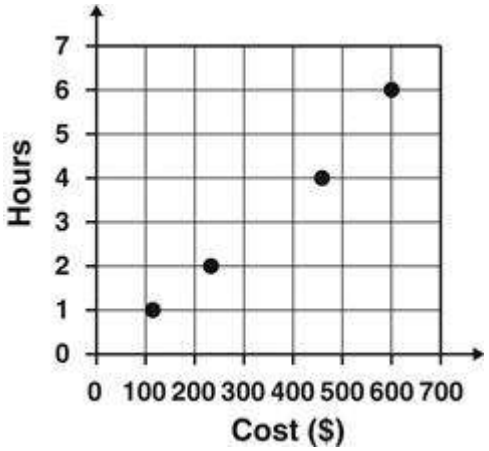
Hours	Cost ($)
1	115
2	230
4	460
6	690

Which graph BEST represents the table?

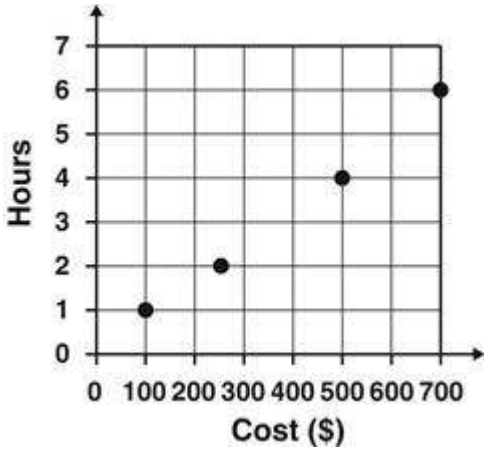
A.



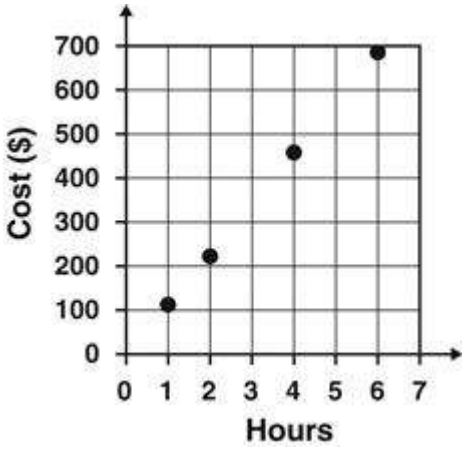
C.



B.



D.



Directions: Answer the following question(s).

Master ID: 141882 Revision: 1
Correct: D
Rationale:

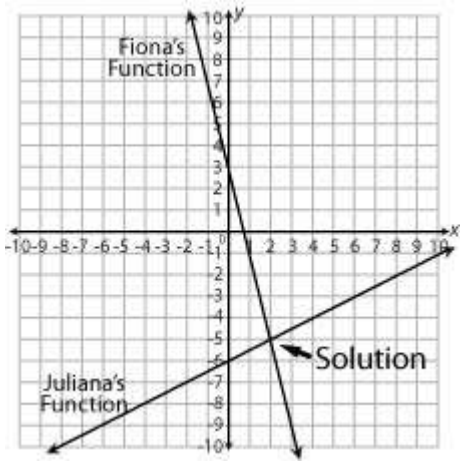
A. Incorrect position of points on graph
B. Dependent and independent values transposed and points incorrect
C. Dependent and independent values transposed and last point incorrect
D. **Correct**

Standards:
MGSE8.EE.5

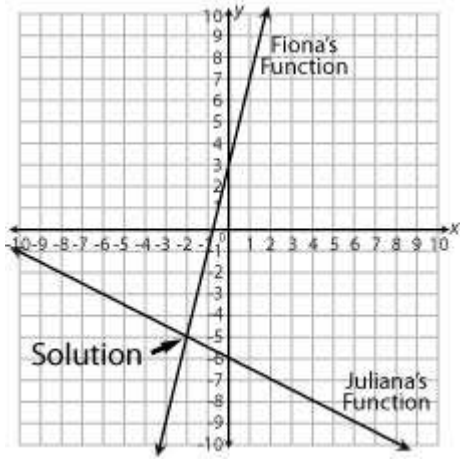
Directions: Answer the following question(s).

