

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

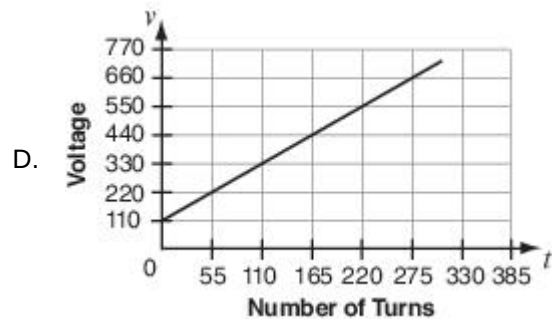
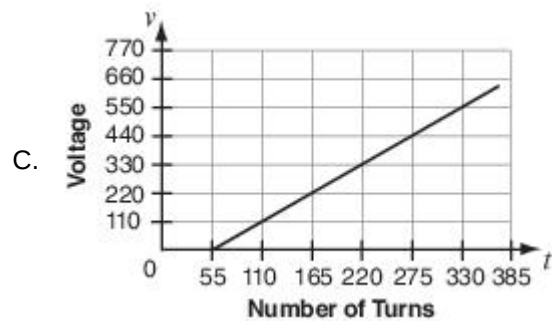
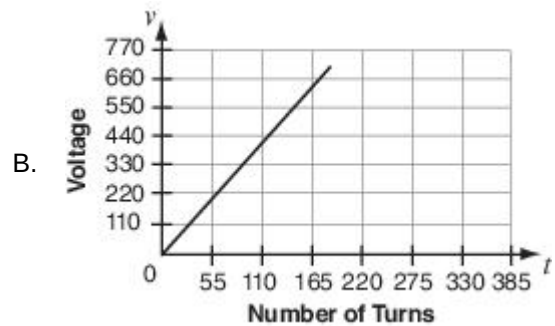
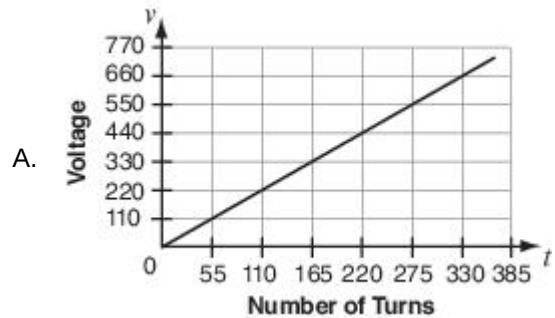
1. Cassie has \$20 in her savings account. She plans to save \$2 per week from her babysitting earnings. Mitch, Cassie's brother, has only \$8 in his savings account but plans to save \$5 a week from his lawn-mowing earnings. How many weeks will it take before the amounts in Cassie's and Mitch's savings accounts are the same?

- A. 2
- B. 4
- C. 10
- D. 28

2. Lilly graphed the line representing the equation  $y = -\frac{1}{2}x + 7$  on a coordinate plane. Which ordered pair would be on this line?

- A.  $(-3, \frac{17}{2})$
- B.  $(-\frac{1}{2}, 7)$
- C. (1, 12)
- D. (7, 0)

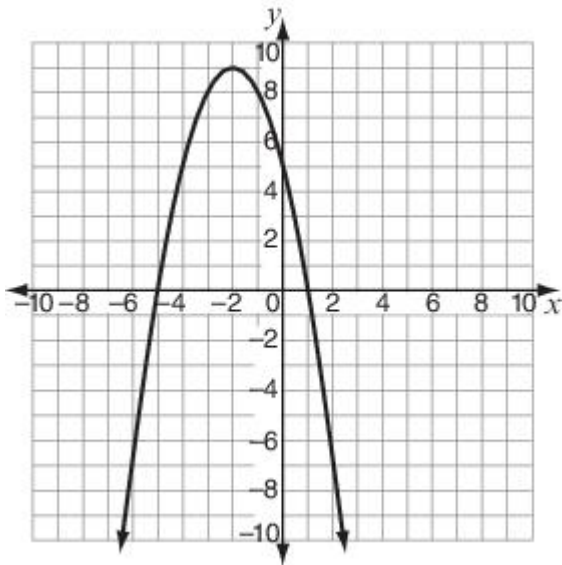
3. The voltage,  $v$ , in an electrical transformer varies directly with the number of turns,  $t$ , on the coil. For every 55 turns, the voltage increases by 110 volts. Which graph models this relationship?



