Coordinate Algebra EOC (GSE) Quiz Answer Key

Creating Equations - (MGSE9-12.A.CED.2) Graph Equations
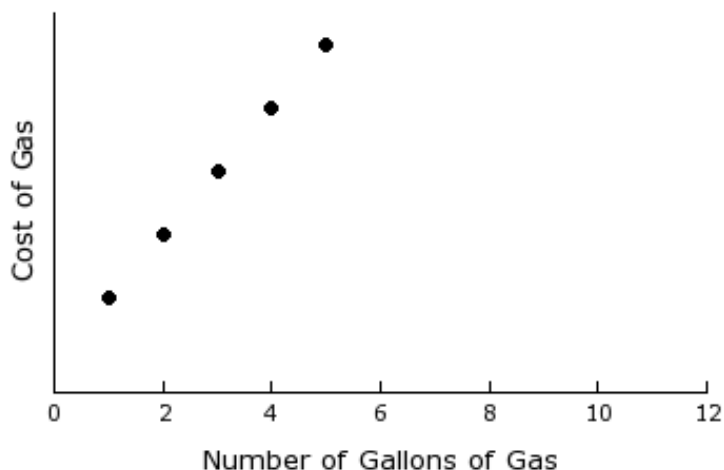
Student Name: _____   Date: _____

Teacher Name: THUYNGA DAO   Score: _____

1)

The graph displays the total cost when buying gas by the gallon. Which statement best describes the relationship between cost and amount of gas purchased?

A) **The more gas you buy, the more it costs.**
B) The less gas you buy, the more it costs.
C) The more gas you buy, the less it costs.
D) The less gas you buy, the less it costs.

Explanation:

Since both the x and y values are increasing the relationship is positive. Therefore the correct statment is **the more gas you buy, the more it costs**

2)
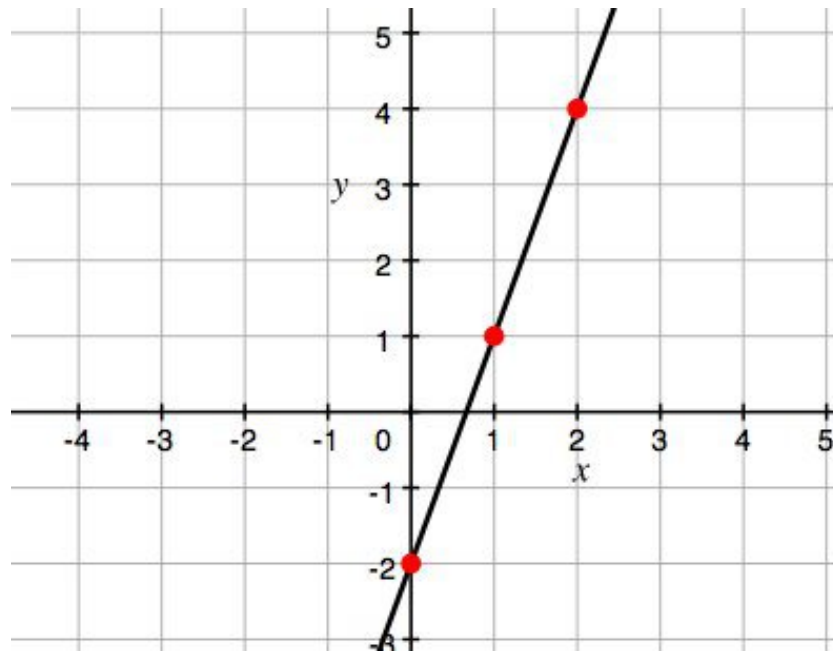
What is the equation of the line graphed?

A)   y = 3x

B)   y = 3x - 2

C)   y = -3x - 2

D)   y = -3x + 2

Explanation:

The slope-intercept form y = mx + b allows us to write equations if the slope and y-intercept are known, m = 3 and b = -2, so the equation of the line is y = 3x - 2.

3)

Sam is 4 times as old as Allie.

Write an equation to model this situation.

A)   S = 4A

B)   A = 4S

C)   S = 4 + A

D)   A = 4 + S

Explanation:

Sam is 4 times as old as Allie can be written as **S = 4A**.

4)

x	y
2	2
3	4
4	6
5	8

Which function corresponds with the table?

A)   f(x) = x + 2
B)   f(x) = 2x - 2
C)   f(x) = -2x + 2
D)   f(x) = -2x - 1

Explanation:
The function that corresponds with the table is **f(x) = 2x - 2**. We can use the slope formula to find the slope **(2)**. After finding the slope we can use any point to form an equation of the line using slope-intercept form.

5)

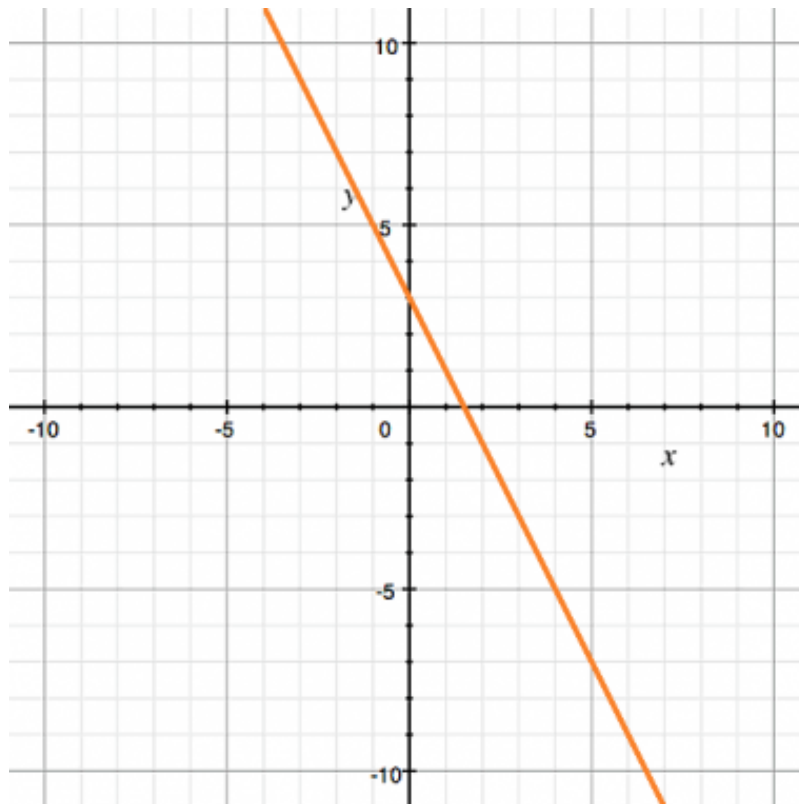| x	y
0	-3
2	5
3	9
4	13

Which equation matches the table?

