

Warm-Up:

1) Simplify  $3x^2 + 4y - z$  if  $x = 2$ ,  $y = -3$ , and  $z = 4$

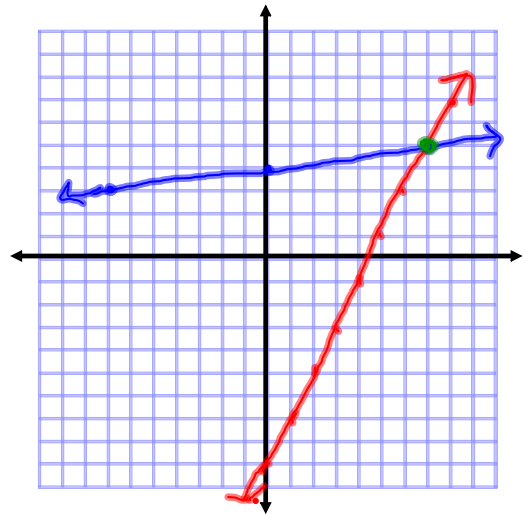
$$3(2)^2 + 4(-3) - 4 = -4$$

12 + -12 - 4

Solve by graphing.

2)  $y = 2x - 9$   
 $y = \frac{1}{7}x + 4$

$$(7, 5)$$



24, 26, 18

18)  $y = \frac{1}{2}x$   
 $2x + y = 10$   
 $-2x \quad -2x$   
 $\hline y = -2x + 10$

24)  $2x + 3y = 4$   
 $-2x \quad -2x$   
 $\frac{3y}{3} = \frac{-2x + 4}{3}$   
 $y = \frac{-2}{3}x + \frac{4}{3}$   
 $-4x - 6y = -8$   
 $+4x \quad +4x$   
 $\hline -6y = 4x - 8$   
 $\frac{-6y}{-6} = \frac{4x - 8}{-6}$   
 $y = \frac{2}{3}x + \frac{4}{3}$

26)  $4x + 3y = 24$   
 $-4x \quad -4x$   
 $\frac{3y}{3} = \frac{-4x + 24}{3}$   
 $y = \frac{-4}{3}x + 8$   
 $5x - 8y = -17$   
 $-5x \quad -5x$   
 $\hline -8y = \frac{-4x + 24}{3} - 17$   
 $\frac{-8y}{-8} = \frac{-4x + 24 - 51}{24}$   
 $y = \frac{4x - 27}{24}$

$4x + 3y = 24$   
 $4(3) + 3(4) = 24$   
 $12 + 12 = 24$   
 $5x - 8y = -17$   
 $5(3) - 8(4) = -17$   
 $15 - 32 = -17$

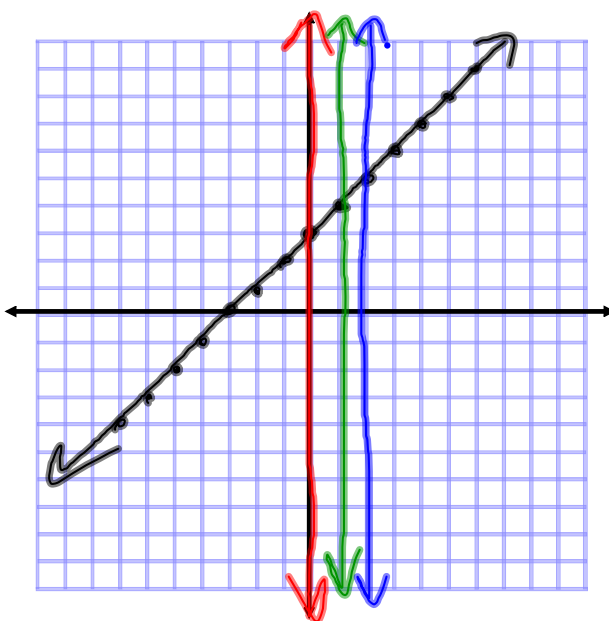
Examples:

Solve.

1)  $y = x + 3$   
 $x = 0$   
 $y = 0 + 3$   
 $y = 3$   
 $(0, 3)$

2)  $y = x + 3$   
 $x = 1$   
 $y = 1 + 3$   
 $y = 4$   
 $(1, 4)$

3)  $y = x + 3$   
 $x = 2$   
 $y = 2 + 3$   
 $y = 5$   
 $(2, 5)$



## Section 5-2: Substitution

Recall: Replacing a variable with an equal expression is **substitution**.

Examples:

4)  $y = 3x$

$y = x + 2$

$$\begin{array}{r} 3x = x + 2 \\ -x \quad -x \\ \hline 2x = 2 \\ \frac{2x}{2} = \frac{2}{2} \quad x = 1 \end{array}$$

$$y = 3(1) \quad y = 1 + 2$$

$$y = 3$$

$$(1, 3)$$

5)  $y = 3x$

$x = y + 2$

$$\begin{array}{r} x = 3x + 2 \\ -3x \quad -3x \\ \hline -2x = 2 \\ \frac{-2x}{-2} = \frac{2}{-2} \\ x = -1 \end{array}$$

$$y = 3(-1) \\ y = -3$$

$$(-1, -3)$$

Examples:

6)  $x = 4y$

$4x - y = 75$

$$\begin{array}{r} 4(4y) - y = 75 \\ 16y - y = 75 \\ \frac{15y}{15} = \frac{75}{15} \quad y = 5 \end{array}$$

$$x = 4(5) \\ x = 20$$

$$(20, 5)$$

7)  $4x + y = 12$

$-2x - 3y = 14$

$$\begin{array}{r} 4x + y = 12 \\ -4x \quad -4x \\ \hline y = -4x + 12 \end{array}$$

$$x = 5$$

$$y = -4(5) + 12$$

$$y = -20 + 12$$

$$y = -8$$

$$(5, -8)$$

$$-2x - 3(-4x + 12) = 14$$

$$-2x + 12x - 36 = 14$$

$$10x - 36 = 14$$

$$+36 \quad +36$$

$$\begin{array}{r} 10x = 50 \\ \frac{10x}{10} = \frac{50}{10} \\ x = 5 \end{array}$$

Examples:

$$8) \quad 2x + 2y = 8$$

$$x + y = -2$$

$$\begin{array}{r} -x \quad -x \\ \hline \end{array}$$

$$y = -x - 2$$

$$2x + 2(-x - 2) = 8$$

$$2x - 2x - 4 = 8$$

$$-4 \neq 8$$

No  
Solution

Examples:

9) Gold is alloyed with different metals to make it hard enough to be used in jewelry. The amount of gold present in a gold alloy is measured in 24ths called *karats*. 24-karat gold is 24/24 or 100% gold. Similarly, 18-karat gold is 18/24 or 75% of gold. How many ounces of 18-karat gold should be added to an amount of 12-karat gold to make 4 ounces of 14-karat gold?

Homework: pg. 263 #8-18 even, 24, 26-28 all, 35-37 all

Section 5-2 Vocab