Linear Equations

1. Better Cars is renting Simon a car. The deal they are offering is an initial charge of $40 plus $1.25 for every mile he drives the car. If the total cost of renting the car is $77.50, how many miles did Simon drive the car?
   A. 20
   B. 25
   C. 30
   D. 35
   E. 40

2. The graph in the standard (x, y) coordinate plane below represents which of the following equations?
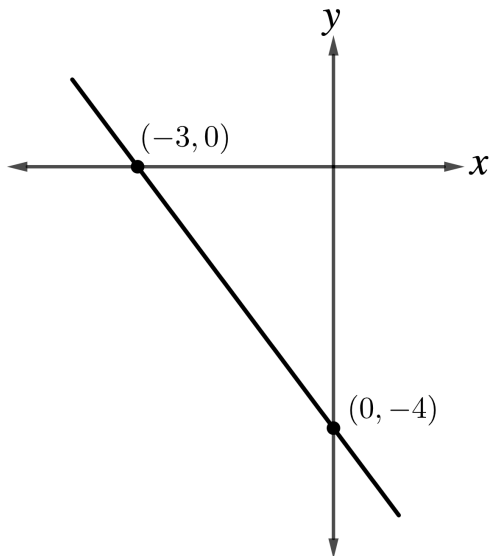
A. $y = -\frac{4}{3}x - 4$

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

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

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

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

3. In the standard (x, y) coordinate plane, what is the slope of the line $3x - 6y = 75$?

   A. -2

   B. $-\dfrac{1}{2}$

   C. $\dfrac{1}{2}$

   D. 2

   E. 75

4. What is the slope of a line that passes through $(6,16)$ and $(4,4)$ in the standard (x, y) coordinate plane?

   A. -6

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

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

   D. 6

   E. 12

5. An internet service provider charges a \$100 per month, plus \$3 for every megabyte of data used. Which of the following equations models the relationship between C, the total monthly cost, and D, the amount of data, in megabytes, used per month?

   A. $D = 100C + 3$

   B. $D = 3C + 100$

   C. $C = 100D + 3$

   D. $C = 3D + 100$

   E. $100C + 3D = 0$

6. A line, m, graphed on the standard (x, y) plane is represented by the equation $y = \dfrac{1}{2}x + 7$. Which of the following equations could represent a line perpendicular to m?

   A. $y = -2x + 7$

   B. $y = -\dfrac{1}{2}x + 7$

   C. $y = \dfrac{1}{2}x - 7$

   D. $y = 2x - 7$

   E. $y = 2x + 7$

7. In the standard (x, y) coordinate plane, what is the slope of the line $8x + 14y - 100 = 0$?

A. $-\dfrac{4}{7}$

B. $-\dfrac{7}{4}$

C. $\dfrac{25}{4}$

D. 8

E. 100

8. The points $(-3, -2), (0, 4)$, and $(2, 8)$ lie on a line in the standard (x, y) coordinate plane. Which of the following points also lies on that line?
A. $(-4, -4)$
B. $(-1, -5)$
C. $(1, 5)$
D. $(4, 4)$
E. $(3, 12)$

9. The ordered pairs (x, y) in one of the following tables belongs to a linear function. Which one?

A.

x	y
0	1
1	0
2	1

D.

| x	y
0	4
1	4
2	3

B.

x	y
0	1
1	5
2	4

E.

x	y
0	6
1	5
2	4

C.

| x	y
0	0
1	1
2	1

10. A student noticed a pattern whenever they took a science test. With no studying, the student always achieved a score of 55. With every hour of studying that the student did before the test, however, their score rose by an average of 3.5 points. At least how many hours does the student need to study in order to guarantee themselves a grade of 90 or above?

A. 1
B. 5
C. 10
D. 17
E. 35

11. A line is graphed in the standard (x, y) coordinate plane. The line crosses the y-axis when $y = 5$. Another point on the line is $(4,1)$. Which of the following is the equation of the line?

A. $y = -x + 5$
B. $y = -x - 5$
C. $y = x + 4$
D. $y = x + 5$
E. $y = 5$

12. When Jason was 10 years old, he put all the money he had into his piggy bank. Each year after, he received $120 on his birthday as well as $45 from raking leaves, and then he added both to the original amount in his piggy bank. Eight years later, at his high school graduation, he broke open the piggy bank and found $1,500. How much did he initially put into his savings?