A)   y = x - 3
B)   y = x + 3
C)   y = 4x - 3
D)   y = 4x + 3

Explanation:
The solution is **y = 4x - 3**. Each y-value in the table is 3 less than 4 times the corresponding x-value.

6)

Identify the equation of the graph shown.
- A)   y = 2x + 3
- B)   y = 2x - 3
- **C)   y = -2x + 3**
- D)   y = -2x - 3

Explanation:
The direction of the graph is decreasing, so the slope is negative. The y-intercept is at (0,3). Therefore, the equation of the graph is **y = -2x + 3.**

7) Allie noticed that to get her test grade, she could take Valerie's grade, multiply it by 2 and subtract 15. If Valerie's test grade was *x*, how would you write Allie's test grade?
- A)   2x
- B)   2x + 15
- **C)   2x - 15**
- D)   15x - 2

Explanation:
Take Valerie's test grade, x, multiply it by two and add 15. Allie test grade is **2x - 15** points.

8)

x	y
0	3
1	1
2	-1

Which equation represents the data in the table shown?

A)   y = -2x
B)   y = 2x + 3
C)   **y = -2x + 3**
D)   y = -2x - 3

Explanation:
The correct answer is **y = -2x + 3**. When you substitute the x values into the equations they work in the equation y = -2x + 3. -2(0) + 3 = 3 -2(1) + 3 = 1 -2(2) + 3 = -1.

9) A high school chorus has $1000 in its school account at the beginning of the year. They are putting on a fall concert to raise money for a trip later in the year. At the concert last year they sold tickets for $10 each. If they sell tickets at the same price the total amount in the chorus account can be represented by the linear function T = 10x + 1000. If they increase the ticket price to $15, how many tickets will they have to sell to have a total of $4000 in the account?

A)   100 tickets
B)   150 tickets
C)   **200 tickets**
D)   250 tickets

Explanation:
The solution is **200 tickets**. With a slope of $15, and $1000 already in the account, the chorus must sell 200 tickets to reach the goal of $4000.

10)

x	y
0	-7
1	-4
2	-1
3	2
4	5

Which equation corresponds to the function described in the table?
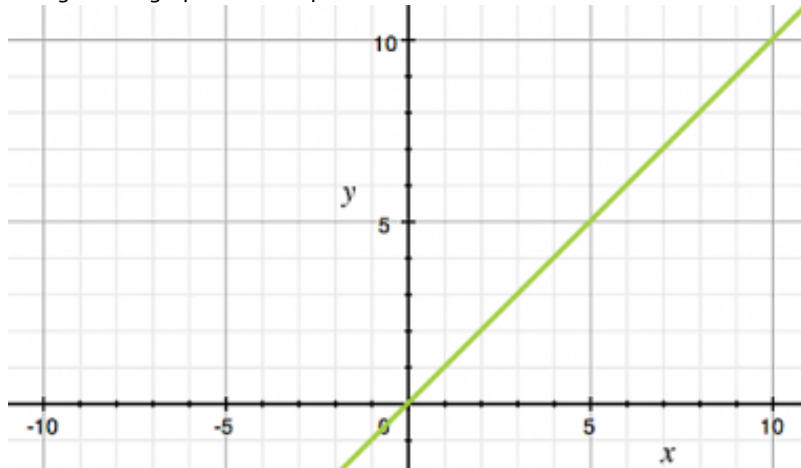
A)   y = x - 7
B)   y = x - 3
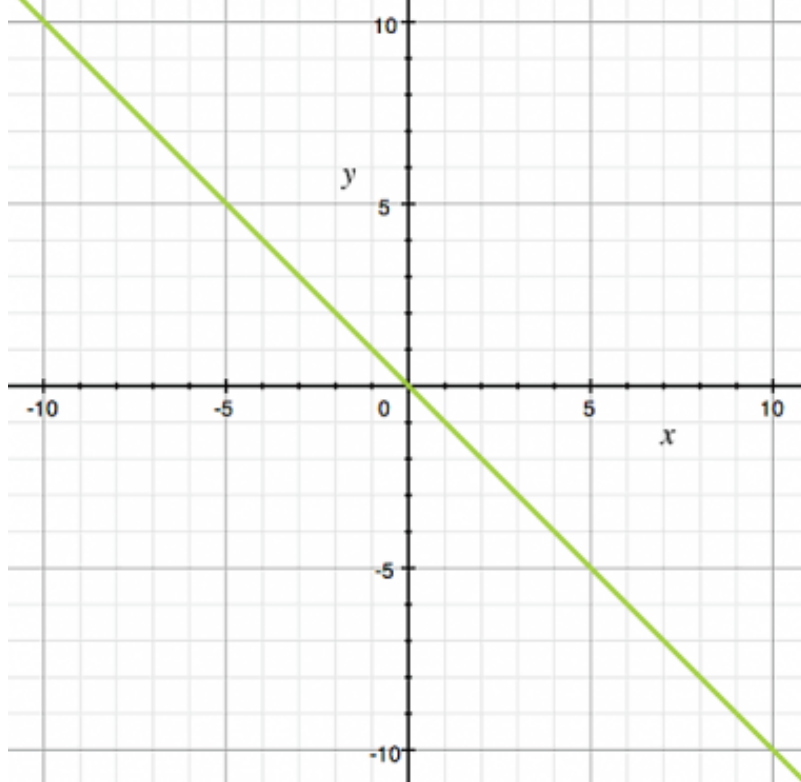C)   y = x - 1
D)   **y = 3x - 7**

Explanation:
The solution is **y = 3x - 7**. Each value in the y-column is 7 less than 3 times the corresponding x-value.

