

Algebra I STAAR Practice Test A

- 1 What is the value of x if $(x, 4)$ is a solution to the equation $3x + 2y = 14$? *x, y tells us y=4*
- (A) 2 C 4 $3x + 2(4) = 14$
 B 3 D 5 $3x + 8 = 14$
 $3x = 6$
 $x = 2$

- 2 In the equation $y = x^2 + 2x + 5$, what is the value for y when x equals 3?

Record your answer and fill in the bubbles on your answer document.

$$y = 3^2 + 2(3) + 5$$

$$= 9 + 6 + 5$$

$$y = 20$$

- 3 Which function best describes the data in the chart below?

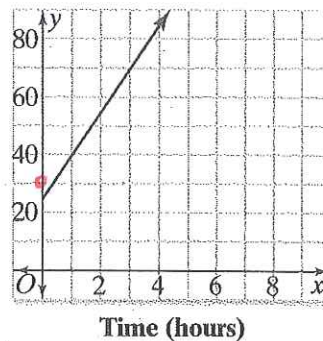
x	1	3	5	7
y	4	8	12	16

- A $y = 4x$
 B $y = 4x + 1$
 C $y = 2x$
 (D) $y = 2x + 2$
- Type equations into "y=" & see which table matches*

- 4 Sam mows lawns in the summer. His net profit for the summer, p , is represented by the equation $p = 15m - 250$, where m is the number of lawns he mows. Which is the best interpretation of this information?

- F Sam made a profit of \$235.
 G Sam made a profit of \$250.
 H Sam earns \$250 per lawn mowed.
 (J) It cost Sam \$250 to get his lawn mowing business started.
- can't find p without m*
He earns \$15 per lawn

- 5 A plumber charges \$25 for a service call and \$15 per hour for repairs. She uses the graph below to help determine her costs for repairs that take varying amounts of time.



After one year, she decides to increase her initial service fee to \$30. She needs to update her graph. Which statement about her graph will be true?

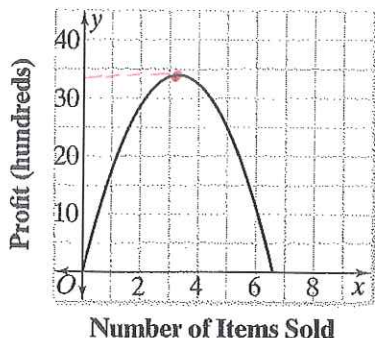
- A The slope will be steeper.
 B The slope will be less steep.
 (C) The y -intercept will move away from the origin. $\rightarrow (0, 0)$
 D The y -intercept will move toward the origin.

- 6 A dance studio charges \$35 per month plus an annual \$10 registration fee. Which equation represents the total cost, c , of the class for m months?

- F $c = 35m - 10$
 (G) $c = 35m + 10$
 H $m = 35c - 10$
 J $m = 35c + 10$



- 7 The quadratic function below models the profit a company makes based on the quantity of items it sells to customers.



What is the greatest profit the company can make based on the sale these items?

- A \$3.50 C \$34
 B \$8 D \$40
- 8 Tickets to a school soccer game are \$3 for adults and \$2 for students. The equation $3x + 2y = 2050$ models the number of students at the game when \$2,050 was taken in from ticket sales. What does the slope of $\frac{3}{2}$ mean in this situation?
- F The ratio of the number of adults at the game to the number of students at the game.
 G The ratio of the number of students at the game to the number of adults at the game.
 H The ratio of the cost of one adult ticket to the cost of one student ticket.
 J The ratio of the cost of one student ticket to the cost of one adult ticket.
- 9 The number of fish in a lake was 650 in January. In March, there were 570 fish. If the number of fish continues to decrease at this rate, what is a reasonable estimate for the number of fish remaining in September?

- A 490 C 330
 B 440 D 290

month	fish
1	650
3	570
5	490
7	410
9	330

-80

- 10 Solve the equation $4e - 5 + 2e = e + 3 - 2e$ for e .