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4. On Saturday, the Burger Shack gave free desserts to the 7th, 11th, 15th, 19th, and 23rd customers, and so on, throughout the day. If  $y$  represents the customer to receive the free dessert and  $x$  represents the number of the dessert to be given away (1st dessert, 2nd dessert, etc.), which rule is the restaurant using?
- $y = x + 2$
  - $y = 2x + 1$
  - $y = 3x + 2$
  - $y = 4x + 3$

5. A quadratic function is graphed below.

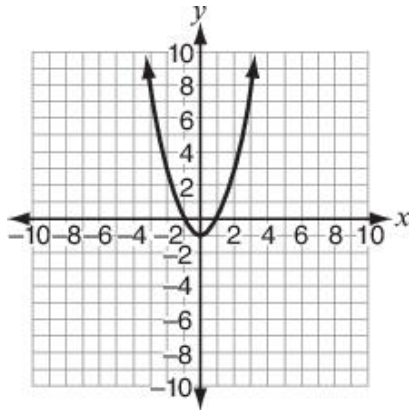


Which quadratic function is represented in this graph?

- $f(x) = x^2 - 2x + 5$
  - $f(x) = x^2 - 4x + 5$
  - $f(x) = -x^2 - 2x + 5$
  - $f(x) = -x^2 - 4x + 5$
6. Which expression contains coefficients that have a sum of 11?
- $2x + 6y$
  - $4x + 7y$
  - $6x - 5y$
  - $10x - y$

7. A rectangular plot of land has an area of  $2x^2 + 5x - 3$  square yards. Which could be the dimensions of the plot of land?
- $(2x - 1)$  by  $(x + 3)$
  - $(2x - 3)$  by  $(x + 1)$
  - $(2x - 1)$  by  $(x - 3)$
  - $(2x + 3)$  by  $(x - 1)$
8. Each shelf of a bookcase holds  $3x + 7$  books. The bookcase has 5 shelves. How many books can the bookcase hold?
- $3x + 12$
  - $3x + 35$
  - $15x + 7$
  - $15x + 35$
9. Which quadratic equation has roots of  $\frac{2}{3}$  and  $-4$  ?
- $(3x + 2)(x - 4) = 0$
  - $(3x - 2)(x + 4) = 0$
  - $(2x - 3)(4x - 1) = 0$
  - $(2x + 3)(-4x + 1) = 0$
10. How many unique  $x$ -intercepts does the graph of the cubic function  $f(x) = -4(x + 5)(x - 1)(x - 1)$  have?
- 0
  - 1
  - 2
  - 3

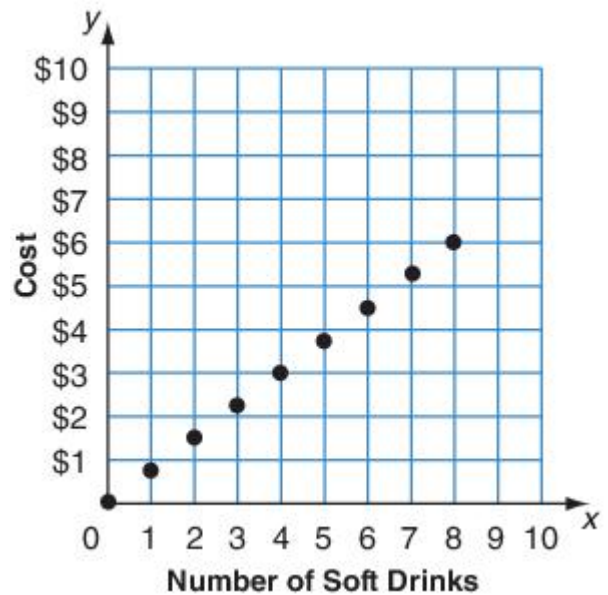
11. Jonah is working with the function  $f(x) = x^2 - 1$ , graphed below.



Which change would produce a function with a parabola that opens down?