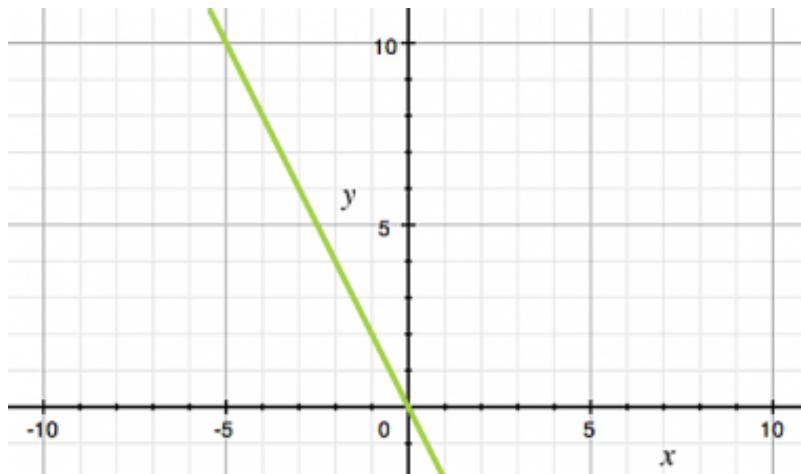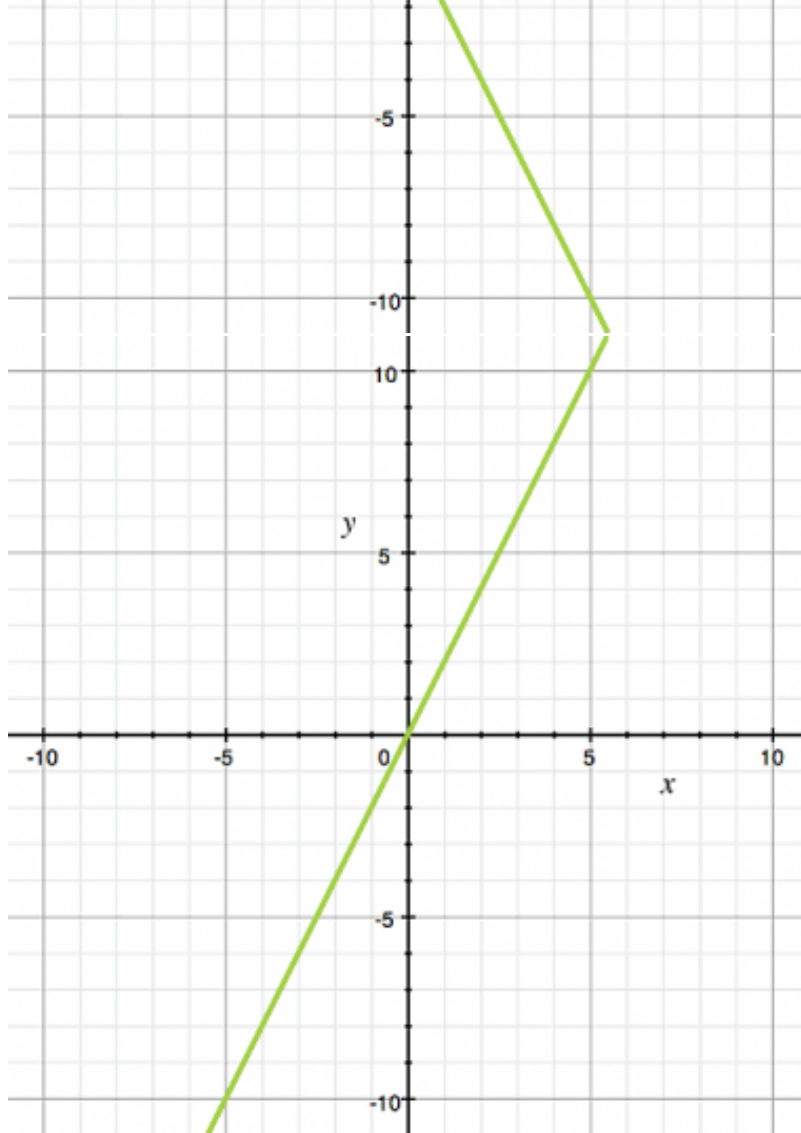**11)** Which straight-line graph has a slope of 1?

A)

B)

C)

D)

Explanation:

A A slope of 1 means that the y coordinate increases by 1 for every unit increase in the x coordinate.

12)

In	Out
5	2
6	4
7	6
8	8
9	10
10	12
11	14

The table shows x-values going in and y-values coming out. The function being used is
  A)   f(x) = 2x
  B)   f(x) = x - 3
  C)   f(x) = x - 8
  D)   f(x) = 2x - 8

Explanation:
y = 2x - 8 is correct. This can be found by testing several x-values to produce the expected y-values.

13)

x	y
0	3
1	1
2	-1

Which function corresponds to the table?
  A)   y = 3x - 2
  B)   y = 2x + 3
  C)   y = -2x + 3
  D)   y = -3x + 2

Explanation:
The line that corresponds with the table is **y= -2x + 3**. We can use the slope formula to find the slope **(-2)**. After finding the slope we can use the the point (0,3) to form an equation of the line using slope-intercept form.

14) Martha is covering kitchen shelves with shelving paper. She has 6 shelves that are each $1\frac{3}{4}$ feet long. She buys $13\frac{1}{4}$ feet of shelving paper of the correct width. Which equation can be used to determine how much paper she will have left over?

A) $6(13\frac{1}{4}) = S$

B) $13\frac{1}{4} + 1\frac{3}{4} - 6 = S$

C) $13\frac{1}{4} - 6(1\frac{3}{4}) = S$

D) $13\frac{1}{4}(6) + 1\frac{3}{4} = S$

Explanation:
The correct expression is **$13\,^1/_4 - 6(1\,^3/_4) = S$**. You must take the total amount you have and subtract how much you need, 6 shelves each $1\,^3/_4$ feet long.