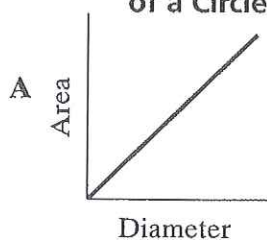
- F 7
 G $-\frac{7}{8}$

$$\begin{array}{r} 6e - 5 = -e + 3 \\ 7e + 5 = -e + 3 \\ 8e = -2 \\ e = -\frac{1}{4} \end{array}$$

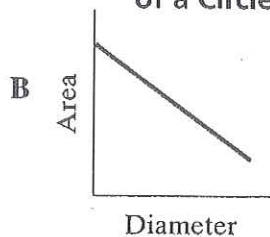
Combine like terms 1st!

- 11 Which of the following graphs would best represent the relationship between the diameter and the area of a circle?

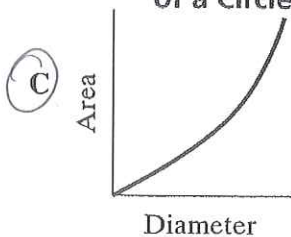
Area vs. Diameter of a Circle



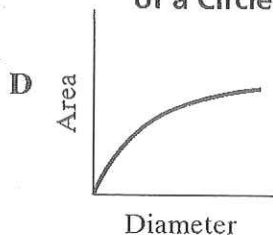
Area vs. Diameter of a Circle



Area vs. Diameter of a Circle



Area vs. Diameter of a Circle



A = πr²
parabola



out front

12 How will the graph of $y = 5x^2$ be affected if the coefficient of x^2 becomes -5 ?

- F The graph will become wider.
- G The graph will become narrower.
- H The graph will be reflected across the y -axis.
- J** The graph will be reflected across the x -axis.

$y = 5x^2 \rightarrow y = -5x^2$

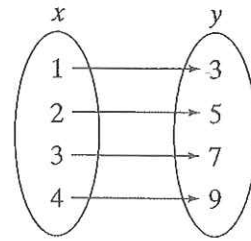
13 At Colson's Discount Bookstore, paperbacks cost \$4.50 each and hardbacks cost \$8.00 each. Which equation best describes the number of paperbacks, p , and hardbacks, h , that can be purchased for \$65.00?

- A $8p + 4.5h = 65$
- B** $4.5p + 8h = 65$
- C $12.5(p + h) = 65$
- D $65(p + h) = 12.5$

14 The function $f(x) = 60 + 10x$ represents a test score, $f(x)$, of a student studying x hours for a test. The student studies for no more than 3 hours. What is the range of the function?

- ~~F~~ $0 \leq x \leq 3$
- ~~G~~ $0 \leq x \leq 60$
- ~~H~~ $0 \leq f(x) \leq 3$
- J** $60 \leq f(x) \leq 90$

15 A function is represented in the mapping diagram below.

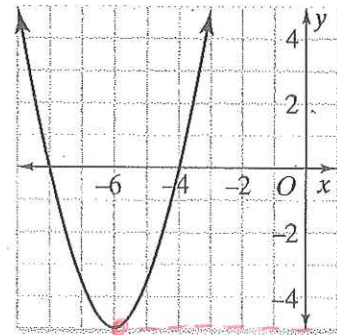


Which of the following is NOT another correct representation of this function?

- A The range is $\{3, 5, 7, 9\}$ and $y = 2x + 1$.
- B The domain is $\{1, 2, 3, 4\}$ and the range is $\{3, 5, 7, 9\}$.
- C x is a positive integer less than 5 and $y = 2x + 1$.
- D $\{(1, 3), (2, 5), (3, 7), (4, 9)\}$

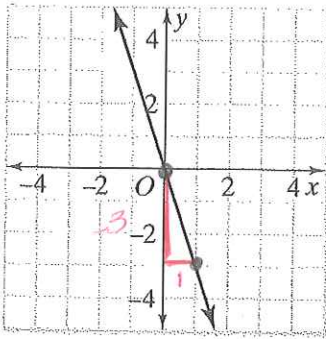
ALL answers are correct representations.

16 Which describes the range of the function with the graph shown below?



- F $y \geq 0$
- G** $y \geq -5$
- H $x \geq -6$
- J $y \geq -6$

17 Which equation best describes the graph below?



(A) $y = -3x$

$\frac{\text{rise}}{\text{run}} = \frac{-3}{1}$

B $y = -\frac{1}{3}x$

C $y = 3x$

D $y = \frac{1}{3}x$

18 What is the x-intercept of the function $f(x) = 2(x - 5)$?

← when $y=0$

Record your answer and fill in the bubbles on your answer document.

