

Graphing Linear Equations, Linear Functions, and Absolute Value Functions

Determine whether the given order pair is a solution to the system:

Textbook Exercises:

2. (-3, 1)

$x - y = -4$

$2x + 10y = 4$

Yes

$x = -3 \quad y = 1$

$-3 - 1 = -4$

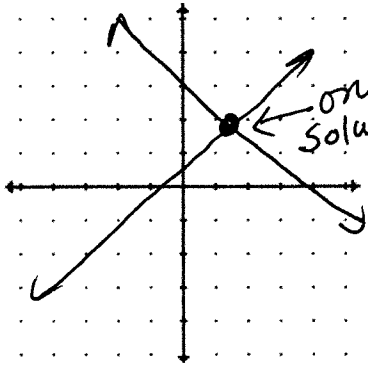
$-4 = -4 \checkmark$

$2(-3) + 10(1) = 4$

$-6 + 10 = 4$

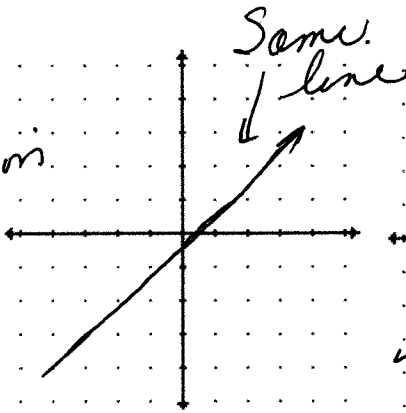
$4 = 4 \checkmark$

Three types of solutions:



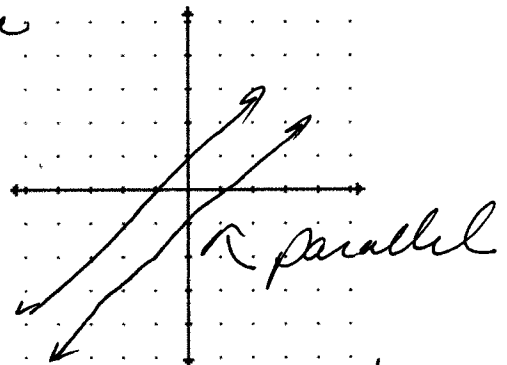
Type: consistent

Number: 1



Type: dependent

Number: Infinite



Type: inconsistent

Number: none

Three Solution Methods:

1. Graphical

2. Substitution

3. Addition

Method 1 - Graphical -- Solve the system graphically

6. ① $x - y = -4$

② $x + y = 6$

① $x - y = -4$

$x = 0 \quad 0 - y = -4$

$y = 4$

$(0, 4)$

$y = 0 \quad x - 0 = -4$

$x = -4$

$(-4, 0)$

② $x + y = 6$

$x = 1$

$1 + y = 6$

$y = 5$

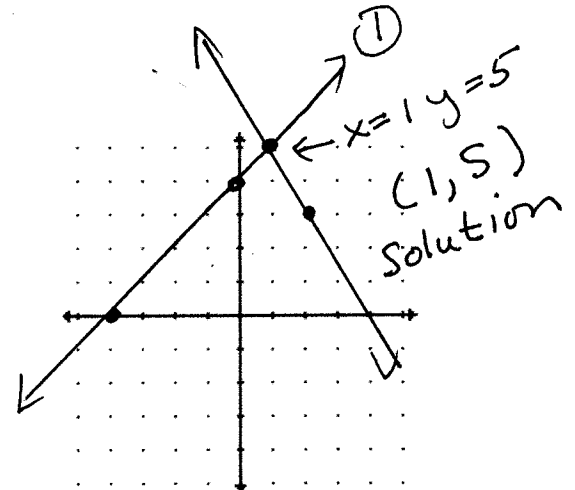
$(1, 5)$

$x = 2$

$2 + y = 6$

$y = 3$

$(2, 3)$



Method 2: Substitution Method

12. $x + y = 10$
 $y = 4x$

$$x + y = 10$$

$$x + 4x = 10$$

$$5x = 10$$

$$x = 2$$

$$y = 4(2) = 8$$

$$\boxed{(2, 8)}$$

$$2 + 8 = 10 \checkmark$$

34. $x - 3y = 3 \Rightarrow x = 3y + 3$
 $3x + 5y = -19$

$$3x + 5y = -19$$

$$3(3y + 3) + 5y = -19$$

$$9y + 9 + 5y = -19$$

$$14y + 9 = -19$$

$$14y = -28$$

$$y = -2$$

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

$$= -6 + 3 = -3$$

$$\boxed{(-3, -2)}$$

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

$$-9 + -10 = -19 \checkmark$$

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Method 3: Addition Method

$$20. \quad \begin{array}{l} 2x + y = 3 \\ x - y = 3 \end{array} \quad \begin{array}{l} \text{add} \\ \text{directly} \end{array}$$

$$3x + 0y = 6$$

$$3x = 6$$

$$x = 2$$

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

$$4 + y = 3$$

$$y = -1$$

$$(2, -1)$$

$$2 - (-1) = 3 \checkmark$$

$$28. \quad \begin{array}{l} 2x - 3y = 2 \\ 5x + 4y = 51 \end{array}$$

eliminate y

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

$$3(5x + 4y) = 3(51)$$

$$\begin{array}{r} 8x - 12y = 8 \\ 15x + 12y = 153 \\ \hline \end{array}$$

$$23x = 161$$

$$x = \frac{161}{23}$$

$$x = 7$$

$$2x - 3y = 2$$

$$2(7) - 3y = 2$$

$$14 - 3y = 2$$

$$-3y = -12$$

$$y = 4$$

$$(7, 4)$$

$$5(7) + 4(4)$$

$$35 + 16 = 51 \checkmark$$