15)

A)

B)

C)

D)
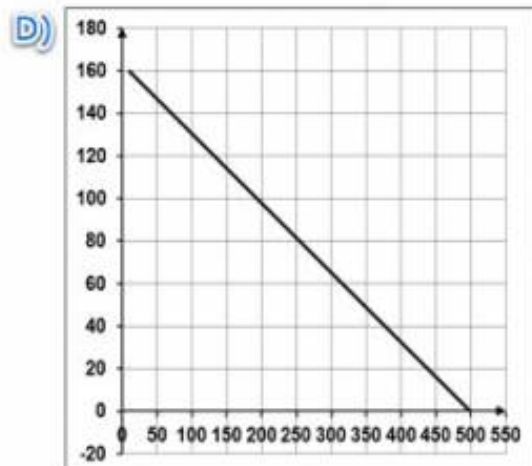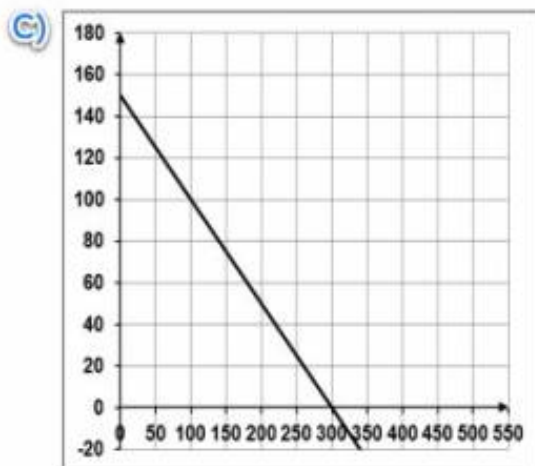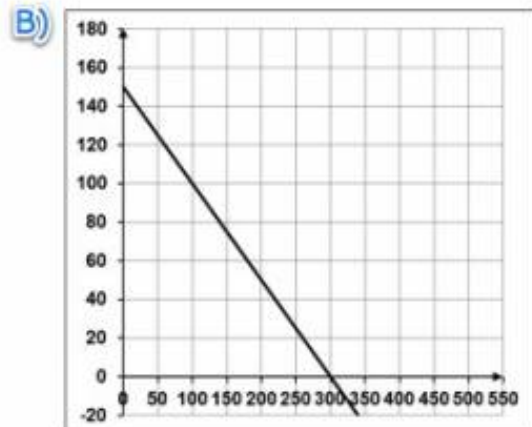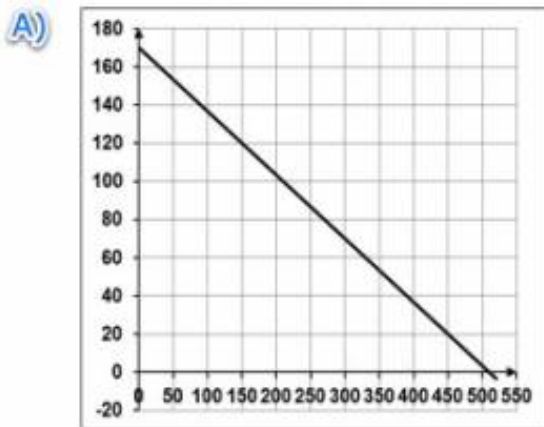
> The straight line profile of a ski hill is plotted on the coordinate plane. The coordinates (500, 0) and (0, 160) lie on the line.

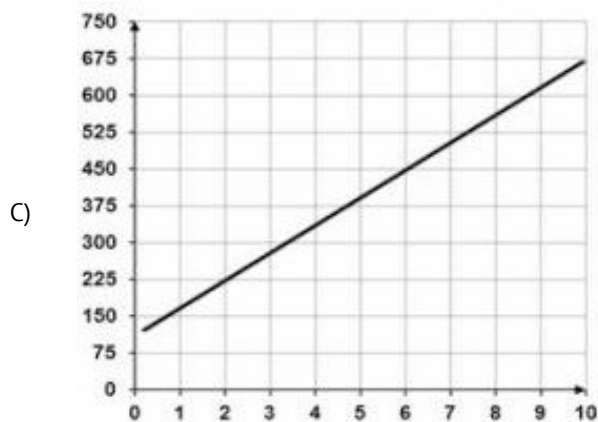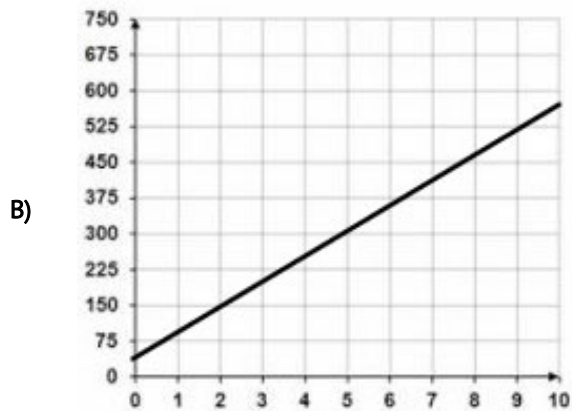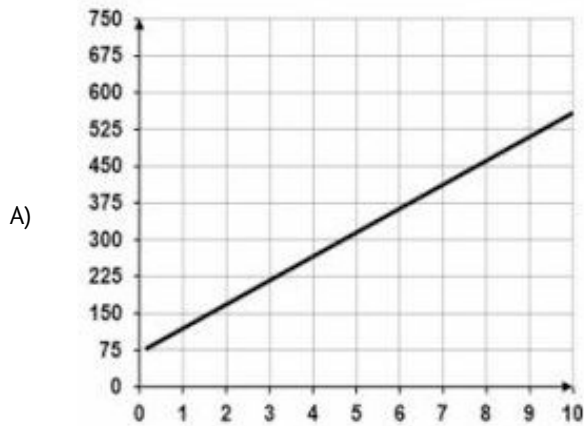SEPARATE GRAPHS Which graph represents the profile of the ski hill?
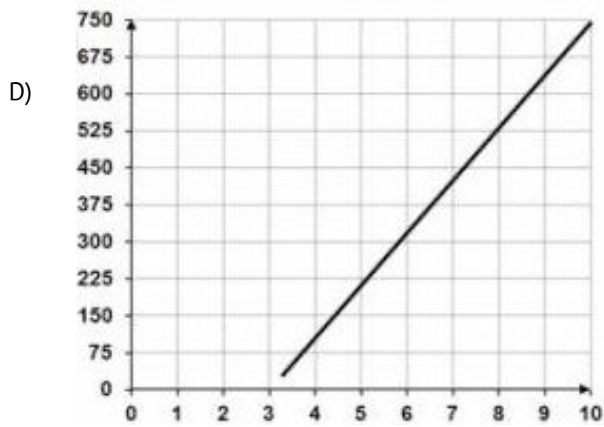
A)

B)
C)
D)

Explanation:
D The point (0, 160) lies on the y-axis and the point (500, 0) lies on the x-axis.

