

# Homework

## Systems of Equations with Context Inequalities

### 1-2

Solve by Graphing.

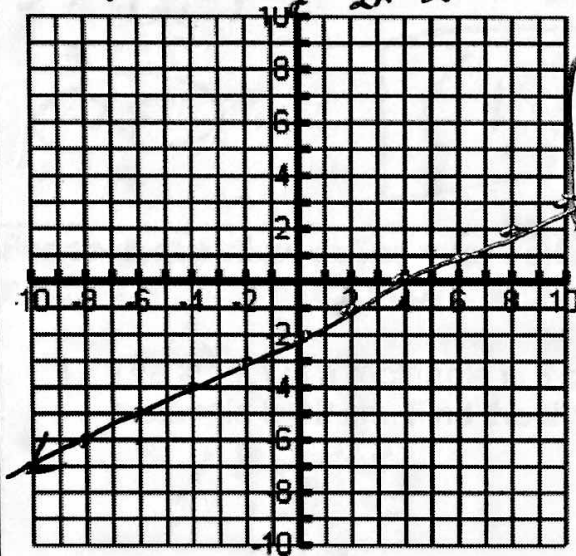
$$3x - 6y = 12$$

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

$$2x - 4y = 8$$

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

Same!



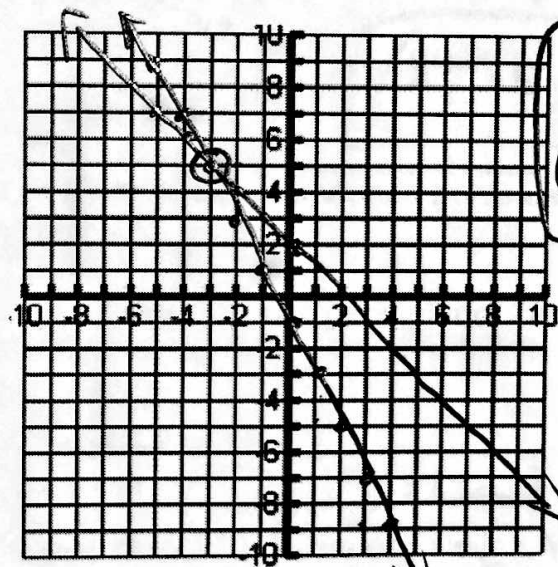
Infinitely many solutions

$$x + y = 2$$

$$y = -x + 2$$

$$y = -2x - 1$$

$$y = -2x - 1$$



Ans: (-3, 5)

**Solve by Substitution.**

$2x - 3y = -1$ $y = x - 1$ $2x - 3(x - 1) = -1$ $2x - 3x + 3 = -1$ $-x = -4$ $x = 4$ $y = (4) - 1$ $y = 3$ <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-top: 10px;">(4, 3)</div>	$y = -3x + 5$ $5x - 4y = -3$ $5x - 4(-3x + 5) = -3$ $5x + 12x - 20 = -3$ $17x = 17$ $x = 1$ $y = -3(1) + 5$ $y = 2$ <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-top: 10px;">(1, 2)</div>
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**Solve by Elimination.**

$\begin{array}{r} (5x + y = 9) \cdot 2 \\ 10x - 7y = -18 \end{array}$ $+ \begin{array}{r} -10x - 2y = -18 \\ 10x - 7y = -18 \end{array}$ <hr style="width: 50%; margin: 5px auto;"/> $-7y = -36$ $y = 4$ $5x + (4) = 9$ $5x = 5$ $x = 1$ <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-top: 10px;">(1, 4)</div>	$\begin{array}{r} (-3x + 7y = -16) \cdot 3 \\ -9x + 5y = 16 \end{array}$ $+ \begin{array}{r} 9x - 21y = 48 \\ -9x + 5y = 16 \end{array}$ <hr style="width: 50%; margin: 5px auto;"/> $-16y = 64$ $y = -4$ $-3x + 7(-4) = -16$ $-3x - 28 = -16$ $-3x = 12$ $x = -4$ <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-top: 10px;">(-4, -4)</div>
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For each question, define your variables, write a system of equations, and solve using any method. Please use a separate sheet of paper to show all work.

1. The length of a rectangle is 3 cm more than twice the width. The perimeter of the rectangle is 42 cm. Find the dimensions of the rectangle.

$L = 2W + 3$   
 $2L + 2W = 42$   
 Subst.

$2(2w + 3) + 2w = 42$   
 $4w + 6 + 2w = 42$   
 $6w + 6 = 42$   
 $6w = 36$   
 $w = 6 \text{ cm } \quad L = 15 \text{ cm}$

2. Suppose you have \$200 in your account and you save \$10 dollars each week. Your friend has \$110 in their account and starts saving \$15 each week. When will your account balances be the same?

$200 + 10w = 110 + 15w$   
 $90 = 5w$   
 $18 = w$

18 weeks!

3. The difference of two numbers is 40. Their sum is 66. Find the numbers.

$$\begin{array}{r} x - y = 40 \\ + x + y = 66 \\ \hline 2x = 106 \end{array}$$

$x = 53$        $y = 13$

4. A youth group and their leaders visited Mammoth Cave. Two adults and 5 students in one van paid \$77. Two adults and 7 students in another van paid \$95. Find the adult price and student price of the tour.

$$\begin{array}{r} 2a + 5s = 77 \\ - (2a + 7s = 95) \\ \hline -2s = -18 \\ s = 9 \end{array}$$

$$\begin{array}{r} 2a + 5(9) = 77 \\ 2a + 45 = 77 \\ 2a = 32 \\ a = 16 \end{array}$$