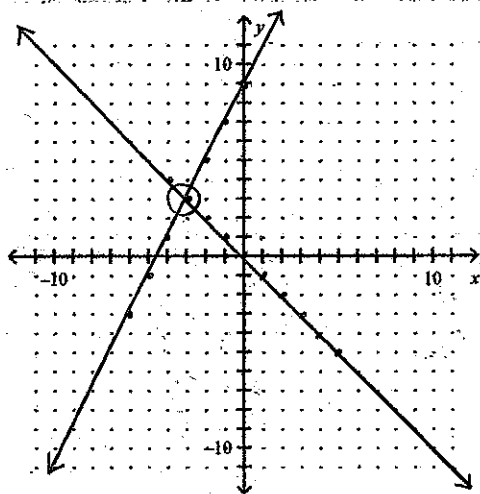


Algebra Prep Practice Quiz "Solving Linear Systems" (You must check your answer for all questions to receive complete credit!)

1. Find the solution to the system by graphing.

$$x + y = 0$$

$$2x - y = -9$$



(-3, 3)

Show work here:

$$\begin{aligned} x + y &= 0 \\ -x &\quad -y \\ \hline y &= -x \end{aligned}$$

$$\begin{aligned} 2x - y &= -9 \\ -2x &\quad -2x \\ \hline -y &= -9 \end{aligned}$$

$$\begin{aligned} -y &= -2x - 9 \\ \frac{-y}{-1} &= \frac{-2x}{-1} - \frac{9}{-1} \\ y &= 2x + 9 \end{aligned}$$

Check:

$$\begin{aligned} -3 + 3 &\stackrel{?}{=} 0 \\ 0 &= 0 \checkmark \\ 2(-3) - 3 &\stackrel{?}{=} -9 \\ -6 - 3 &\stackrel{?}{=} -9 \\ -9 &= -9 \checkmark \end{aligned}$$

2. Solve by substitution:

$$3x + 2y = -4$$

$$y = 4x - 2$$

$$3x + 2(4x - 2) = -4$$

$$3x + 8x - 4 = -4$$

$$11x - 4 = -4$$

$$\frac{11x}{11} = \frac{0}{11}$$

$$x = 0$$

$$y = 4(0) - 2$$

$$y = -2$$

(0, -2)

Check:

$$3(0) + 2(-2) = -4$$

$$-4 = -4 \checkmark$$

$$-2 = 4(0) - 2$$

$$-2 = -2 \checkmark$$

Solve by elimination:

$$\begin{array}{r} 3. \quad 3x + 6y = 9 \\ + \quad x - 6y = 11 \\ \hline 4x = 20 \\ \frac{4}{4} \quad \frac{20}{4} \\ x = 5 \end{array}$$

$$\begin{array}{r} -5 - 6y = 11 \\ -5 - 6y = 11 \\ -6y = 6 \\ \frac{-6y}{-6} = \frac{6}{-6} \\ y = -1 \end{array}$$

$$\begin{array}{r} 3(5) + 6(-1) = 9 \\ 15 - 6 = 9 \\ 9 = 9 \checkmark \\ 5 - 6(-1) = 11 \\ 5 + 6 = 11 \\ 11 = 11 \checkmark \end{array}$$

$(5, -1)$

4. Solve the linear system using elimination:

$$\begin{array}{r} 3x + 2y = -7 \\ -1(x + 2y = -9) \end{array}$$

$$+ \begin{array}{r} 3x + 2y = -7 \\ -x - 2y = 9 \end{array}$$

$$\begin{array}{r} 3(1) + 2y = -7 \\ 3 + 2y = -7 \\ -3 \quad -3 \end{array}$$

Check:

$$\begin{array}{r} 3(1) + 2(-5) = -7 \\ 3 - 10 = -7 \\ -7 = -7 \checkmark \\ 1 + 2(-5) = -9 \\ 1 - 10 = -9 \\ -9 = -9 \checkmark \end{array}$$

$(1, -5)$

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

$$x = 1$$

$$\begin{array}{r} 2y = -10 \\ \frac{2y}{2} = \frac{-10}{2} \\ y = -5 \end{array}$$

