

DID YOU HEAR ABOUT the antelope who was getting dressed when he was trampled by a herd of buffalo?

Well,	1	2	3	4	5	6
7	8	9	10	11	12	13

Solve each system of equations by the substitution method. Write the word next to the correct answer in the box containing the exercise number.

- $y = 3x$
 $5x + 2y = 44$
 $5x + 2(3x) = 44 \rightarrow 11x = 44 \rightarrow x = 4$
 $y = 3(4) = 12$
(4, 12)
- $x = 5y - 1$
 $x + 2y = 13$
 $5y - 1 + 2y = 13 \rightarrow 7y = 14 \rightarrow y = 2$
 $x = 5(2) - 1 = 9$
(9, 2)
- $y = 2x + 7$
 $3x - y = -9$
 $3x - (2x + 7) = -9 \rightarrow x - 7 = -9 \rightarrow x = -2$
 $y = 2(-2) + 7 = 3$
(-2, 3)
- $-2x + 3y = 11$
 $x = 4y - 3$
 $-2(4y - 3) + 3y = 11 \rightarrow -8y + 6 + 3y = 11 \rightarrow -5y = 5 \rightarrow y = -1$
 $x = 4(-1) - 3 = -7$
(-7, -1)
- $y = 6x - 5$
 $y = -x + 9$
 $6x - 5 = -x + 9 \rightarrow 7x = 14 \rightarrow x = 2$
 $y = 6(2) - 5 = 7$
(2, 7)
- $-3x + y = 7$
 $5x + 2y = 3$
 $-3x + (5x + 2y - 3) = 7 \rightarrow 2x + 2y = 10 \rightarrow x + y = 5$
 $x = 5 - y$
 $5(5 - y) + 2y = 3 \rightarrow 25 - 5y + 2y = 3 \rightarrow -3y = -22 \rightarrow y = \frac{22}{3}$
 $x = 5 - \frac{22}{3} = -\frac{7}{3}$
(-\frac{7}{3}, \frac{22}{3})
- $x - y = 11$
 $3x + 10y = -6$
 $3(x - y + 11) + 10y = -6 \rightarrow 3x - 3y + 33 + 10y = -6 \rightarrow 3x + 7y = -39$
 $3(x - y) = -39 - 7y \rightarrow x - y = -13 - \frac{7}{3}y$
 $x - y + y = -13 - \frac{7}{3}y + y \rightarrow x = -13 - \frac{4}{3}y$
 $-13 - \frac{4}{3}y - y = 11 \rightarrow -13 - \frac{7}{3}y = 11 \rightarrow -\frac{7}{3}y = 24 \rightarrow y = -\frac{24}{7}$
 $x = -13 - \frac{4}{3}(-\frac{24}{7}) = -13 + \frac{32}{7} = -\frac{61}{7}$
(-\frac{61}{7}, -\frac{24}{7})
- $-4x + y = 4$
 $2x + 2y = 13$
 $-4x + (2x + 2y - 13) = 4 \rightarrow -2x + 2y = 17 \rightarrow -x + y = \frac{17}{2}$
 $-x + y - y = \frac{17}{2} - 2y \rightarrow -x = \frac{17}{2} - 2y \rightarrow x = -\frac{17}{2} + 2y$
 $-4(-\frac{17}{2} + 2y) + y = 4 \rightarrow 34 - 8y + y = 4 \rightarrow -7y = -30 \rightarrow y = \frac{30}{7}$
 $x = -\frac{17}{2} + 2(\frac{30}{7}) = -\frac{17}{2} + \frac{60}{7} = \frac{59}{14}$
(\frac{59}{14}, \frac{30}{7})
- $x + y = 1$
 $5x - 4y = -7$
 $5(x + y - 1) - 4y = -7 \rightarrow 5x + 5y - 5 - 4y = -7 \rightarrow 5x + y = -2$
 $5(x + y) - 4y = -10 - 2 \rightarrow 5x + y = -12$
 $5x + y - 5x = -12 - 5x \rightarrow y = -12 - 5x$
 $5x - 4(-12 - 5x) = -7 \rightarrow 5x + 48 + 20x = -7 \rightarrow 25x = -55 \rightarrow x = -\frac{11}{5}$
 $y = -12 - 5(-\frac{11}{5}) = -12 + 11 = -1$
(-\frac{11}{5}, -1)
- $-5x + 3y = 11$
 $x - 2y = 2$
 $-5(x - 2y + 2) + 3y = 11 \rightarrow -5x + 10y - 10 + 3y = 11 \rightarrow -5x + 13y = 21$
 $-5(x - 2y) + 13y = 21 + 10 \rightarrow -5x + 10y + 13y = 31 \rightarrow -5x + 23y = 31$
 $-5x + 23y - (-5x + 13y) = 31 - 21 \rightarrow 10y = 10 \rightarrow y = 1$
 $x - 2(1) = 2 \rightarrow x - 2 = 2 \rightarrow x = 4$
(4, 1)
- $x + 9y = -1$
 $2x + 4y = 5$
 $2(x + 9y + 1) + 4y = 5 \rightarrow 2x + 18y + 2 + 4y = 5 \rightarrow 2x + 22y = 3$
 $2(x + 9y) = 3 - 22y \rightarrow x + 9y = \frac{3 - 22y}{2}$
 $x + 9y - 9y = \frac{3 - 22y}{2} - 9y \rightarrow x = \frac{3 - 22y}{2} - 9y = \frac{3 - 22y - 18y}{2} = \frac{3 - 40y}{2}$
 $\frac{3 - 40y}{2} + 9y = -1 \rightarrow \frac{3 - 40y + 18y}{2} = -1 \rightarrow \frac{3 - 22y}{2} = -1 \rightarrow 3 - 22y = -2 \rightarrow -22y = -5 \rightarrow y = \frac{5}{22}$
 $x = \frac{3 - 40(\frac{5}{22})}{2} = \frac{3 - \frac{200}{22}}{2} = \frac{\frac{6 - 200}{22}}{2} = \frac{-194}{44} = -\frac{97}{22}$
(-\frac{97}{22}, \frac{5}{22})
- A math test is worth 100 points and has 30 problems. Each problem is worth either 3 points or 4 points. How many 4-point problems are there?