$0 = 2(x - 5)$ $10 = 2x$
 $0 = 2x - 10$ $\boxed{5 = x}$

19 Solve the equation $2x + 3 - 5x = 3x + 5 - x$ for x .

(A) $-\frac{2}{5}$

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

C 2

D 3

$$\begin{array}{r|l} -3x + 3 & = 2x + 5 \\ +3x & +3x \\ \hline 3 & = 5x + 5 \\ -5 & -5 \\ \hline -2 & = 5x \\ \hline -\frac{2}{5} & = x \end{array}$$

20 For a fundraiser, the Math Club sold a ticket for each square yard of a football field. They randomly selected one square yard from the field to find out the winner of a \$5000 prize. If the function $p(x) = 5x - 5000$ gives the profit from the sale, which statement best interprets the slope of this function?

F The Math Club sold 5 tickets.

G The Math Club sold 5000 tickets.

(H) The Math Club sold tickets for \$5 each.

J The Math Club sold tickets for \$5000 each.

21 A relation is given by the ordered pairs $\{(-4, 9), (-2, 0), (0, -3), (2, 4), (4, -1)\}$. What is the domain of the relation?

A $\{\dots, -4, -2, 0, 2, 4, \dots\}$

(B) $\{-4, -2, 0, 2, 4\}$

C all even integers and their opposites

D all real numbers

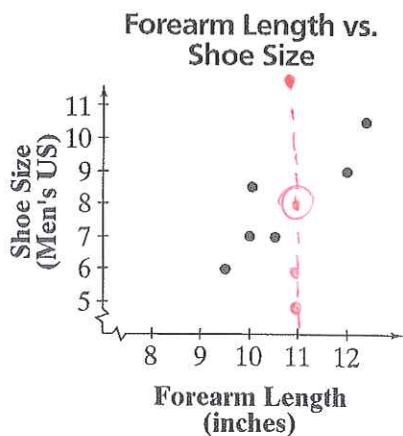


- 22 John plants trees for a living. He has weekly expenses of \$425 plus an additional \$35 for each tree. If he charges \$120 for each tree he plants, how many trees does he have to plant each week before he can make a profit?

Record your answer and fill in the bubbles on your answer document.

$y = -425 - 35x + 120x$
type into "y=" & look for y to be positive
(trees)

- 23 The following scatter plot shows the relationship between the forearm length and shoe size of a group of mathematics students.



Based on these results, if Jim has a forearm length of 11 inches, which is the best estimate of his shoe size?

- A 12 C 6
 B 8 D 4

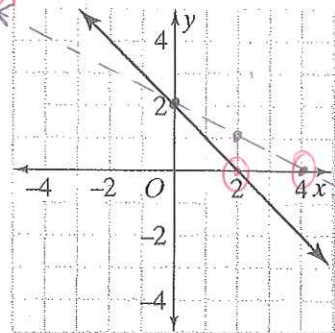
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total cost

- 24 The function $f(x) = 9.75x$ represents the total cost, $f(x)$, for x tickets to a movie. Which statement is true if the function changes to $f(x) = 10.25x$?

- F The total cost increased from \$9.75 to \$10.25.
 G The total cost decreased from \$10.25 to \$9.75.
 H The cost for each movie ticket increased from \$9.75 to \$10.25.
 J The cost for each movie ticket decreased from \$10.25 to \$9.75.

- 25 The line represented by the equation $y = -x + 2$ is graphed below.

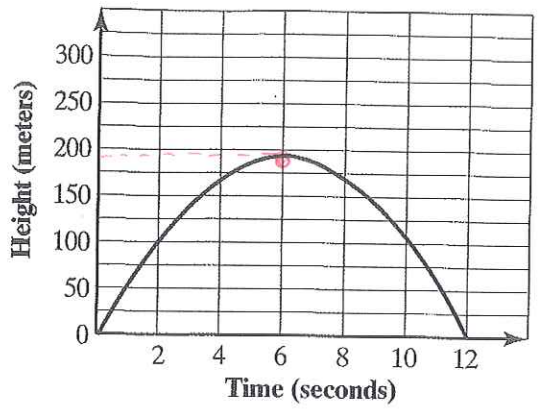


y-intercept doesn't change

Which of the following best describes the change in the graph if the line becomes $y = -\frac{1}{2}x + 2$?