Solve the system using any method you choose. Just be sure to show your work and to check your solution:

$$\begin{array}{r} 5. \quad 3x + 4y = -9 \\ -1(3x + y = 0) \end{array}$$

$$+ \begin{array}{r} 3x + 4y = -9 \\ -3x - y = 0 \end{array}$$

$$\begin{array}{r} 3y = -9 \\ \frac{3y}{3} = \frac{-9}{3} \\ y = -3 \end{array}$$

$(1, -3)$

$$3x + -3 = 0$$

$$3x = 3$$

$$x = 1$$

Check:

$$3(1) + 4(-3) = -9$$

$$3 - 12 = -9$$

$$-9 = -9 \checkmark$$

$$3(1) + -3 = 0$$

$$0 = 0 \checkmark$$

6. $y = 3x + 3$
 $y = 2x$

$$\boxed{(-3, -6)}$$

$$\begin{aligned} 3x + 3 &= 2x \\ -3x &\quad -3x \\ \hline 3 &= -x \\ -3 &= x \end{aligned}$$

$$\begin{aligned} y &= 2(-3) \\ y &= -6 \end{aligned}$$

Check:

$$\begin{aligned} -6 &= 3(-3) + 3 \\ -6 &= -9 + 3 \\ -6 &= -6 \checkmark \\ -6 &= 2(-3) \\ -6 &= -6 \checkmark \end{aligned}$$

7. Try to solve this one - it is a little bit different than the other systems you have seen. There will not be one like this on the quiz. You may use any method you would like. Attach a piece of graph paper, if you decide to solve it by graphing.

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

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

$$-8x - 6y = 4$$

$$+ 9x + 6y = -9$$

$$x = -5$$

$$\boxed{(-5, 6)}$$

$$4(-5) + 3y = -2$$

$$\begin{array}{r} -20 + 3y = -2 \\ +20 \quad +20 \end{array}$$

$$\frac{3y}{3} = \frac{18}{3}$$

$$y = 6$$

Check:

$$4(-5) + 3(6) = -2$$

$$-20 + 18 = -2$$

$$-2 = -2 \checkmark$$

$$3(-5) + 2(6) = -3$$

$$-15 + 12 = -3$$

$$-3 = -3 \checkmark$$

8. A rental car agency charges \$15 per day plus 11 cents per mile to rent a certain car. Another agency charges \$18 per day plus 8 cents per mile to rent the same car. How many miles will have to be driven for the cost of a car from the first agency to equal the cost of a car from the second agency? Express the problems as a system of linear equations and solve using the method of your choice. (Be sure to tell me what your variables represent.)

$x = \#$ of miles

$y =$ cost of rental

Agency 1: $y = .11x + 15$

Agency 2: $y = .08x + 18$

The cost for the rentals will be the same at 100 miles. Both rentals will cost \$26.

$$\begin{array}{r} .11x + 15 = .08x + 18 \\ -.08x \quad \quad -.08x \\ \hline .03x + 15 = 18 \\ -15 \quad -15 \\ \hline .03x = 3 \\ \frac{.03x}{.03} = \frac{3}{.03} \\ x = 100 \end{array}$$

$$\begin{array}{l} y = .11(100) + 15 \\ y = 11 + 15 = 26 \\ (100, 26) \end{array}$$

Check:

$$\begin{array}{l} 26 = .11(100) + 15 \\ 26 = 11 + 15 \\ 26 = 26 \checkmark \\ 26 = .08(100) + 18 \\ 26 = 8 + 18 \\ 26 = 26 \checkmark \end{array}$$

9. A group of 52 people attend a ball game. There were three times as many children as adults in the group. Write a system of equations that you could use to solve this problem, where x is the number of adults and y is the number of children in the group. Write and solve a system of equations to find the number of adults and children in the group.

$x = \#$ of adults

$y = \#$ of children

$$x + y = 52$$

$$y = 3x$$

$$x + 3x = 52$$

$$4x = 52$$

$$x = 13$$

$$y = 3(13)$$

$$y = 39$$

There were 13 adults and 39 children at the ball game.

Check:

$$\begin{array}{l} 13 + 39 = 52 \\ 52 = 52 \checkmark \end{array}$$

$$39 = 3(13)$$

$$39 = 39 \checkmark$$