- A.  $f(x) + 2$   
 B.  $f(x) - 1$   
 C.  $f(x - 1)$   
 D.  $-f(x)$
12. A medical researcher collected data in order to obtain the correlation between temperature,  $x$ , and the time,  $y$ , it takes, in minutes, for unprotected skin to burn. As a result of this study, the equation  $y = -0.91x + 105$  was found to be the equation for the line of best fit. What does the slope of the line represent?
- A. When the temperature is 91 degrees, the number of minutes it takes for skin to burn is about 105.  
 B. When the temperature is 105 degrees, the number of minutes it takes for skin to burn is about 91.  
 C. For every degree the temperature increases, the number of minutes it takes for skin to burn increases by about 1 minute.  
 D. For every degree the temperature increases, the number of minutes it takes for skin to burn decreases by about 1 minute.

13. This graph shows the total cost of purchasing different numbers of soft drinks at the Monroe High School student store.



Which statement BEST describes the slope of a line joining the points on this graph?

- A. The cost is \$0.75 per day.  
 B. The cost is \$0.75 per soft drink.  
 C. Students consume 8 soft drinks per day.  
 D. Students buy up to 8 soft drinks per day.
14. Mr. Calhoun presents his class with the table of values below.

$x$	1	2	3	4	5
$y$	6.5	9	11.5	14	16.5

As a classroom activity, the students have to write an equation that models the given relationships. Mr. Calhoun receives four different answers from his students. Which equation is correct?

- A.  $y = 0.4x + 6.1$   
 B.  $y = 0.5x + 6$   
 C.  $y = 2x + 4.5$   
 D.  $y = 2.5x + 4$

15. Which table represents a function?

A.

$x$	$y$
4	8
6	9
8	10
8	11
12	11

B.

$x$	$y$
4	8
6	13
8	18
6	25
12	25

C.

$x$	$y$
4	0
4	12
8	14
10	16
12	0

D.

$x$	$y$
4	9
6	13
8	17
10	21
12	25

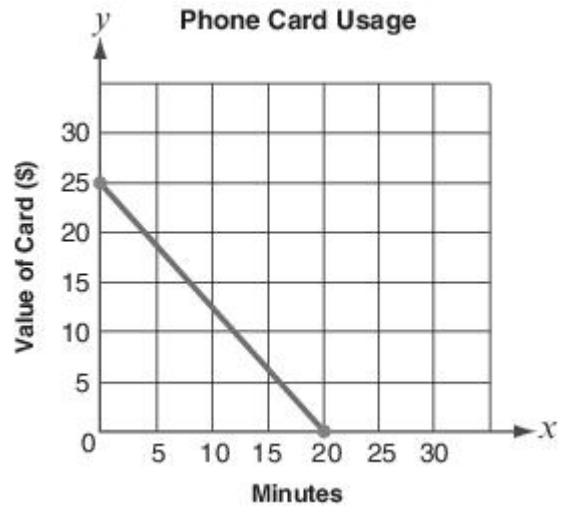
16. Sam threw a ball into the air. The height,  $h$ , in feet, of Sam's ball  $t$  seconds after being thrown is given by this formula:

$$h = -16t^2 + 48t + 8$$

The time the ball reached its maximum height was 1.5 seconds. What was the maximum height of the ball?

- A. 24 feet
- B. 36 feet
- C. 44 feet
- D. 51 feet

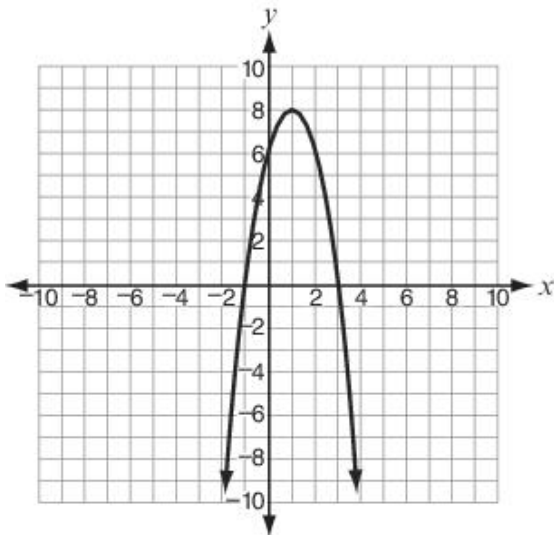
17. Jeannie buys a prepaid phone card. The value of her card after using it for  $x$  minutes is shown in the graph below.