16)

The path of an airplane taking off is modeled by a linear equation. The slope of the line is 50, and (2, 150) is a point on the line.
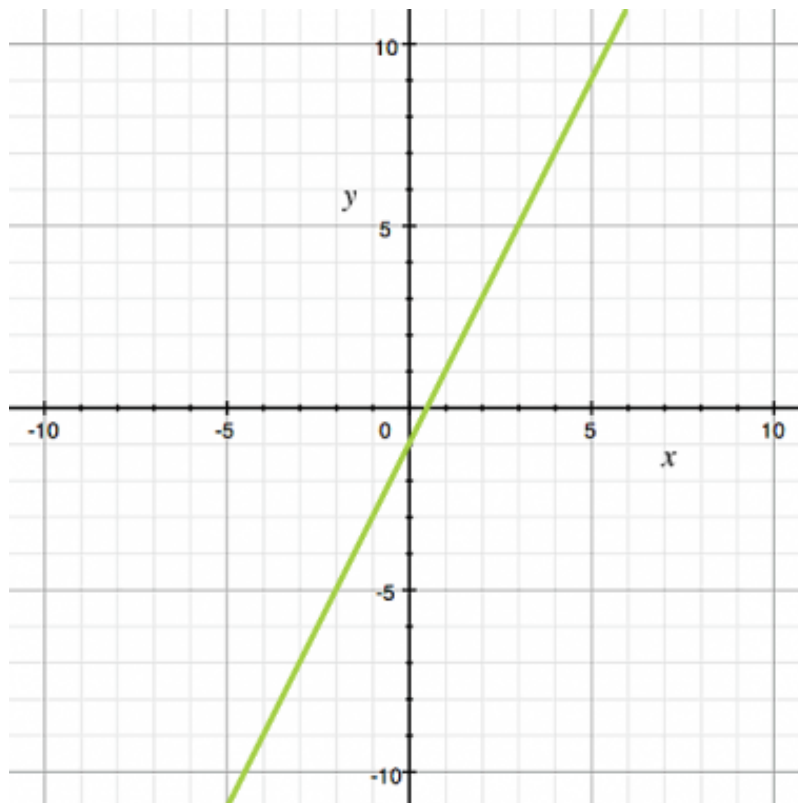
Which graph represents the path of the airplane?

A)

B)

C)

D)

Explanation:

B The point (2, 150) lies on the graph. Choose another point on the line, say (5,300) to calculate the slope:

$$\text{Slope} = \frac{\text{rise}}{\text{run}} = \frac{300 - 150}{5 - 2} = 50$$

17)

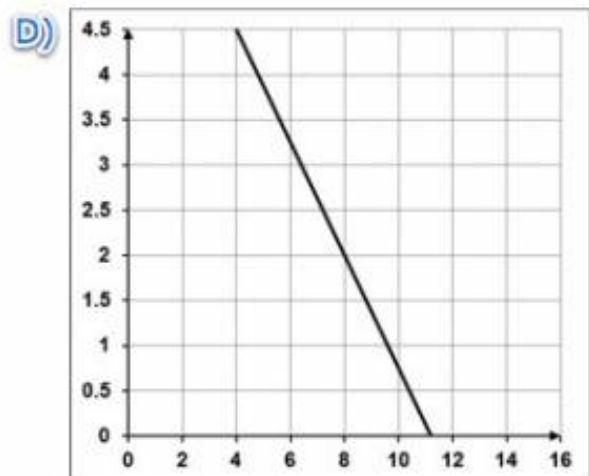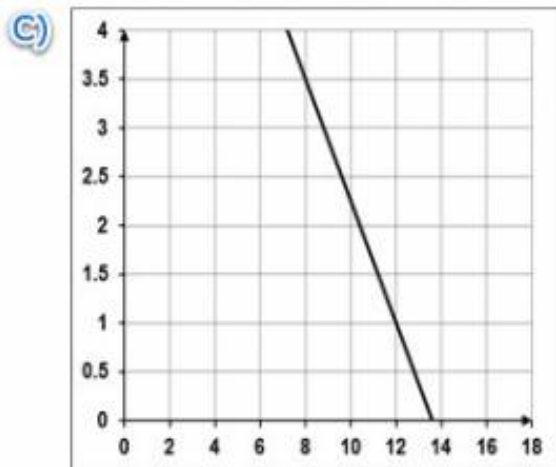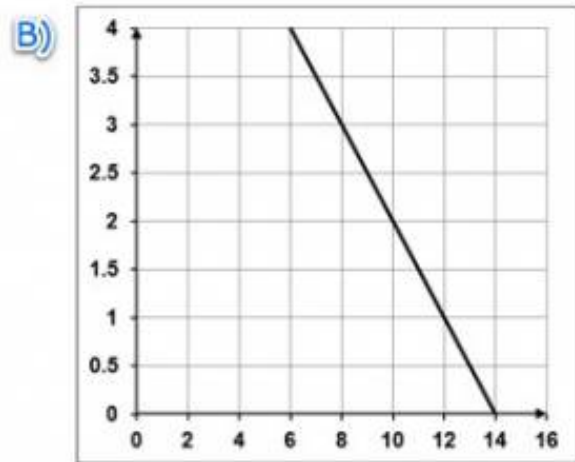The function shown in the graph is

    A)   f(x) = x - 1

    B)   **f(x) = 2x - 1**

    C)   f(x) = x - 0.5

    D)   f(x) = 2x - 0.5

Explanation:

f(x) = 2x - 1 is correct, since it is the only choice which produces y = -1 when x = 0 AND y = 0 when x = 0.5.

