

**Directions:** Please choose the best answer choice for each of the following questions.

1. What are the possible values for  $x$  in the following inequality?

$$2x - 12 \geq 7 + x$$

- A.  $x \geq -5$
- B.  $x \geq 19$
- C.  $x \geq -\frac{5}{3}$
- D.  $x \geq \frac{19}{3}$

2. Look at the system of equations below.

$$\begin{cases} x + y = 12 \\ 2x + 3y = 26 \end{cases}$$

Which of these shows a way that one of the equations could be rewritten in order to solve the system?

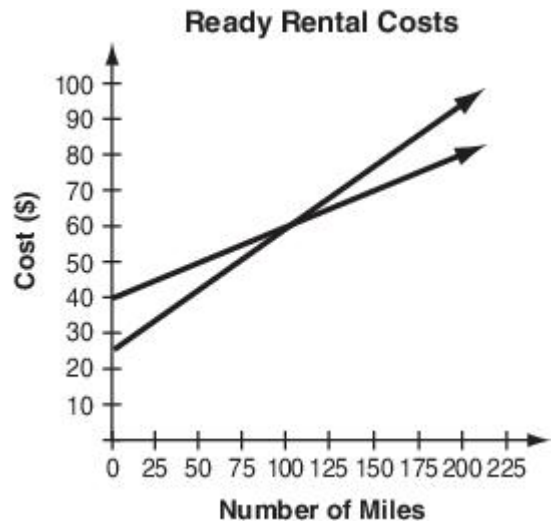
- A.  $\begin{cases} -x - y = 12 \\ 2x + 3y = 36 \end{cases}$
- B.  $\begin{cases} -2x - 2y = 24 \\ 2x + 3y = 26 \end{cases}$
- C.  $\begin{cases} 3x - 3y = 36 \\ 2x + 3y = 25 \end{cases}$
- D.  $\begin{cases} -2x - 2y = -24 \\ 2x + 3y = 26 \end{cases}$

3. What is the solution to the system of equations below?

$$\begin{aligned} y &= 3x - 20 \\ 2x + y &= 10 \end{aligned}$$

- A. (6, 2)
- B. (6, -2)
- C. (10, 10)
- D. (10, -10)

4. The cost of renting a vehicle depends on the number of miles the vehicle is driven. At Ready Rental, a car can be rented for \$25 plus 35 cents per mile. The rental price for a van is \$40 plus 20 cents per mile.

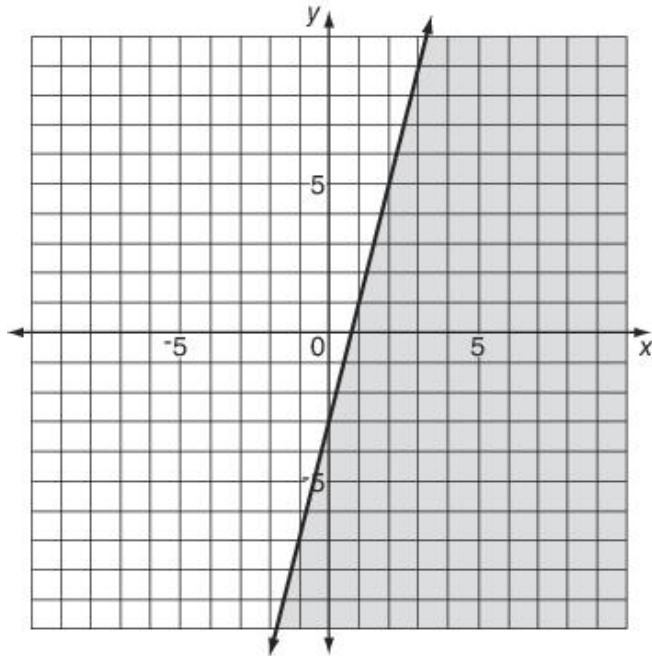


Use the graph to determine the number of miles you would need to drive for the rental costs to be equal.

