

Create a linear system to model each of the following situations. Define your variables. Do not solve.

- 1a) The larger of two numbers is three times the smaller number. The sum of the numbers is 60.

$$\begin{aligned} x &= \text{larger \#} & x &= 3y \\ y &= \text{smaller \#} & x + y &= 60 \end{aligned}$$

- b) Jenny determined that the numbers were 15 and 45. Verify that she is correct.

$$45 = 3(15) \checkmark$$

$$45 + 15 = 60 \checkmark$$

- 2a) The perimeter of a rectangle is 40 cm. The length is 4 cm longer than the width.

$$\begin{aligned} w &= \text{width} & 2w + 2l &= 40 \\ l &= \text{length} & l &= 4 + w \end{aligned}$$

- b) Bob determined that length is 10cm and the width is 6cm. Verify that he is correct.

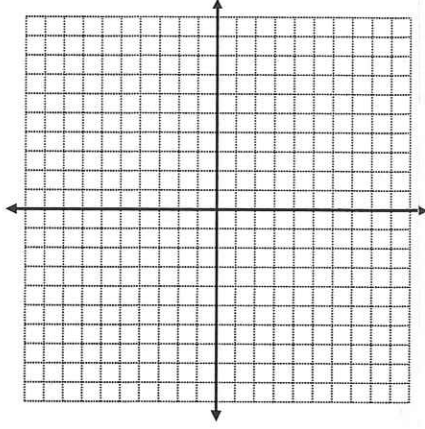
$$2(\underline{6}) + 2(10) = \underline{40} ? \quad X$$

$$10 = 4 + 6 \checkmark$$

Bob is incorrect.

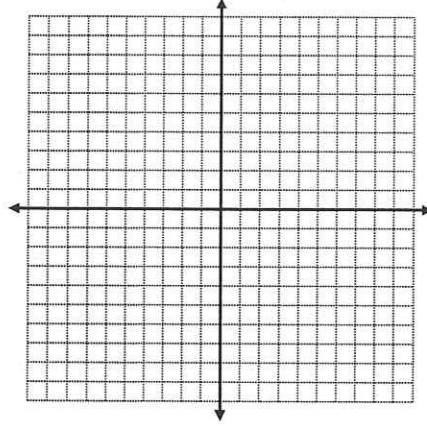
2. Solve each of the following systems by graphing. Clearly label scale and axes.

a)
$$\begin{aligned} y &= \frac{1}{2}x - 3 \\ y &= \frac{3}{2}x - 1 \end{aligned}$$



Solution: $(-2, -4)$

b)
$$\begin{aligned} x + 2y &= -4 \\ 3x - 4y &= -12 \end{aligned}$$



Solution: $(-4, 0)$

3. Solve each of the following systems of equations by substitution.

a) $y = 3x + 13$
 $2x = y - 9$

$(-4, 1)$

b) $x + y = 9$
 $2x + y = 11$

$(2, 7)$

4. Solve each of the following systems of equations by elimination.

a) $x + y = 5$
 $3x - y = 7$

$(3, 2)$

b) $2x + 7y = 33$
 $2x + y = 3$

$(-1, 5)$

c) $5x - 2y = 4$
 $3x + y = 9$

$(2, 3)$

d) $\frac{x}{2} + \frac{y}{3} = 1$
 $\frac{x}{4} - \frac{2y}{3} = -1$

$(\frac{4}{5}, \frac{9}{5})$

5. Define your variables, create a linear system to model the following situation, then solve using the method of your choice:

Alex invested \$100, part at an annual interest rate of 2.5% and the rest at an annual interest rate of 3.5%. After one year, the amount invested at 3.5% had earned \$40 more interest than the amount invested at 2.5%. How much money did Alex invest at each rate?

$\$1291.67$ at 3.5%

$\$208.33$ at 2.5%