87 Juliana plots the function $y = 0.5x - 6$ on a coordinate plane, and Fiona plots the function $y = -4x + 3$. Which of these correctly shows the functions that they plot as well as the solution to their system of equations?

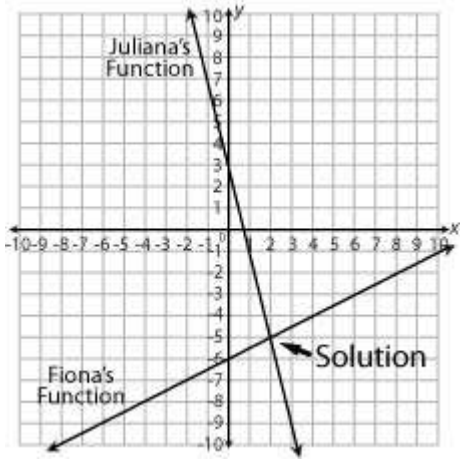
A.



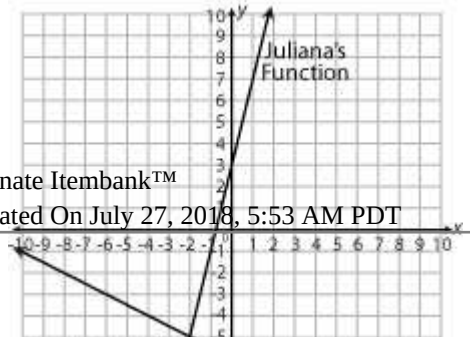
B.



C.



D.



Directions: Answer the following question(s).

Master ID: 347131 Revision: 5
Correct: A
Rationale:
A. This is the result of correctly identifying that Juliana's function ($y = 0.5x - 6$) passes through the points (0, –6) and (4, –4) and that Fiona's function ($y = -4x + 3$) passes through the points (0, 3), and (3, –9). It is then noted that these functions intersect at the point (2, –5).
B. This is the result of incorrectly plotting Juliana's function as $y = -0.5x - 6$ and Fiona's function as $y = 4x + 3$. The solution of this system of equations is then graphically identified as (–2, –5).
C. This is the result of correctly plotting Juliana's and Fiona's functions along with the solution but then incorrectly switching their names.
D. This is the result of incorrectly plotting Fiona's function as $y = -0.5x - 6$ and Juliana's function as $y = 4x + 3$. The solution of this system of equations is then graphically identified as (–2, –5).
Rubric: 1 Point(s)
Standards:
MGSE8.EE.7a
MGSE8.EE.7b
MGSE8.EE.8a
MGSE8.EE.8b
MGSE8.EE.8c

88 **Select the correct option from the menu.**

Raj determined that the equation $3(x + 3) = 8x - 5x + 7$ **is equivalent to 9 = 7. This means that this equation has** [ ]**.**

A. no solution
B. one solution
C. two solutions
D. infinitely many solutions

Master ID: 1972536 Revision: 1
Correct: A
Rationale:
A. **Correct**
B. Solved incorrectly and obtained a solution
C. Thought that 9 and 7 were the solutions
D. Thought that if the variable terms ‘disappeared’ then there were infinitely many solutions
Standards:
MGSE8.EE.7a

Directions: Answer the following question(s).

89 What is the value of t in the equation $3t + 5(6 - t) = 4$?

Input #1 Answers

- 13

Master ID: 2505929 Revision: 1
Correct:
Standards:
MGSE8.EE.7b

90 Which function is not linear?

A. $y = (x - 3)^2$

B. $y = \frac{8}{3}x$

C. $y - 7 = 2(x + 4)$

D. $5x - 6y = 17$

Master ID: 307399 Revision: 3
Correct: A
Rationale:
A. This function is quadratic, not linear.
B. This equation represents a function with a fractional slope, which is linear.
C. This equation represents a line in point-slope form.
D. This equation represents a line in general form.
Rubric: 1 Point(s)
Standards:
MGSE8.F.1
MGSE8.F.2
MGSE8.F.3