- A. 60 miles
  - B. 70 miles
  - C. 100 miles
  - D. 140 miles
5. What is the solution to  $f(x) = g(x)$ , given  $f(x) = 2x - 24$  and  $g(x) = 12x + 16$ ?
- A. -32 because it is the  $y$ -coordinate of the intersection of the functions
  - B. -16 because it is the  $y$ -coordinate of the intersection of the functions
  - C. -4 because it is the  $x$ -coordinate of the intersection of the functions
  - D. 4 because it is the  $x$ -coordinate of the intersection of the functions

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6. Which inequality accurately represents the graph below?



- A.  $y \geq 4x - 3$   
 B.  $y \leq 4x - 3$   
 C.  $y \geq 4x + 3$   
 D.  $y \leq 4x + 3$
7. The Garden Club bought tulip bulbs for \$0.75. The club spent less than \$96 total. Which can be used to find the number of tulip bulbs ( $n$ ) the club bought?
- A.  $0.75n$   
 B.  $0.75n = 96$   
 C.  $0.75n < 96$   
 D.  $0.75n > 96$
8. Ted bought 2 movie tickets and a bag of popcorn at the movies. He spent \$21. The popcorn cost \$4. Which of these equations can be used to find the cost of each movie ticket,  $m$ ?
- A.  $2m = 21 + 4$   
 B.  $2(m + 4) = 21$   
 C.  $21 = 2 + 4m$   
 D.  $21 = 4 + 2m$

9. Which equation is consistent with the data in the table?

$x$	$y$
2	9
4	5
6	1
8	-3

- A.  $y = x + 7$   
 B.  $x + y = 11$   
 C.  $2x + y = 13$   
 D.  $3x + y = 15$
10. The costs for gas ( $g$ ) and electric ( $e$ ) heating systems in a 1,500-square-foot house are shown in the table below.

Heating Method	Installation Cost	Annual Operating Cost
Gas	\$10,000	\$600
Electric	\$4,000	\$1,200

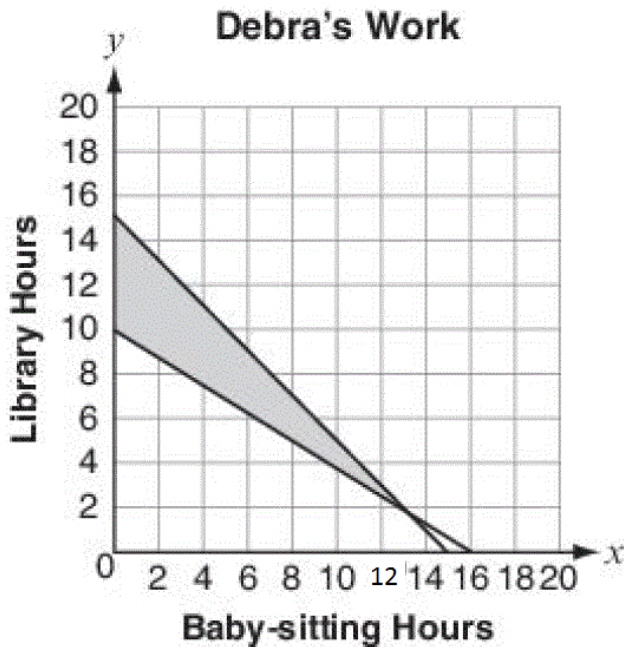
Which set of functions can be used to show the cost of each heating system for a period of  $x$  years?

- A.  $g = 10,000x + 600$   
 $e = 4,000x + 1,200$   
 B.  $g = 600x + 10,000$   
 $e = 1,200x + 4,000$   
 C.  $g = (10,000 + 600)x$   
 $e = (4,000 + 1,200)x$   
 D.  $g = 10,000x + 4,000$   
 $e = 600x + 1,200$

11. Which ordered pair is a solution to the system of inequalities below?

$$\begin{aligned} x &\geq 0 \\ y &> 0 \\ 3x - 4y &\leq 0 \end{aligned}$$

- A. (3, 4)  
 B. (5, 0)  
 C. (7, 2)  
 D. (6, 1)
12. Debra earns \$5 an hour baby-sitting and \$8 an hour working at the local library. Her goal is to earn at least \$80 this week, but she cannot work more than 15 hours. Debra models this situation using the graph below.