- A The x -intercept increases.
 B The y -intercept increases.
 C The x -intercept decreases.
 D The y -intercept decreases.

26 A model rocket was fired upward at an initial speed of 60 meters per second. The function $h = 60t - 4.9t^2$ shows the relationship between the time elapsed and the rocket's height above the ground, where t is the time in seconds and h is the height in meters. The graph of this function is shown below.



What is the best conclusion about the rocket's movement?

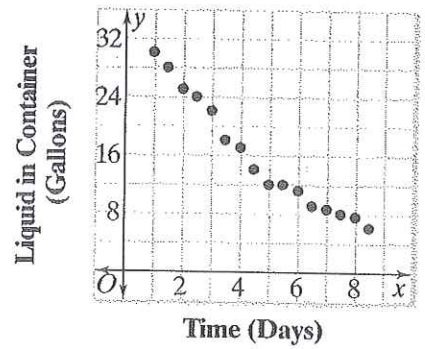
- F The speed of the rocket was greatest at about 6 seconds after it was fired.
- G The rocket traveled 180 meters.
- H The rocket reached its maximum height in about 6 seconds.
- J The rocket returned to the ground in about 6 seconds.

27 A movie theater sold a total of 205 tickets to a movie, for a total of \$1621. Adult tickets were \$9 and student tickets were \$5. What was the number of student tickets sold?

Record your answer and fill in the bubbles on your answer document.

$$\begin{aligned} -9(a+s = 205) &\rightarrow -9a - 9s = -1845 \\ 9a + 5s &= 1621 \\ \hline -4s &= -224 \\ s &= \boxed{56} \end{aligned}$$

28 Which best describes the correlation shown in the scatterplot below?



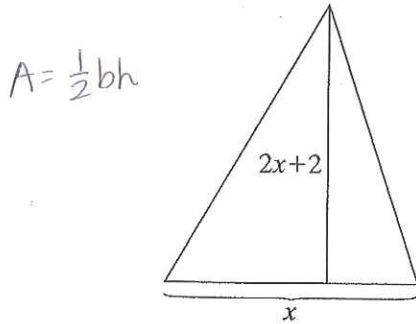
- F absolute correlation
- G negative correlation
- H positive correlation
- J no correlation

* Remember:

- ① graphing - when both equations are solved for the same variable
- ② substitution - when one variable is by itself.
- ③ elimination - when variable cancels.



- 29 Which equation best represents the area, A , of the triangle below?



- A $A = (2x + 2) + x$
 B $A = (2x + 2)x$
 C $A = \frac{1}{2}(2x + 2)x$
 D $A = (2x + 2) - x$

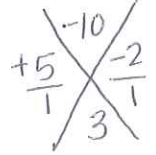
- 30 A function is described by the equation $f(x) = 2x + 3$. The replacement set for the independent variable is $\{2, 4, 6, 8\}$. Which set is the corresponding set for the dependent variable?

- F $\{4, 8, 12, 16\}$
 G $\{2, 4, 6, 8\}$
 H $\{1, 5, 9, 13\}$
 J $\{7, 11, 15, 19\}$

$2(2) + 3 = 7$
 $2(4) + 3 = 11$
 $2(6) + 3 = 15$
 $2(8) + 3 = 19$

- 31 What are the x -intercepts of the graph of the equation $y = x^2 + 3x - 10$?

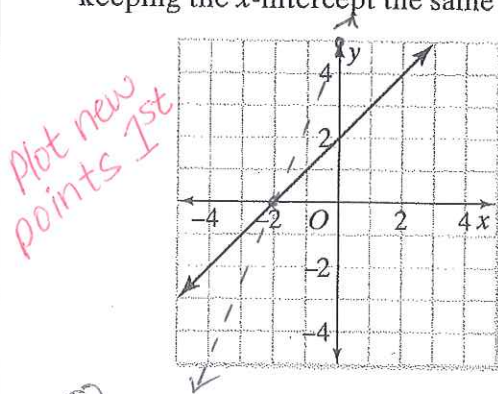
- A $x = -2, x = -5$
 B $x = -2, x = 5$
 C $x = 2, x = 5$
 D $x = 2, x = -5$



Factor & solve \rightarrow
 OR put in "y=" & look for y=0

$(x+5)(x-2) = 0$
 $x+5=0 \quad x-2=0$
 $x=-5 \quad x=2$

- 32 Which best describes the effect of shifting the y -intercept of this graph up 3 units, but keeping the x -intercept the same?