18)
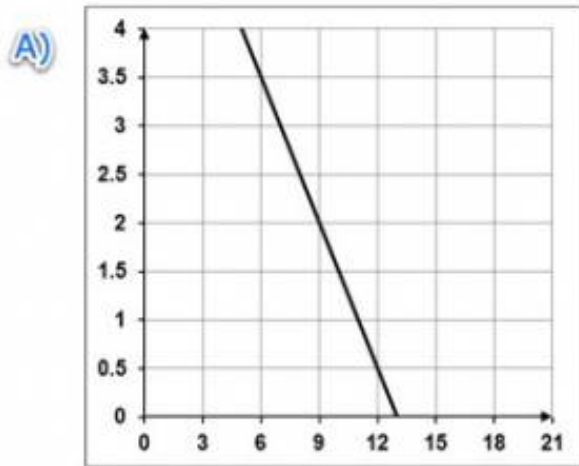
A straight railway track passes through the coordinates (8, 3) and (12, 1).

Which graph shows the path of the railway track?
  A)
  B)
  C)
  D)

Explanation:
B The grid points (8, 3) and (12, 1) lie on the line.

19) Jana blows up the same number of balloons as Jeremy, places half of them in the living room, and ties the rest to the mailbox.

Jeremy places some of his balloons in the kitchen and the rest in the dining room.

Which equation represents how many balloons were placed in each location?
  A)   2 + 6 = 5 + 4
  B)   3 + 5 = 6 + 3
  C)   3 + 4 = 1 + 7
  D)   4 + 4 = 3 + 5

Explanation:
The correct answer is **4 + 4 = 3 + 5**. Since Jana split hers in half, 4 + 4 is right.

20)

Total Cars in Parking Garage
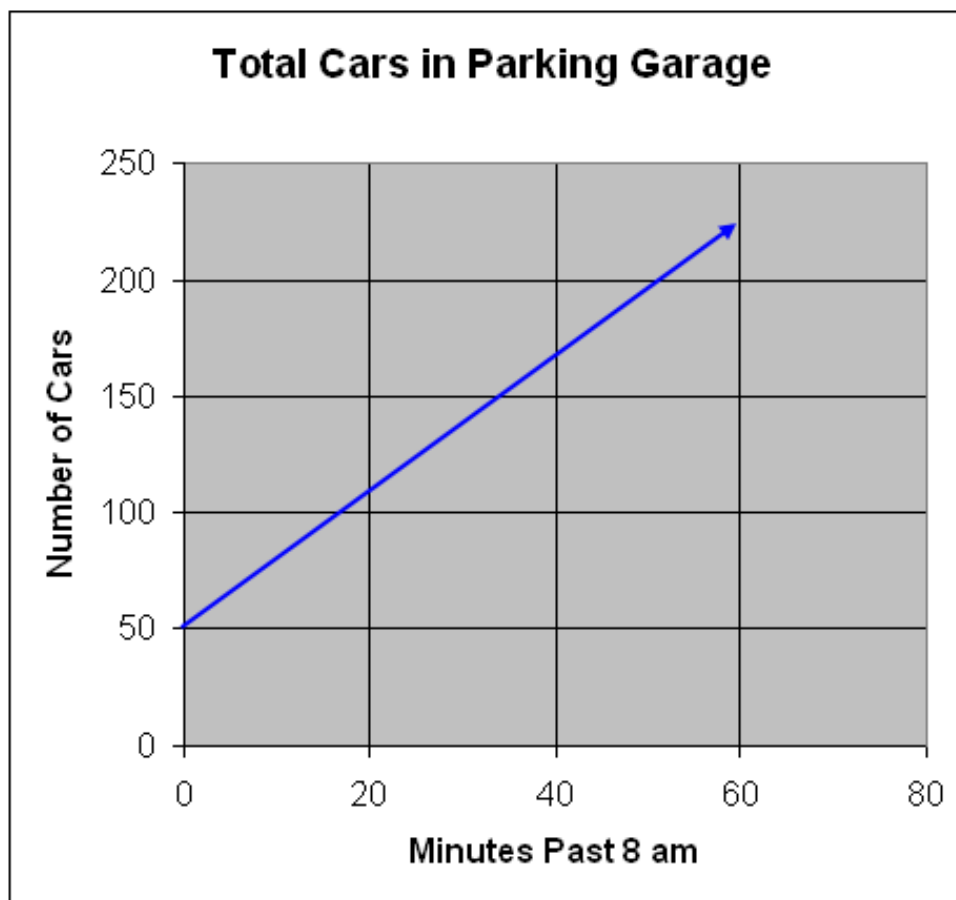
Which equation is modeled by the graph? What is the estimated change in the number of cars in the parking garage for each minute after 8 a.m.?

A)   y = 3x + 50; 3 cars per minute
B)   y = 4x + 50; 4 cars per minute
C)   y = 3x - 50; 3 cars per minute
D)   y = -3x + 50; -3 cars per minute

Explanation:
y = 3x + 50

Substitute the y-intercept (0, 50) and an estimated point (40, 170) into the slope formula and simplify.

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{170 - 50}{40 - 0}$$

$$m = 3$$

Substitute slope and y-intercept into slope- intercept form.

y = mx + b
y = 3x + 50

The slope represents the change in the number of cars in the parking garage per minute, which is 3.

21) The length of a rectangle is represented by x and the width by y. The square of the diagonal of the rectangle is equal to the sum of the squares of the length and the width. If the diagonal is 75 meters, which quadratic equation models this relationship?