- A. 3 hours working at the library and 9 hours babysitting  
 B. 4 hours working at the library and 12 hours babysitting  
 C. 9 hours working at the library and 3 hours babysitting  
 D. 12 hours working at the library and 4 hours babysitting

13. The total cost for a family to attend a play is calculated by using the expression  $3a + 6s$ . In the expression,  $a$  represents the cost of each adult ticket and  $s$  represents the cost of each student ticket. How many adults and students will be attending?

- A. 9 adults and 3 students  
 B. 6 adults and 3 students  
 C. 3 adults and 9 students  
 D. 3 adults and 6 students

14. After the expression below is simplified, what is the coefficient of  $n^2$ ?

$$(n^2 - 3) - (7 - n + 3n^2) - (4n + 1 - 8n^2)$$

- A. -4  
 B. -3  
 C. 3  
 D. 6

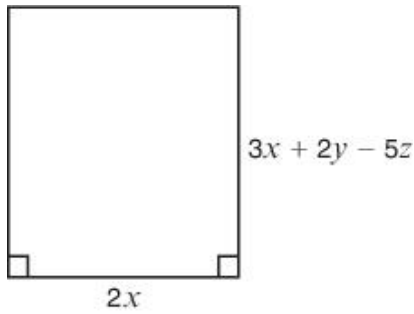
15. The polynomial shown below represents the area of a rectangular tabletop.

$$6x^2 - 7x - 20$$

Which set of factors represents the dimensions of the tabletop?

- A.  $(x - 4)(6x + 5)$   
 B.  $(2x - 2)(3x + 10)$   
 C.  $(3x + 5)(2x - 4)$   
 D.  $(3x + 4)(2x - 5)$

16. This rectangle represents Dan's backyard.



How much fencing will Dan need to enclose his backyard?

- A.  $5x + 2y - 5z$   
 B.  $10x + 4y - 10z$   
 C.  $6x^2 + 4xy - 10xz$   
 D.  $10x^2 + 4y^2 - 10z^2$
17. Function  $f$  is defined by the equation  $f(x) = 24x^2 + 5$ , and function  $g$  is defined as  $g(x) = 24x^2 + 7$ . How are the graphs of function  $f$  and function  $g$  related?
- A. They are both parabolas, but the graph of function  $f$  is wider.  
 B. They are both parabolas, but the graph of function  $g$  is wider.  
 C. They are parabolas of the same size, but function  $g$  is 2 units lower on the grid.  
 D. They are parabolas of the same size, but function  $g$  is 2 units higher on the grid.

18. Gina's table shows the relationship between the number of tomatoes ( $x$ ) she purchased and the total price ( $y$ ) she paid.

Number of Tomatoes ( $x$ )	Price of Tomatoes ( $y$ )
4	\$3.00
6	\$4.50
8	\$6.00
10	\$7.50
12	\$9.00

Which statement describes the relationship?

- A. Each tomato cost \$0.75.  
 B. Each tomato cost \$1.50.  
 C. Each tomato cost \$2.00.  
 D. Each tomato cost \$3.00.
19. Mr. Dawson rides a stationary bike for exercise. One day, he set the odometer to zero miles and rode the bike at a constant speed. The graph shows the time, in minutes, he rode and the reading on the odometer.