- F The slope increases.
 G The slope decreases.
 H The slope does not change.
 J The slope changes sign.

33 The table below shows the relationship between the number of buses in the school parking lot and the number of students on those buses.

Number of Buses, x	Number of Students, y
1	25
2	50
3	75
4	100

What does the slope of the line containing these points represent?

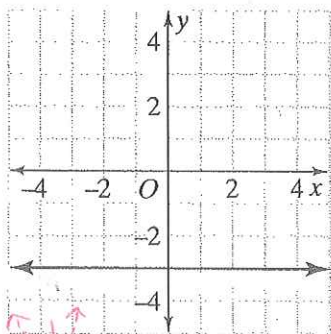
- A the number of students on an empty bus
- B** the number of students each bus can hold
- C the number of buses used by the school
- D the number of students at the school

34 What are the roots of the quadratic equation $2x^2 + 6x - 20 = 0$?

- F 2 and 5
- H -2 and 5
- G** 2 and -5
- J -2 and -5

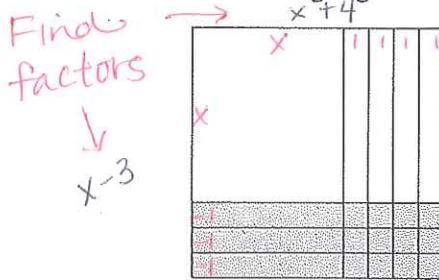
Factor & solve OR type in "y=" & look for when y=0.

35 Which type of function is graphed below?



- A quadratic
- B exponential
- C** linear ← straight line
- D logarithmic

36 The quadratic expression $x^2 + x - 12$ is modeled below using algebraic tiles.



What are the solutions to the equation $x^2 + x - 12 = 0$?

- F $x = -3$ and $x = -4$
- G $x = 3$ and $x = 4$
- H** $x = 3$ and $x = -4$
- J $x = -3$ and $x = 4$

proportional

37 The distance Doug travels is directly related to the amount of time he travels. Doug travels 168 miles at a constant rate for 3 hours. How many hours will it take Doug to travel 392 miles at the same rate?

Record your answer and fill in the bubbles on your answer document.

$$\frac{168}{3} = \frac{392}{x}$$

$$\frac{1176}{168} = \frac{168x}{168}$$

$$\boxed{7} = x$$

GO ON →

38 What is the equation of the line that passes through the points (0, 3) and (2, 0)?

F $y = \frac{2}{3}x + 3$

G $y = -\frac{2}{3}x + 2$

H $y = -\frac{3}{2}x + 3$

J $y = \frac{3}{2}x + 2$

y intercept
 $y = \frac{2}{3}(2) + 3$
 should = 0
 $y = -\frac{3}{2}(2) + 3$

39 Jamie and Cynthia sold a total of 84 raffle tickets. Jamie sold 3 fewer than twice the number Cynthia sold. Which system of equations could be used to determine the number of raffle tickets sold by Jamie, j , and Cynthia, c ?

A $j + c = 84$
 $j + 2c = 3$

B $j + c = 84$
 $2j - c = -3$

C $j + c = 84$
 $j + 3c = 2$

D $j + c = 84$
 $j - 2c = -3$

$J = 2C - 3$
 $-2C - 2C$
 $J - 2C = -3$

40 If the domain of the function $y = 2x^2 + 2$ is $0 < x < 5$, what is the corresponding range?

F $0 < y < 5$

G $2 < y < 10$

H $0 < y < 52$

J $2 < y < 52$

plug in for x & solve for y.
 $2(0)^2 + 2 = 2$
 $2(5)^2 + 2 = 52$

41 Which equation best describes the relationship between hours of studying, h , and the grade on the test, g , in this table?