A) $x^2 + y^2 = 75$

B) $x^2 + y^2 = 75^2$

C) $x^2 - y^2 = 75^2$

D) $(x + y)^2 = 75^2$

Explanation:
$x^2 + y^2 = 75^2$

The square of the length: x^2.
The square of the width: y^2.
The sum of the square of the length and the square of the width: $x^2 + y^2$
The sum of the square of the length and the square of the width equals the square of the diagonal: $x^2 + y^2 = 75^2$

22) The length of rectangle is represented by x and the width by y. The square of the diagonal of the rectangle is equal to the sum of the squares of the length and the width. If the length is 25 meters and the diagonal is 45 meters, which quadratic equation could be used to determine the width of the rectangle?

A) $45^2 + x^2 = y^2$

B) $25^2 + y^2 = 45^2$

C) $x^2 + 25^2 = 45^2$

D) $(25 + y)^2 = 45^2$

Explanation:
$25^2 + y^2 = 45^2$

The square of the length: 25^2.
The square of the width: y^2.
The sum of the square of the length and the square of the width: $25^2 + y^2$
The sum of the square of the length and the square of the width equals the square of the diagonal: $25^2 + y^2 = (45)^2$

23) A parabola with vertex (h, k) and a vertical axis of symmetry is modeled by the equation $y - k = a(x - h)^2$. Determine the vertex for a parabola modeled by $y - 4 = \frac{1}{2}(x + 1)^2$.

A) (1, 4)

B) (−1, 4)

C) (1, −4)

D) (−1, −4)

Explanation:
(−1, 4)
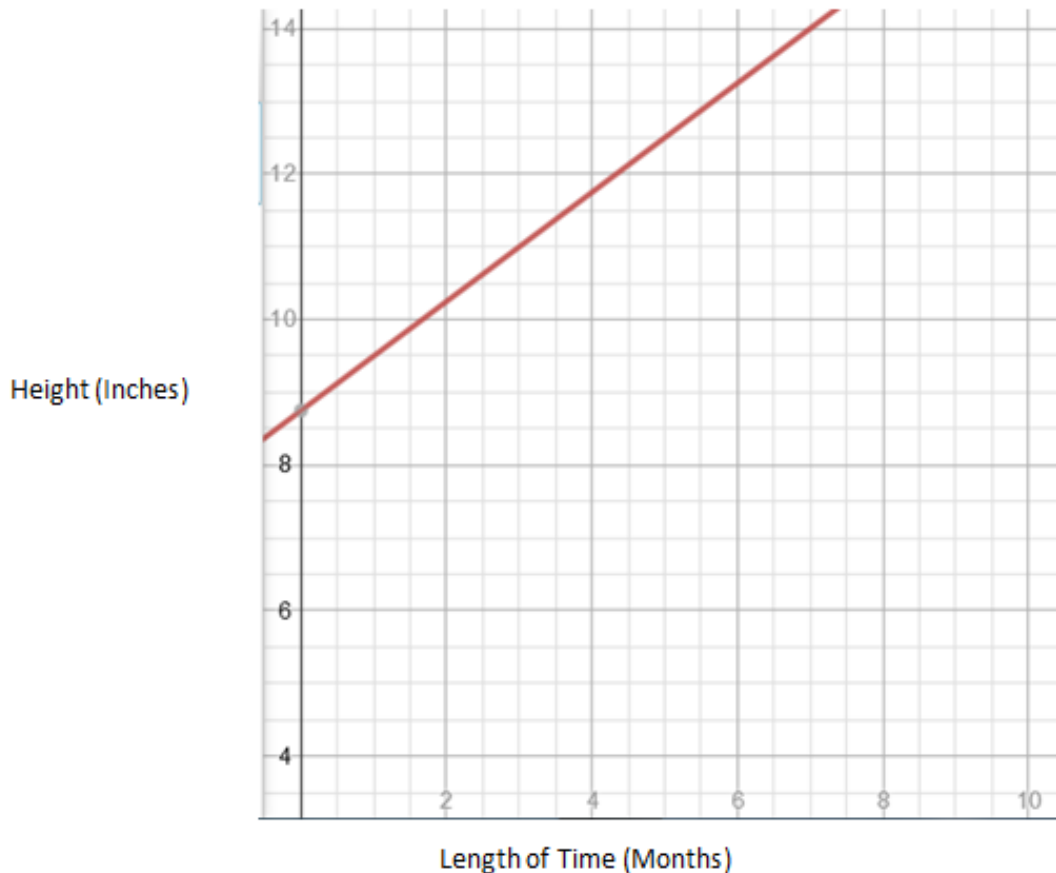
$y - k = a(x - h)^2$

$y - 4 = \frac{1}{2}(x + 1)^2$

$y = \frac{1}{2}(x + 1)^2 + k$

The correct answer is h = −1 and k = 4.

24)

Ashley is keeping track of the growth of a bamboo plant. When she purchased the plant last month its height was 8.75 inches. Its height today is 9.5 inches. Assuming that the growth rate remains unchanged, which equation models the height of the bamboo plant after x months of growth? Using the graph, estimate the height of the plant in 6 months.

    A)   y = .75x; about 11 inches
    B)   y = x + 9.5; about 15 inches
    C)   y = 8.75x; about 52.5 inches
    D)   y = .75x + 8.75; about 13.25 inches

Explanation:
y = .75x + 8.75;about 13.25 inches

Find the amount of growth during first month:
9.5 - 8.75 = .75 inches

The rate of change which is the slope of the line is .75 per month.

The y-intercept is 8.75. When Ashley started tracking the growth last month, its height was 8.75 inches and x = 0 months.

Write the equation in y - intercept form:
y = .75x + 8.75

To find the estimated height of the plant after 6 months, move right on the x axis to 6 and move up to find the y-value which is about 13.25 inches.

25) A parabola with vertex (h, k) and a vertical axis of symmetry is modeled by the equation $y - k = a(x - h)^2$. Determine the vertex for a parabola modeled by $y = (x - 5)^2 + 8$

    A)   (5, 8)

B)   (−5, 8)
C)   (5, −8)
D)   (−5, −8)

Explanation:
(5, 8)

$y - k = a(x - h)^2$
$y - k = (x - 5)^2 + 8$

h = 5 and k = 8
The correct answer is **(5, 8)**.

26) A parabola with vertex (h, k) and a vertical axis of symmetry is modeled by the equation $y - k = a(x - h)^2$. The equation for the axis of symmetry for the parabola is x = h. Determine the equation for the axis of symmetry for a parabola modeled by $y - 4 = \frac{1}{2}(x + 1)^2$.