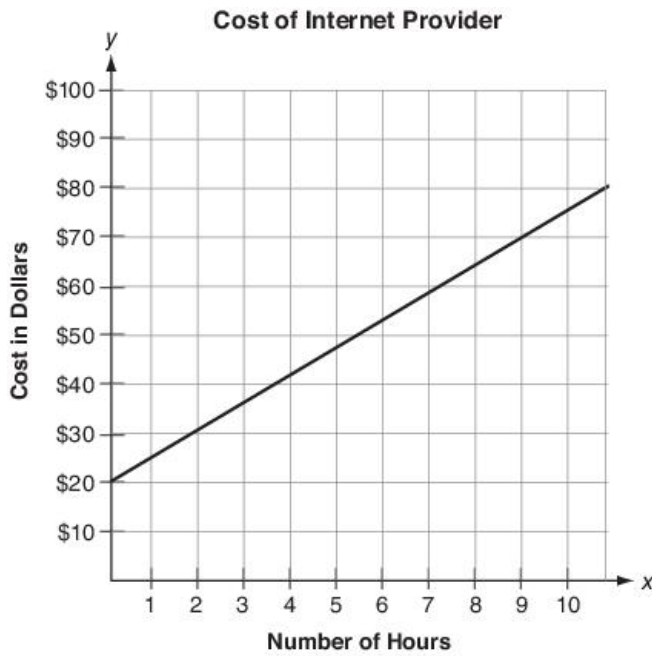


What does the slope of the line BEST represent?

- A. The slope represents the distance Mr. Dawson rode his bike.  
 B. The slope represents Mr. Dawson's riding speed in miles per minute.  
 C. The slope represents the number of hours Mr. Dawson rode his bike.  
 D. The slope represents the number of minutes Mr. Dawson rode his bike.

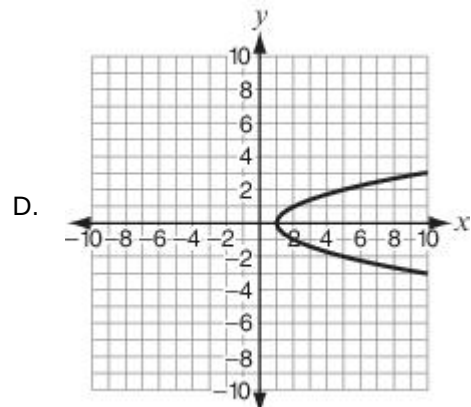
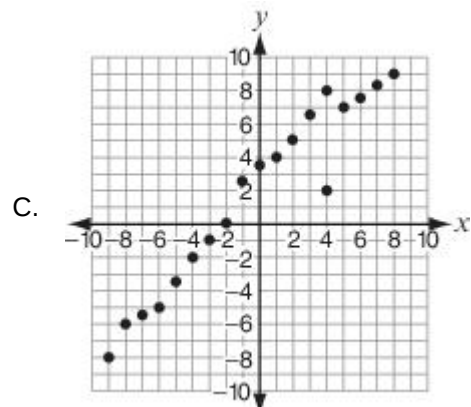
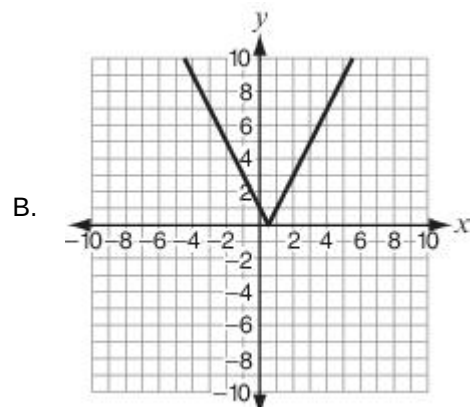
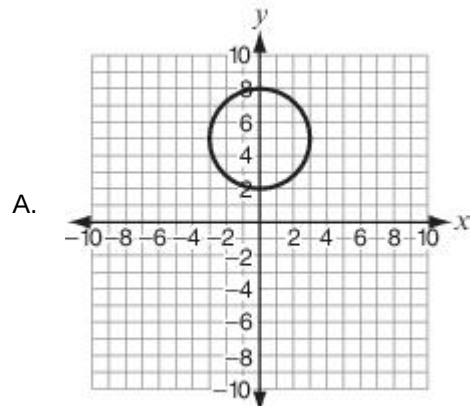
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20. In the graph below,  $x$  represents the number of hours Jason uses the Internet and  $y$  represents the total cost of his Internet provider. Which function best represents this situation?