Which of these statements describes the meaning of the x-intercept on this graph?

- A. The value of Jeannie's card before using it is \$20.
- B. Jeannie can talk for only periods of 5 minutes each time.
- C. Jeannie can talk 20 minutes before the value of her card runs out.
- D. Jeannie can talk 25 minutes before the value of her card runs out.

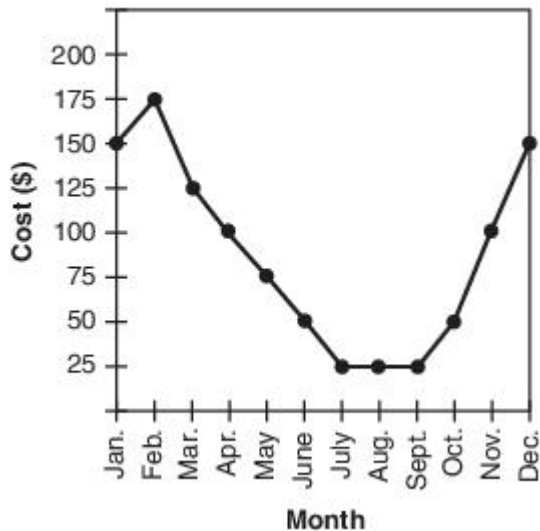
18. What is the domain of the function graphed below?



- A.  $x \leq 8$
- B.  $-1 \leq x \leq 3$
- C.  $8 \leq x \leq -9$
- D. all real numbers

19. The Harris family's heating costs during a one-year period are shown in this graph.

Heating Costs



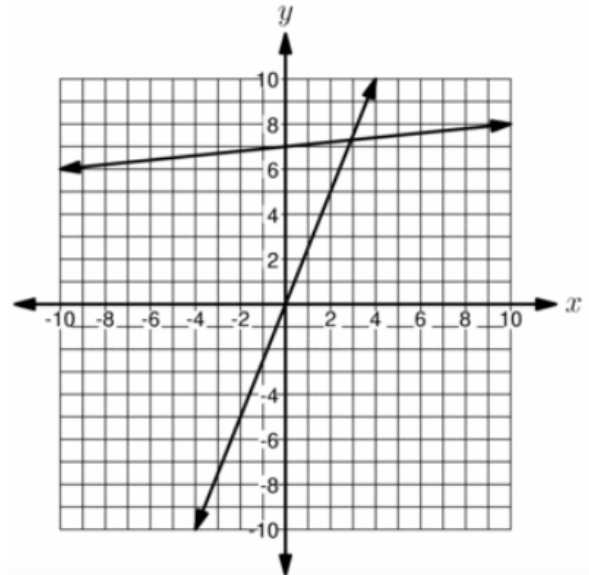
During which interval was the rate of change in heating costs the GREATEST?

- A. January to February
- B. March to June
- C. July to September
- D. October to December