A. 165
B. 180
C. 330
D. 540
E. 1,320

13. A certain basketball team tracked the number of hours its players practiced free throws. At the end of the season, the coach plotted the data in the standard (x, y) coordinate plane with the average hours per week practiced on the x-axis and the free-throw shooting percentage on the y-axis as show in the figure below. He performed a linear regression of the data. Which of the following is true of the regression equation?
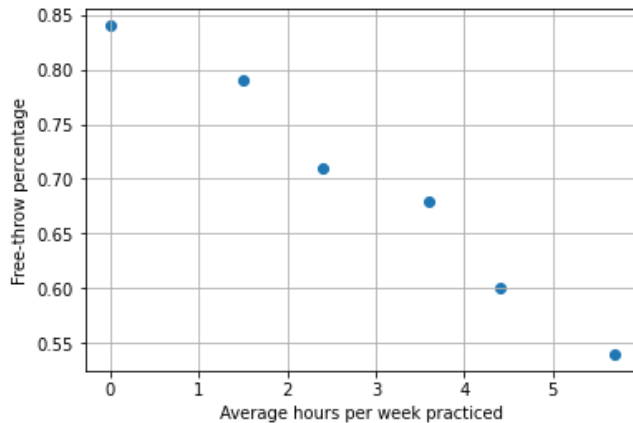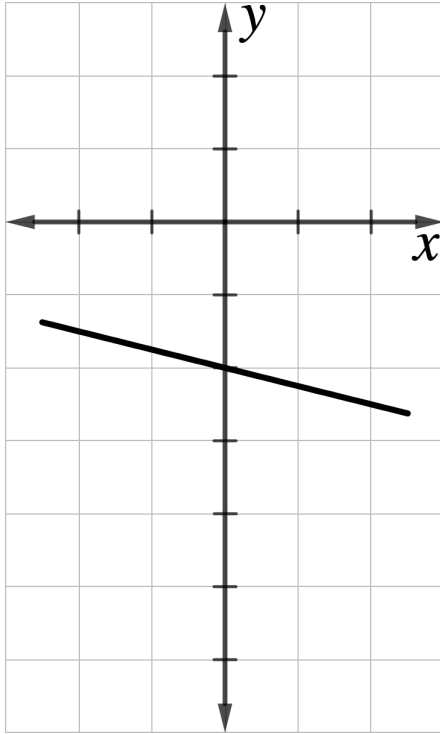

A. The slope and the y-intercept are both positive.
B. The slope and the y-intercept are both negative.
C. The slope is negative and the y-intercept is positive.
D. The slope is positive and the y-intercept is negative.
E. The slope is zero and the y-intercept is positive.

14. Which of the following equations represents a line parallel to the graph below?
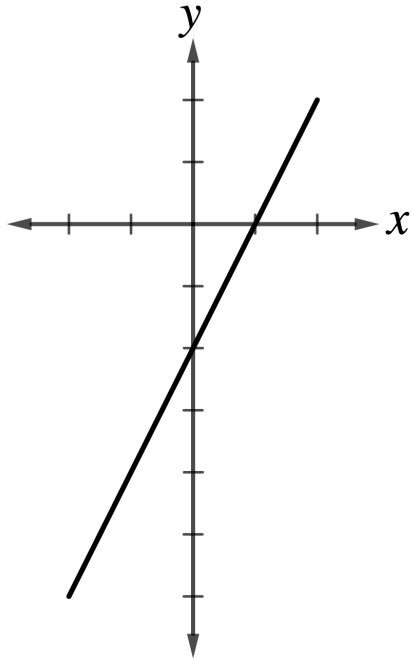
A. $y = -\frac{1}{2}x + 5$

B. $y = \frac{1}{2}x - 5$

C. $y = \frac{1}{2}x + 5$

D. $y = 2x - 5$

E. $y = 2$

15. Which of the following equations represents a line perpendicular to the graph below?

A. $y = -\dfrac{1}{4}x + 5$

B. $y = \dfrac{1}{4}x - 5$

C. $y = 4x + 5$

D. $y = -4x - 5$

E. $y = 4$