 $x + y = 30$
 $3x + 4y = 100$
 $x = 30 - y$
 $3(30 - y) + 4y = 100 \rightarrow 90 - 3y + 4y = 100 \rightarrow y = 10$
 $x = 30 - 10 = 20$
(20, 10)

(-2, 2) OFTEN

(\frac{1}{2}, -3) RANGE

(9, 2) FAR #2

(-7, 0) STAMPED #12

(2, 7) KNOW #5

(-\frac{1}{3}, \frac{4}{3}) FIRST #9

(4, 12) AS #1

(-1, -3) HOME

(8, -3) WAS #7

(\frac{7}{2}, -\frac{1}{2}) DRESSED #11

14 WESTERN

(-7, -1) WE #4

(-\frac{1}{3}, -1) BIGGEST

(-1, 4) THIS #6

10 ANTELOPE #13

(-4, -3) SELF #

(-2, 3) AS #3

(2, 1) COWBOYS

(\frac{1}{2}, 6) THE #8

(-7, -\frac{1}{2}) DEFENSE

$$6) \quad -3x + y = 7 \Rightarrow y = 3x + 7$$

$$5x + 2y = 3 \quad \swarrow$$

$$5x + 2(3x + 7) = 3$$

$$5x + 6x + 14 = 3$$

$$11x + 14 = 3$$

$$11x = -11$$

$$x = -1$$

$$(-1, 4)$$

$$-3(-1) + y = 7$$

$$3 + y = 7$$

$$y = 4$$

$$9) \quad x + y = 1 \Rightarrow x = -y + 1$$

$$5x - 4y = -7 \quad \swarrow$$

$$5(-y + 1) - 4y = -7$$

$$-5y + 5 - 4y = -7$$

$$-9y + 5 = -7$$

$$-9y = -12$$

$$y = \frac{4}{3}$$

$$\left(-\frac{1}{3}, \frac{4}{3}\right)$$

$$x + \frac{4}{3} = 1$$

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

$$7) \quad x - y = 11 \Rightarrow x = y + 11$$

$$3x + 10y = -6 \quad \swarrow$$

$$3(y + 11) + 10y = -6$$

$$3y + 33 + 10y = -6$$

$$13y + 33 = -6$$

$$13y = -39$$

$$y = -3$$

$$x - (-3) = 11$$

$$x + 3 = 11$$

$$x = 8$$

$$(8, -3)$$

$$10) \quad -5x + 3y = 11$$

$$x - 2y = 2 \Rightarrow x = 2y + 2$$

$$-5(2y + 2) + 3y = 11$$

$$-10y - 10 + 3y = 11$$

$$-7y - 10 = 11$$

$$-7y = 21$$

$$y = -3$$

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

$$x + 6 = 2$$

$$x = -4$$

$$(-4, -3)$$

$$11) \quad x + 9y = -1 \Rightarrow x = -9y - 1$$

$$2x + 4y = 5$$

$$\left(\frac{7}{2}, -\frac{1}{2}\right)$$

$$2(-9y - 1) + 4y = 5$$

$$-18y - 2 + 4y = 5$$

$$-14y - 2 = 5$$

$$-14y = 7$$

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

$$x + 9\left(-\frac{1}{2}\right) = -1$$

$$x + \frac{-9}{2} = -1$$

$$x = \frac{7}{2}$$

$$8) \quad -4x + y = 4 \Rightarrow y = 4x + 4$$

$$2x + 2y = 13 \quad \swarrow$$

$$2\left(\frac{1}{2}\right) + 2y = 13$$

$$2x + 2(4x + 4) = 13$$

$$1 + 2y = 13$$

$$2x + 8x + 8 = 13$$

$$2y = 12$$

$$10x + 8 = 13$$

$$y = 6$$

$$10x = 5$$

$$x = \frac{1}{2}$$

$$\left(\frac{1}{2}, 6\right)$$