- A.  $y = 5x$
- B.  $y = 20x$
- C.  $y = 5x + 20$
- D.  $y = 20x + 5$

21. Which graph represents a function?



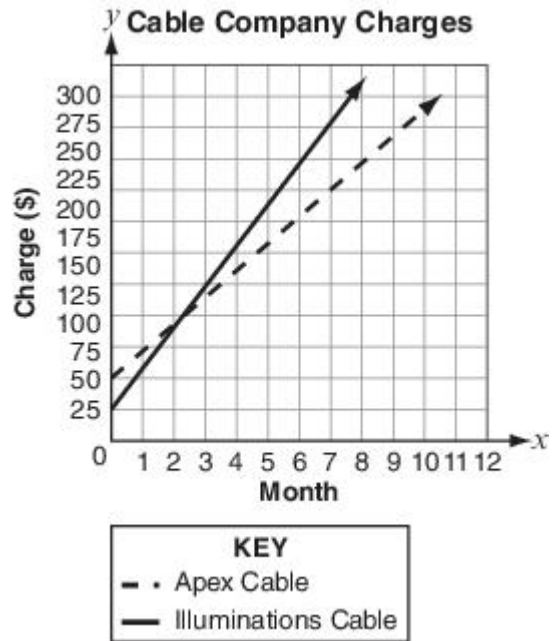
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22. Elizabeth walks 5.25 miles every week. The function  $f(n) = 5.25n$  gives the total number of miles Elizabeth has walked after  $n$  weeks. What is the meaning of the equation  $f(8) = 42$  ?
- During the 8th week, Elizabeth will walk 42 miles.
  - During the 42nd week, Elizabeth will walk 8 miles.
  - After 8 weeks, Elizabeth will have walked 42 miles.
  - After 42 weeks, Elizabeth will have walked 8 miles per week.

23. At a certain time during the year, the equation  $C = -0.04t + 5.0$ , where  $t$  is time in days and  $C$  is temperature in degrees Celsius, can be used to find the average water temperature in a lake. According to this equation, what will be the temperature of the water in the lake in 4 days?
- 3.40°C
  - 4.84°C
  - 5.16°C
  - 10.00°C

24. The domain of the function  $g(x) = x^2 - 5x + 4$  is  $\{0, 3, 7\}$ . What is the range of function  $g$  ?
- $\{-5, -3, 4\}$
  - $\{-2, 4, 18\}$
  - $\{2, 4, 18\}$
  - $\{4, 16, 312\}$

25. Two cable companies each charge a one-time setup fee and a monthly rate for their cable service. The total cost for each company's plan over a period of time is shown below.

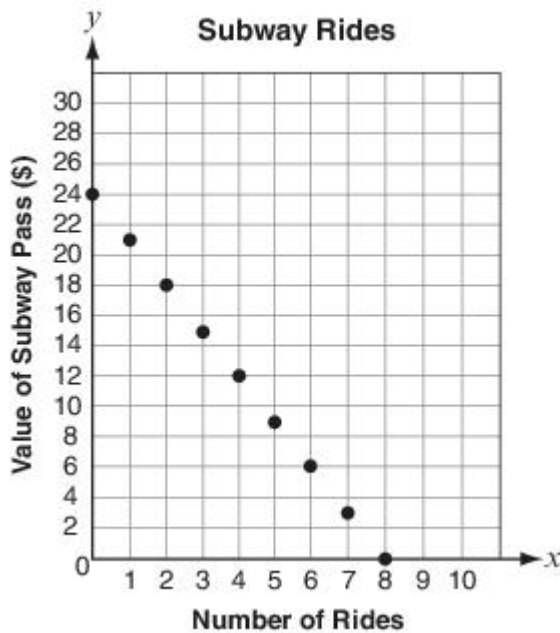


Which statement is true?

