



What Does Cate Often Call Her Twin Sister?



Solve the system of equations using multiplication with the addition method. Then cross out the letter next to the correct answer. When you finish, the answer to the title question will remain.

E	(3, 1)
	(1, -5)
	(2, -3)
	(2, -1)
A	(-2, 4)
	56, 44
T	(4, 0)
	(-2, -5)
C	(1, 4)
	(-1, 1)
I	65, 35
	(0, 2)
L	(5, -2)
	(5, -3)
U	(-1, -3)
	(0, -4)
P	(-2, -2)
	(3, -6)
D	(4, 3)
	(-2, 1)
	72, 28
	(5, 0)

1 $3x + 2y = 11$
 $7x - y = 3$

2 $3x - 4y = 18$
 $x + 3y = -7$

3 $5x + 2y = -8$
 $9x - 4y = -22$

4 $x - 5y = 15$
 $4x - 3y = 26$

5 $2x + 5y = 11$
 $-3x + 8y = -1$

6 $7x - 3y = 2$
 $5x + 4y = -17$

7 $4x - 5y = -28$
 $-9x - 2y = 10$

8 $2x + 3y = 10$
 $3x - 10y = 15$

9 $-7x + 4y = -6$
 $2x - 5y = 21$

10 $8x + 3y = -12$
 $6x + 5y = -20$

11 $-4x - 9y = 1$
 $-x + 2y = -4$

12 $5x - 12y = -16$
 $-3x + 4y = 0$

13 An algebra teacher drove by a farmyard full of chickens and pigs. The teacher happened to notice that there were a total of 100 heads and 270 legs. How many chickens were there? How many pigs were there?

$$\textcircled{1} \quad 3x + 2y = 11$$

$$2[7x - y = 3]$$

$(1, 4)$

$$\Rightarrow + \begin{array}{r} 3x + 2y = 11 \\ 14x - 2y = 6 \\ \hline \end{array}$$

$$\begin{array}{r} 17x = 17 \\ \hline 17 \quad 17 \\ x = 1 \end{array}$$

$$3(1) + 2y = 11$$

$$\begin{array}{r} 3 + 2y = 11 \\ -3 \quad -3 \\ \hline \end{array}$$

$$\begin{array}{r} 2y = 8 \\ \hline 2 \quad 2 \\ y = 4 \end{array}$$

$$\textcircled{2} \quad 3x - 4y = 18$$

$$x + 3y = -7$$

$$\begin{array}{r} + 3y = -7 \\ -3y \quad -3y \\ \hline x = -3y - 7 \end{array}$$

$(2, -3)$

$$3(-3y - 7) - 4y = 18$$

$$-9y - 21 - 4y = 18$$

$$\begin{array}{r} -13y - 21 = 18 \\ +21 \quad +21 \\ \hline \end{array}$$

$$\begin{array}{r} -13y = 39 \\ \hline -13 \quad -13 \\ \hline \end{array}$$

$$y = -3$$

$$x + 3(-3) = -7$$

$$x - 9 = -7$$

$$\begin{array}{r} x - 9 = -7 \\ +9 \quad +9 \\ \hline \end{array}$$

$$x = 2$$

$$\textcircled{3} \begin{cases} 5x + 2y = -8 \\ 9x - 4y = -22 \end{cases} \cdot 2$$

$$(-2, 1)$$

$$\begin{array}{r} \Rightarrow 10x + 4y = -16 \\ + 9x - 4y = -22 \\ \hline 19x = -38 \\ \frac{19x}{19} = \frac{-38}{19} \\ x = -2 \end{array}$$

$$\begin{array}{r} 5(-2) + 2y = -8 \\ -10 + 2y = -8 \\ +10 \quad +10 \\ \hline 2y = 2 \\ \frac{2y}{2} = \frac{2}{2} \\ y = 1 \end{array}$$

$$\textcircled{4} \begin{cases} x - 5y = 15 \\ 4x - 3y = 26 \end{cases}$$

$$\begin{array}{r} x - 5y = 15 \\ + 5y + 5y \\ \hline x = 5y + 15 \end{array}$$

$$(5, -2)$$

$$\begin{array}{r} 4(5y + 15) - 3y = 26 \\ 20y + 60 - 3y = 26 \\ 17y + 60 = 26 \\ -60 \quad -60 \\ \hline 17y = -34 \\ \frac{17y}{17} = \frac{-34}{17} \\ y = -2 \end{array}$$

$$\begin{array}{r} x - 5(-2) = 15 \\ x + 10 = 15 \\ -10 \quad -10 \\ \hline x = 5 \end{array}$$

$$\textcircled{5} \begin{cases} 2x + 5y = 11 \\ -3x + 8y = -1 \end{cases}$$

$$(3, 1)$$

$$\begin{array}{r} 6x + 15y = 33 \\ + \quad -6x + 16y = -2 \\ \hline 31y = 31 \\ \frac{31y}{31} = \frac{31}{31} \\ y = 1 \end{array}$$

$$\begin{array}{r} 2x + 5(1) = 11 \\ 2x + 5 = 11 \\ \quad -5 \quad -5 \\ \hline 2x = 6 \\ \frac{2x}{2} = \frac{6}{2} \\ x = 3 \end{array}$$

$$\textcircled{6} \begin{cases} 7x - 3y = 2 \\ 5x + 4y = -17 \end{cases} \Rightarrow$$

$$(-1, -3)$$

$$\begin{array}{r} 28x - 12y = 8 \\ + \quad 15x + 12y = -51 \\ \hline 43x = -43 \\ \frac{43x}{43} = \frac{-43}{43} \\ x = -1 \end{array}$$

