

LESSONS - ALGEBRA

1. In 2014, County X had 783 miles of paved roads. Starting in 2015, the county has been building 8 miles of new paved roads each year. At this rate, how many miles of paved road will County X have in 2030? (Assume that no paved roads go out of service.)

2. In 2014, County X had 783 miles of paved roads. Starting in 2015, the county has been building 8 miles of new paved roads each year. At this rate, which of the following functions f gives the number of miles of paved road there will be in County X n years after 2014? (Assume that no paved roads go out of service.)
 - A) $f(n) = 8 + 783n$
 - B) $f(n) = 2,014 + 783n$
 - C) $f(n) = 783 + 8n$
 - D) $f(n) = 2,014 + 8n$

3. In 2014, County X had 783 miles of paved roads. Starting in 2015, the county has been building 8 miles of new paved roads each year. At this rate, in which year will County X first have at least 1,000 miles of paved roads? (Assume that no paved roads go out of service.)

4. To edit a manuscript, Miguel charges \$50 for the first 2 hours and \$20 per hour after the first 2 hours. Which of the following expresses the amount, C , in dollars, Miguel charges if it takes him x hours to edit a manuscript, where $x > 2$?
- A) $C = 20x$
 - B) $C = 20x + 10$
 - C) $C = 20x + 50$
 - D) $C = 20x + 90$
5. A builder uses the function g defined by $g(x) = 110x + 10,000$ to estimate the cost $g(x)$, in dollars, to build a one-story home of planned floor area of x square feet in Stillwater. If the builder estimates that the cost to build a certain one-story home in Stillwater is \$142,000, what is the planned floor area, in square feet, of the home?

System of Linear Equations

6. Maizah bought pants and a briefcase at a department store. The sum of the prices of the pants and the briefcase before sales tax was \$130.00. There was no sales tax on the pants and a 9% sales tax on the briefcase. The total Maizah paid, including the sales tax, was \$136.75. What was the price, in dollars, of the pants?

Inequalities in Context

7. Each morning, John jogs at 6 miles per hour and rides a bike at 12 miles per hour. His goal is to jog and ride his bike a total of at least 9 miles in no more than 1 hour. If John jogs j miles and rides his bike b miles, which of the following systems of inequalities represents John's goal?

- A) $\frac{j}{6} + \frac{b}{12} \leq 1$ and $j + b \geq 9$
B) $\frac{j}{6} + \frac{b}{12} \geq 1$ and $j + b \leq 9$
C) $6j + 12b \geq 9$ and $j + b \leq 1$
D) $6j + 12b \geq 1$ and $j + b \geq 9$

Solving Linear Equations, Linear Inequalities, and Systems of Linear Equations

$$3\left(\frac{1}{2} - x\right) = \frac{3}{5} + 15x$$

8. What is the solution to the given equation?

$$-2(3x + 2.4) = -3(3x + 2.4)$$

9. What is the solution to the given equation?

$$-2x = 4y + 6$$

$$2(2y + 3) = 3x - 5$$

10. What is the solution (x,y) to the given system of equations?

- (A) (1, 2)
- (B) (1, -2)
- (C) (-1, -1)
- (D) (-1, 1)

Linear Equations and Lines in the Coordinate Plane

$$2y + 6x = 3$$

$$y + 3x = 2$$

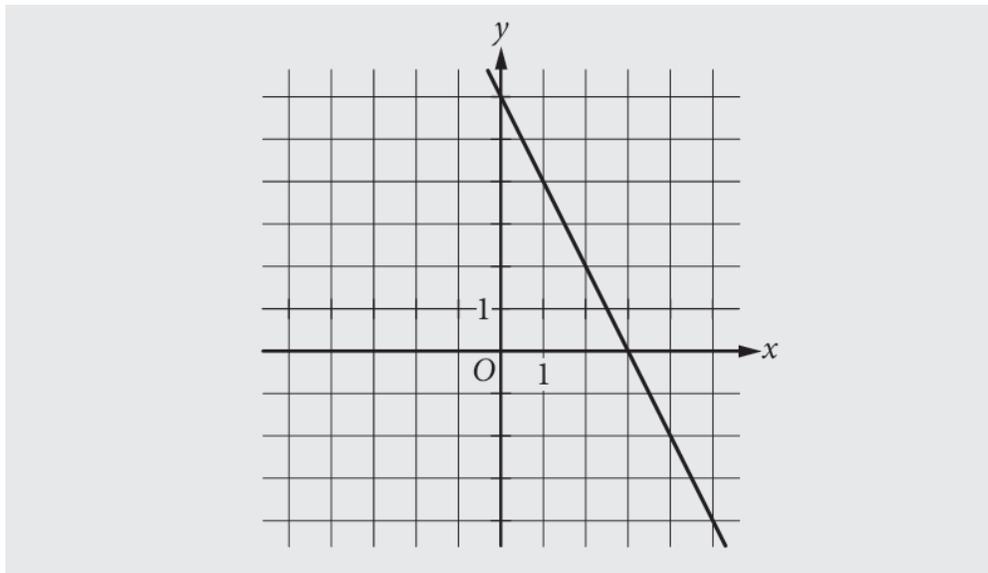
11. How many solutions (x, y) does the given system of equations have?

- A) Zero
- B) Exactly one
- C) Exactly two
- D) Infinitely many

$$3s - 2t = a$$

$$-15s + bt = -7$$

12. In the given system of equations, a and b are constants. If the system has infinitely many solutions, what is the value of a ?



13. The graph of line k is shown in the xy -plane. Which of the following is an equation of a line that is perpendicular to line k ?

- (A) $y = -2x + 1$
- (B) $y = -\frac{1}{2}x + 2$
- (C) $y = \frac{1}{2}x + 3$
- (D) $y = 2x + 4$

14. A voter registration drive was held in Town Y. The number of voters, V , registered T days after the drive began can be estimated by the equation $V = 3,450 + 65T$. What is the best interpretation of the number 65 in this context?

- (A) The estimated number of registered voters at the beginning of the registration drive
- (B) The estimated number of registered voters at the end of the registration drive
- (C) The estimated number of voters registered during the drive
- (D) The estimated number of voters registered each day during the drive

ANSWERS

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|----------|--------------------------|
| 1. 911 | 8. $\frac{1}{20}$ or .05 |
| 2. C | 9. -0.8 |
| 3. 2,042 | 10. B |
| 4. B | 11. A |
| 5. 1,200 | 12. $\frac{7}{5}$ |
| 6. \$55 | 13. C |
| 7. A | 14. D |

Answer explanations can be found in the [Digital SAT Study Guide](#) on pages 207 to 217.