A)   x = 4
B)   x = 1
C)   x = −1
D)   x = −4

Explanation:
x = −1
$y - k = a(x - h)^2$
$y - 4 = \frac{1}{2}(x + 1)^2.$

The equation for the axis of symmetry is x = h. In the given equation h has a value of − 1; therefore, the correct answer is **x = −1**.

27) The equation for a circle with center (h, k) is $(x - h)^2 + (y - k)^2 = r^2$. If a circle is modeled by the equation $(x - 4)^2 + (y + 6)^2 = 49$, what is the center of the circle?

    A)   (4, 6)

    B)   (4, −6)
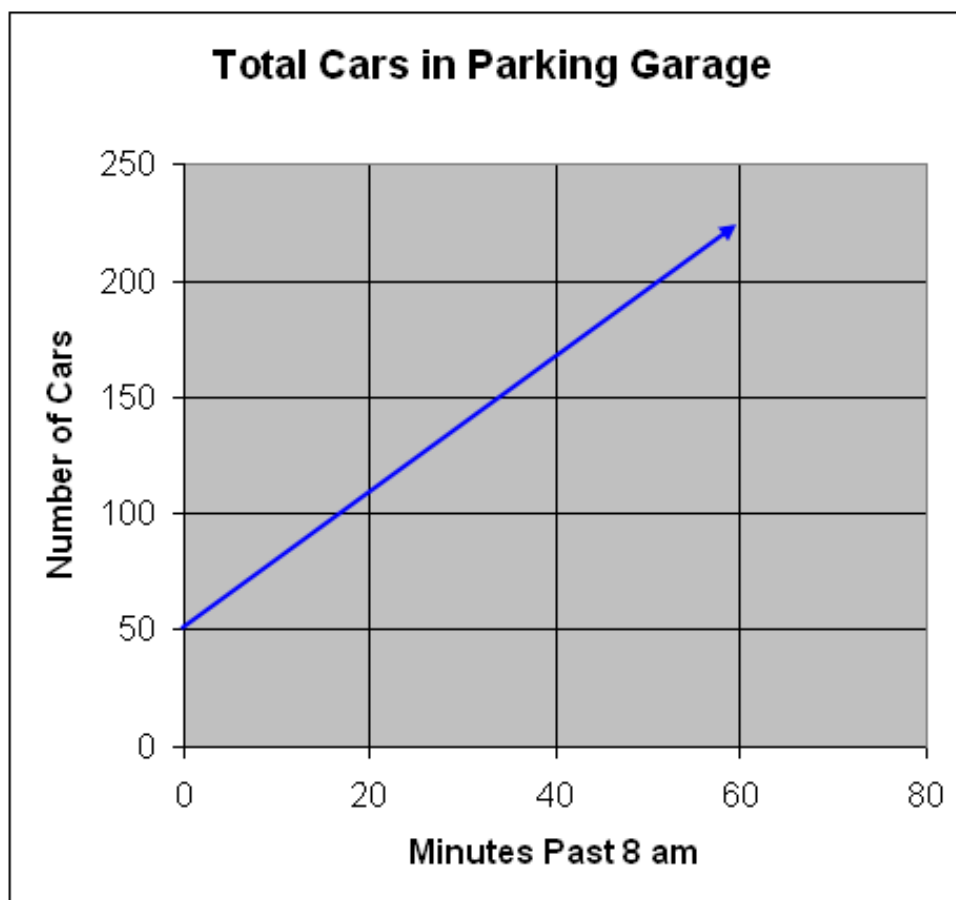
    C)   (−4, 6)

    D)   (−4, −6)

Explanation:

(4, −6)

$(x - h)^2 + (y - k)^2 = r^2$

$(x - 4)^2 + (y + 6)^2 = 49$

(h, k) = **(4, −6)**

28)

Which equation is modeled by the graph? Using the equation, about how many more cars are in the deck at 9:00 a.m. than at 8:30 a.m.?

    A)   y = 3x + 50; 90 cars

    B)   y = 4x + 50; 75 cars

    C)   y = x + 50; 100 cars

    D)   y = 3x - 50; 120 cars

Explanation:

y = 3x + 50

Substitute the y-intercept (0, 50) and an estimated point (40, 170) into the slope formula and simplify.

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{170 - 50}{40 - 0}$$

$m = 3$

Substitute slope and y-intercept into slope- intercept form.

y = mx + b
y = 3x + 50

The slope represents the change in the number of cars in the parking garage per minute, which is 3.

To find the number of cars in the parking garage at 8:30 a.m., substitute 30 into the equation for x (number of minutes after 8:00 a.m.) and simplify:
y = 30(3) + 50 = 140

To find the number of cars in the parking garage at 9:00 a.m., substitute 60 into the equation for x (number of minutes after 8:00 a.m.) and simplify:
y = 60(3) + 50 = 230

Find the difference: 230 - 140 = 90 cars

29) The equation for a circle with center (h, k) is $(x - h)^2 + (y - k)^2 = r^2$. If a circle is modeled by the equation $x^2 + (y + 6)^2 = 100$, what is the center of the circle?

- A)   (0, 6)
- B)   (6, 0)
- **C)   (0, −6)**
- D)   (−6, 0)

Explanation:
(0, −6)
$(x - h)^2 + (y - k)^2 = r^2$
$x^2 + (y + 6)^2 = 100$
Rewrite as $(x - 0)^2 + (y + 6)^2 = 100$
The value for h is 0. The value for k is −6.

30)

Boiling Point:
100°C
212°F

Freezing Point:
0°C
32°F

Which formula could be used to convert degrees Celsius to degrees Fahrenheit?

- A)   F = 2C + 12
- B) $F = \dfrac{5}{9}C + 32$
- **C) $F = \dfrac{9}{5}C + 32$**
- D) $F = \dfrac{1}{2}C + 162$

Explanation:
Plug (100, 212) and (0,32) in for (C, F) in the equations to see which one satisfies both points. The only equation that satisfies both is $F = \dfrac{9}{5}C + 32$.