- Apex Cable charges a lower setup fee and a lower monthly rate than Illuminations Cable does.
- Apex Cable charges a higher setup fee and a higher monthly rate than Illuminations Cable does.
- Apex Cable charges a lower setup fee but a higher monthly rate than Illuminations Cable does.
- Apex Cable charges a higher setup fee but a lower monthly rate than Illuminations Cable does.



26. Each time Jose rides the subway, \$3 is subtracted from the value of his subway pass. The value of the pass after each ride is shown on the graph.



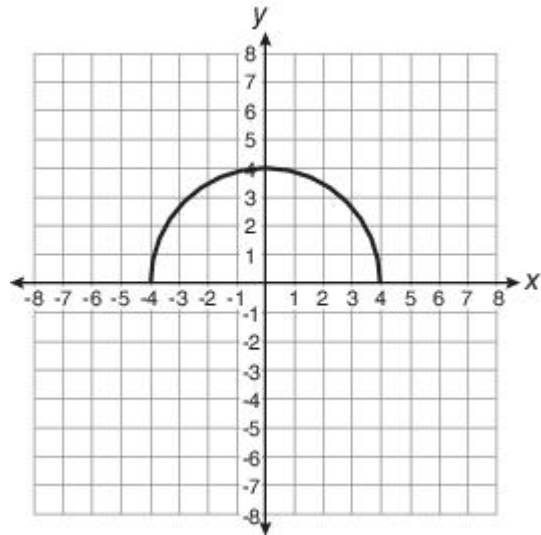
How many times can Jose ride the subway before his pass runs out of money?

- A. 3  
 B. 8  
 C. 10  
 D. 24
27. The following equations are used to model the cost of building a house, where  $y$  is the cost in dollars and  $x$  is the square footage of the house.
- urban zone:  $y = 150x + 18,000$
  - suburban zone:  $y = 180x + 18,000$
  - rural zone:  $y = 125x + 18,000$

Based on this family of equations, which of these statements must be true?

- A. The cost of building a house in any of the three zones is at least \$18,000 .
- B. The cost of building any house in a rural zone is less than the cost of building any house in an urban zone.
- C. Building a 2,000 -square-foot house in a rural zone costs the same as building a 2,000 -square-foot house in a suburban zone.
- D. The cost of building a house is directly proportional to the size of the house.

28. What is the domain of the function graphed below?



- A. all real numbers  
 B. all positive real numbers  
 C. all values of  $x$  such that  $-4 \leq x \leq 4$   
 D. all values of  $y$  such that  $0 \leq y \leq 4$
29. Kanani is building a rectangular dog pen in her backyard with 80 feet of fencing. The pen's area is given by  $A(x) = -x^2 + 40x$ , where  $x$  is the length of fencing measured in feet along one side of the pen. Which inequality represents the domain of this function given the context it represents?
- A.  $0 < x < 40$   
 B.  $0 < x < 80$   
 C.  $0 < A(x) < 40$   
 D.  $0 < A(x) < 400$

30. The table below shows some values of a function,  $f(x)$ .

$x$	$f(x)$
1.0	5.2
1.5	5.0
2.0	6.0
3.0	4.5
5.0	4.2
10.0	5.2

What is the average rate of change of this function over the interval  $[1, 5]$ ?

- A.  $-1.0$   
B.  $-0.43$   
C.  $-0.25$   
D.  $0.0$
31. Gloria works at least 10 hours but no more than 25 hours each week. She earns \$9.00 an hour. Her weekly earnings depend on how many hours she works. What is the range of this function?
- A. from 0 to 25  
B. from 0 to 225  
C. from 10 to 25  
D. from 90 to 225

**Stop! You have finished this exam.**