Hours of Studying	Grade on Test (%)
0	74
0.5	80
1.0	86
1.5	92
2.0	98

A $g = 6h + 37$

B $h = 6g + 37$

C $g = 12h + 74$

D $h = 12g + 74$

g depends on h

42 Simplify the algebraic expression

$-2(x + 3)(x - 3) + 3(x^2 + 2x + 1)$

F $x^2 + 6x + 21$ $(-2x - 6)(x - 3) + 3x^2 + 6x + 3$

G $5x^2 + 12x + 9$

H $2x^2 + 6x + 9$

J $x^2 + 6x + 15$

$-2x^2 + 6x - 6x + 18 + 3x^2 + 6x + 3$
 $x^2 + 6x + 21$

Box method or FOIL

43 What is the solution to the system of equations shown below?

$4x - 3y = -7$
 $-2(2x + 2y = 14)$

$4x - 3y = -7$
 $-4x - 4y = -28$
 $-7y = -35$
 $y = 5$

A (1, 7)

B (2, 5)

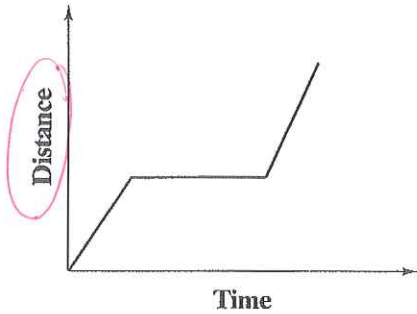
C (3, 4)

D (0, 1)

Use graphing substitution or elimination



44 Which situation best describes the graph?



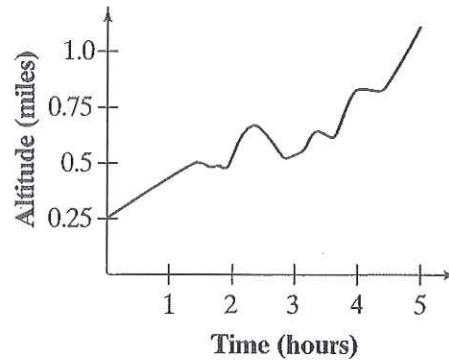
- F An airplane took off from the airport, then turned right, then turned left. *distance?*
- G A car traveled at a constant rate, then stopped at a traffic light, then traveled at a constant rate.
- H Jake jogged at a constant rate, then stopped to take a break. *doesn't talk about 3rd piece*
- J Lydia ascended up a mountain, then descended down the mountain.

45 What is the first step in solving the inequality

$$-3x + 1 < -11?$$

- A Add 11 to both sides of the inequality.
- B Divide both sides of the inequality by -3 .
- C Subtract 1 from both sides of the inequality.
- D Divide both sides of the inequality by -3 and reverse the inequality sign.

46 The graph below best represents which of the following situations?



- F An ant crawls into his anthill. *would only go down*
- G A person rides a roller coaster. *would not go up & down miles.*
- H A family drives through a mountainous area. *altitude doesn't change*
- J A racer runs a one-mile race around the track.

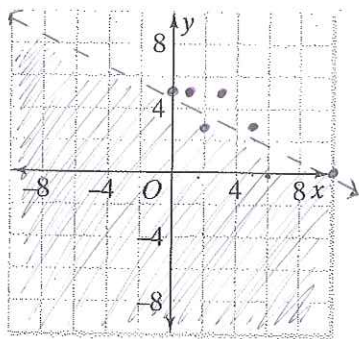
47 At a sporting goods store, the total cost of a baseball and a basketball is \$12.50. The cost of three baseballs and two basketballs is \$29.00. Which pair of equations can be used to determine the price of a baseball, b , and the price of a basketball, k ?

- A $b + k = 12.50$
 $5(b + k) = 29.00$
- B $3b + 2k = 12.50$
 $b + k = 29.00$
- C $b + k = 12.50$
 $3b + 3k = 29.00$
- D $b + k = 12.50$
 $3b + 2k = 29.00$

GO ON

- 48 Jane purchased x cans of paint at \$2 each and y packs of markers at \$4 each. She spent less than \$20, not including tax. Use the grid below to graph the inequality $2x + 4y < 20$.