20. What is the solution to the inequality shown below?  
 $7 - 3x > -x + 5$

- A.  $x < 1$
- B.  $x > 1$
- C.  $x < -1$
- D.  $x > -1$

21. Which equation shows a way to find the x-value of the intersection of this graph?



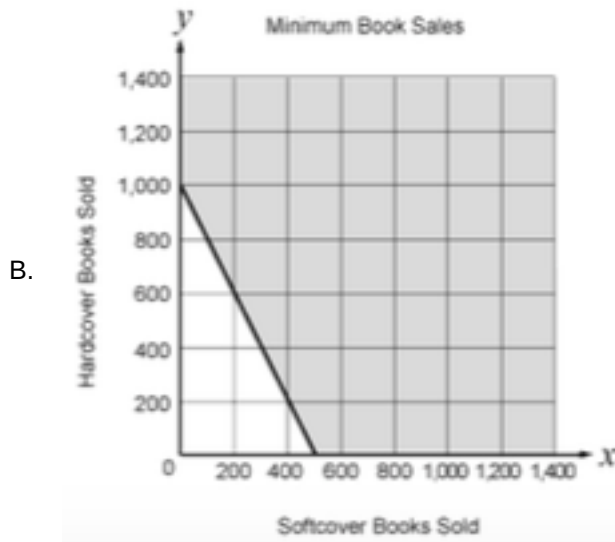
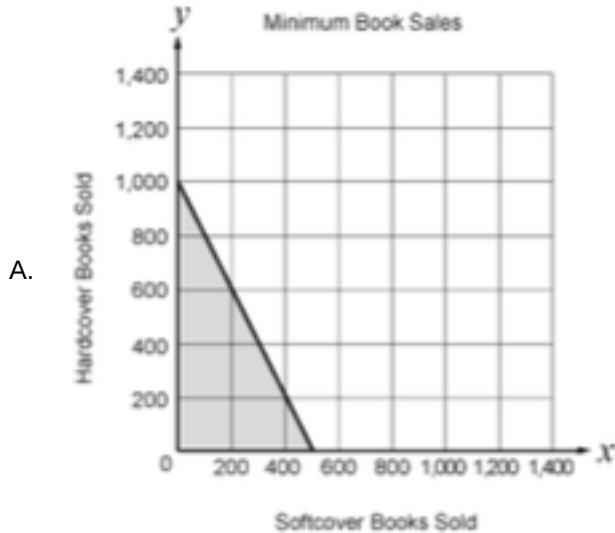
- A.  $0.1x + 7 = 2x$
- B.  $0.2x + 7 = 2x$
- C.  $0.1x + 7 = 2.5x$
- D.  $0.2x + 7 = 2.5x$

22. A book company sells softcover and hardcover books.
- They make a \$5 profit on each softcover book sold.
  - They make a \$10 profit on each hardcover book sold.

The inequality below models the number of softcover books,  $x$ , and hardcover books,  $y$ , that should be sold to make a profit of at least \$5,000.

$$5x + 10y \geq 5,000$$

Which graph shows the solution to this inequality?



23. A city law states that the area,  $x$ , of a new building on a lot must be less than  $\frac{3}{5}$  of the total area,  $y$ , of the lot on which it is built. Which inequality shows this relationship?

- A.  $x < \frac{3}{5}y$
- B.  $y < \frac{3}{5}x$
- C.  $x > \frac{3}{5}y$
- D.  $y > \frac{3}{5}x$

24. Jaden invests in silver and gold. He plans to sell his gold if both of these conditions are met. Let  $G$  be the price per ounce of gold and  $S$  be the price per ounce of silver.

- $G > \$500$
- $10S < G$

Which situation meets both of Jaden's conditions for selling his gold?

- A. Gold costs \$600 per ounce and silver costs \$75 per ounce.
- B. Gold costs \$400 per ounce and silver costs \$35 per ounce.
- C. Gold costs \$600 per ounce and silver costs \$55 per ounce.
- D. Gold costs \$400 per ounce and silver costs \$65 per ounce.

25. A delivery truck takes potatoes and carrots to stores. The total weight of the load, in pounds, can be found using the expression  $50p + 40c$ , where  $p$  is the number of bags of potatoes and  $c$  is the number of boxes of carrots in the load.

What is the meaning of the 50 in the expression?

- A. Each bag of potatoes costs \$50.
- B. The whole load weighs 50 pounds.
- C. Each bag of potatoes weighs 50 pounds.
- D. There are 50 bags of potatoes in a load.

26. DeMarco graphs the function  $f(x) = (x - 6)^2$ . Which sentence best describes how DeMarco's graph compares to the graph of  $f(x) = x^2$ ?