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

$$\textcircled{7} \begin{cases} 4x - 5y = -28 \\ -9x - 2y = 10 \end{cases} \Rightarrow$$

$$(-2, 4)$$

$$\begin{array}{r} 8x - 10y = -56 \\ -45x - 10y = 50 \\ \hline 53x = -106 \\ \frac{53x}{53} = \frac{-106}{53} \end{array}$$

$$x = -2$$

$$\begin{array}{r} 9(-2) - 2y = 10 \\ 18 - 2y = 10 \\ -18 \quad -18 \\ \hline -2y = -8 \\ \frac{-2y}{-2} = \frac{-8}{-2} \\ y = 4 \end{array}$$

$$\textcircled{8} \begin{cases} 2x + 3y = 10 \\ 3x - 10y = 15 \end{cases}$$

$$(5, 0)$$

$$\begin{array}{r} 6x + 9y = 30 \\ -6x + 20y = -30 \\ \hline 29y = 0 \\ \frac{29y}{29} = \frac{0}{29} \end{array}$$

$$y = 0$$

$$\begin{array}{r} 2x + 3(0) = 10 \\ 2x = 10 \\ \frac{2x}{2} = \frac{10}{2} \end{array}$$

$$x = 5$$

$$\textcircled{9} \begin{cases} -7x + 4y = -6 \\ 2x - 5y = 21 \end{cases} \Rightarrow +$$

$$(-2, -5)$$

$$\begin{array}{r} -35x + 20y = -30 \\ 8x - 20y = 84 \\ \hline -27x = 54 \\ \underline{-27} \quad \underline{-27} \\ x = -2 \end{array}$$

$$\begin{array}{r} 2(-2) - 5y = 21 \\ -4 - 5y = 21 \\ +4 \quad \quad +4 \\ \hline -5y = 25 \\ \underline{-5} \quad \underline{-5} \\ y = -5 \end{array}$$

$$\textcircled{10} \begin{cases} 8x + 3y = -12 \\ 6x + 5y = -20 \end{cases} \Rightarrow -$$

$$(0, -4)$$

$$\begin{array}{r} 40x + 15y = -60 \\ 18x + 15y = -60 \\ \hline 22x = 0 \\ \underline{22} \quad \underline{22} \\ x = 0 \end{array}$$

$$\begin{array}{r} 3(0) + 3y = -12 \\ 3y = -12 \\ \underline{3} \quad \underline{3} \\ y = -4 \end{array}$$

$$\begin{aligned} 11 \quad & -4x - 9y = 1 \\ & -x + 2y = -4 \\ & \quad \quad \underline{-2y \quad -2y} \\ & -1 \quad [-x = -2y - 4] \\ & \quad \quad x = 2y + 4 \end{aligned}$$

$$(2, -1)$$

$$\begin{aligned} & -4(2y + 4) - 9y = 1 \\ & -8y - 16 - 9y = 1 \\ & -17y - 16 = 1 \\ & \quad \quad \underline{+16 \quad +16} \\ & \quad \quad -17y = 17 \\ & \quad \quad \underline{-17 \quad -17} \\ & \quad \quad y = -1 \end{aligned}$$

$$\begin{aligned} & -x + 2(-1) = -4 \\ & -x - 2 = -4 \\ & \quad \quad \underline{+2 \quad +2} \\ & \quad \quad -x = -2 \\ & \quad \quad \underline{-1 \quad -1} \\ & \quad \quad x = 2 \end{aligned}$$

$$\begin{aligned} 12 \quad & 5x - 12y = -16 \\ & 3[-3x + 4y = 0] \Rightarrow \end{aligned}$$

$$(4, 3)$$

$$\begin{aligned} & + \quad 5x - 12y = -16 \\ & \quad \quad \underline{-9x + 12y = 0} \\ & \quad \quad -4x = -16 \\ & \quad \quad \underline{-4 \quad -4} \\ & \quad \quad x = 4 \end{aligned}$$

$$\begin{aligned} & -3(4) + 4y = 0 \\ & -12 + 4y = 0 \\ & \quad \quad \underline{+12 \quad +12} \\ & \quad \quad 4y = 12 \\ & \quad \quad \underline{4 \quad 4} \\ & \quad \quad y = 3 \end{aligned}$$

- 13 An algebra teacher drove by a farmyard full of chickens and pigs. The teacher happened to notice that there were a total of 100 heads and 270 legs. How many chickens were there? How many pigs were there?

Let $x = \#$ of chickens

Let $y = \#$ of pigs

$$x + y = 100$$

$$2x + 4y = 270 \Rightarrow 2(100 - y) + 4y = 270$$

$$x + y = 100$$

$$\begin{array}{r} x + y = 100 \\ -y \quad -y \\ \hline \end{array}$$

$$x = 100 - y$$

$$\begin{array}{r} 200 - 2y + 4y = 270 \\ -200 \qquad -200 \\ \hline \end{array}$$

$$\frac{2y}{2} = \frac{70}{2}$$

$$y = 35$$

$$x + 35 = 100$$

$$\begin{array}{r} x + 35 = 100 \\ -35 \quad -35 \\ \hline \end{array}$$

$$x = 65$$

65 chickens
35 pigs