- Find intercepts
 - Graph
 - Dotted line b/c $<$ not \leq
 - Shade below for less than
 - plot points



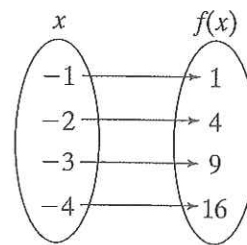
Which point represents a reasonable number of cans of paint and packs of markers that Jane purchased?

- F (5, 3) H (3, 5)
 G (2, 3) J (1, 5)

- 49 The equation $y = 35 + 25x$ represents the cost, y , Jeremy pays a plumber for x hours of service. What function represents the cost, $f(x)$ for x hours of service?

- A $x = 35 + 25f(x)$
 B $x = 25 + 35f(x)$
 C $f(x) = 25 + 35x$
 D $f(x) = 35 + 25x$

- 50 A function is represented in the mapping diagram below.

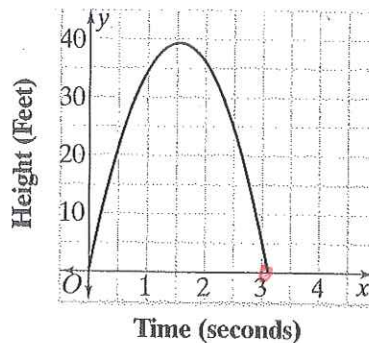


Which of the following is NOT another correct representation of this function?

- F The domain is $\{-1, -2, -3, -4\}$ and $f(x) = x^2$.
 G The domain is $\{-1, -2, -3, -4\}$ and $f(x) = x^2$.
 H x is a negative integer greater than -5 and $f(x) = x^2$.
 J $\{(-1, 1), (-2, 4), (-3, 9), (-4, 16)\}$

All answers are correct representations

- 51 The quadratic function below models the path of a soccer ball as it is kicked up in the air.

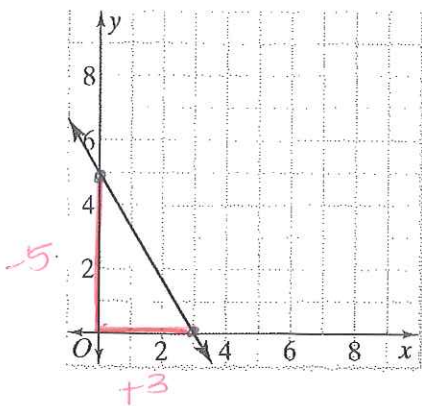


About how long does it take the ball to hit the ground?

- A 1.5 seconds
 B 3 seconds
 C 5 seconds
 D 40 seconds

GO ON

52 What is m , the slope of the line that is shown in the graph below?



- F $\frac{5}{3}$
- G** $-\frac{5}{3}$
- H $\frac{3}{5}$
- J $-\frac{3}{5}$

$\frac{\text{rise}}{\text{run}} = \frac{-5}{3}$

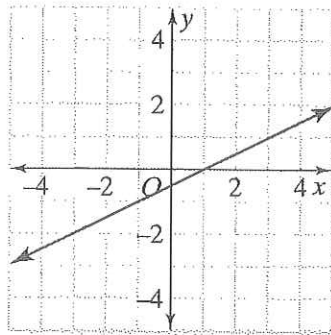
53 The table shows the number of inches of accumulated snowfall, $f(x)$, after x hours.

Hours, x	Accumulated Snowfall (in inches), $f(x)$
1	1.75
3	4.25
4	5.5
7	9.25

Can this situation be represented by a linear function? If so, what is the function?

- A no
- B yes; $f(x) = 1.75x$
- C** yes; $f(x) = 1.25x + 0.5$
- D yes; $f(x) = 1.75x + 0.5$

54 Which equation best represents the line on the graph?



*Solve for y
- Which equation matches graph?*

- F $y + 2x = 2$ $y = -2x + 2$
- G $2y - 2x = 2$ $y = x + 1$
- H** $2y - x = -1$ $y = \frac{1}{2}x - \frac{1}{2}$
- J $2y + x = 2$ $y = -\frac{1}{2}x + 1$

G $2y - 2x = 2$
 $2y = 2x + 2$
 $y = x + 1$

H $2y - x = -1$
 $2y = x - 1$
 $y = \frac{1}{2}x - \frac{1}{2}$

J $2y + x = 2$
 $2y = -x + 2$
 $y = -\frac{1}{2}x + 1$