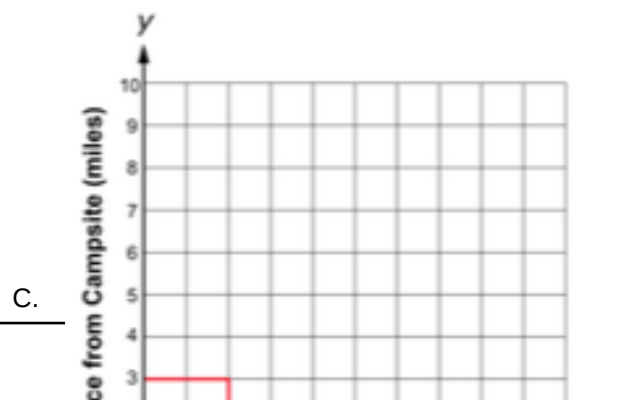
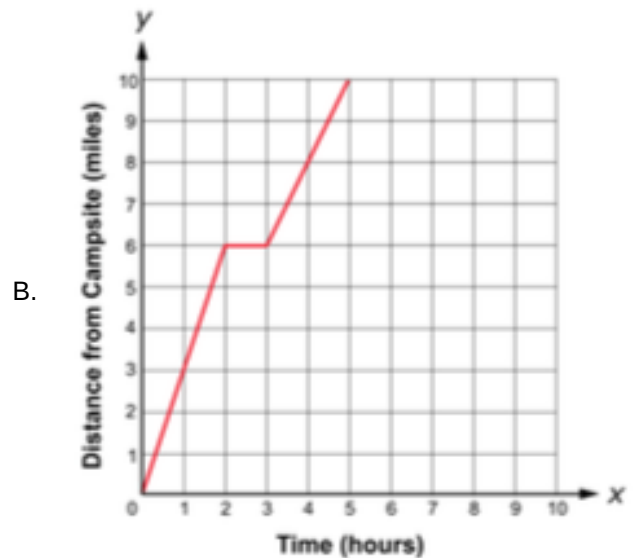
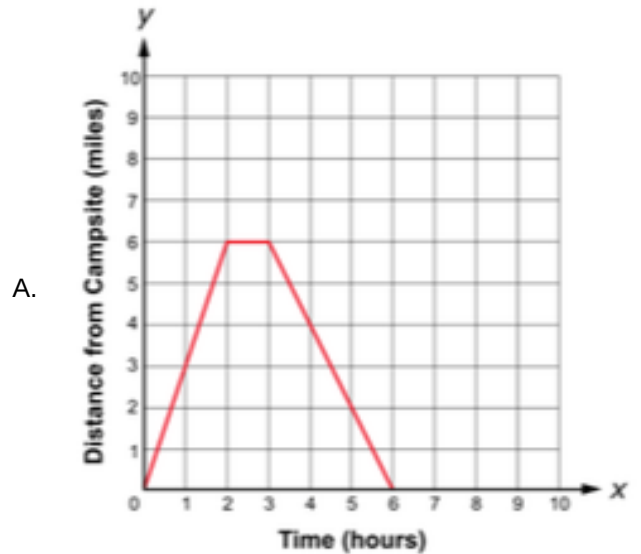
- A. DeMarco's graph is translated 6 units to the right.
- B. DeMarco's graph is translated 6 units to the left.
- C. DeMarco's graph is translated 6 units down.
- D. DeMarco's graph is translated 6 units up.

Go on to the next page »

27. Which of the following coordinates is a point on the graph  $g(x)$ , if  $12 = g(-3)$ ?
- (12, -3)
  - (-3, 12)
  - (3, -12)
  - (-12, -3)
28. A botanist is studying the growth of a species of plant. She writes a function describing the growth of the plant, where  $y$  is the age of the plant in years and  $d(y)$  is the diameter of the plant stem in centimeters. Which statement represents the correct description of  $d(4) = 10$ ?
- When the plant is 4 years old, the diameter is 10 centimeters.
  - When the plant is 10 years old, the diameter is 4 centimeters.
  - Multiply the diameter of the plant by 4 to find the age of the plant.
  - Multiply the age of the plant by 4 to find the diameter of the plant.

29. A camper goes on a hike, starting from his campsite.
- He hikes for 2 hours at a speed of 3 miles per hour.
  - He stops and rests for an hour.
  - He walks back to the campsite at a speed of 2 miles per hour.

Which graph shows the camper's distance from the campsite as a function of time in hours?



30. Ms. Green writes a function  $e(h)$  that can be used to predict the number of eggs that will be laid daily by 1,000 chickens when exposed to  $h$  hours of light per day.

What is the domain of  $e(h)$ ?

- A. the integers from 0 to 24
- B. the integers from 0 to 1,000
- C. the real numbers from 0 to 24
- D. the real numbers from 0 to 1,000

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