

# Unit 5 Test Review

Name: Key

Solve the following systems of equations by graphing.

1.  $2x + y = -4$   
 $x + 4y = 12$

$$\frac{4y}{4} = \frac{-x+12}{4}$$

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

Check your solution:  $(-4, 4)$

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

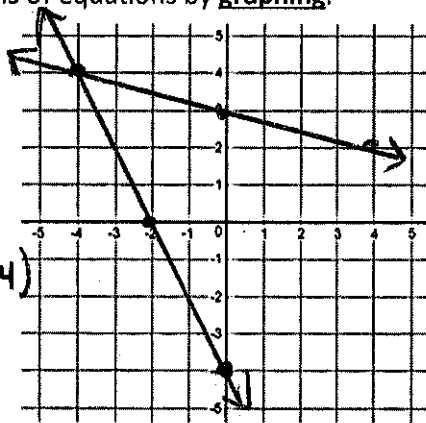
$$-8 + 4 = -4$$

$$-4 = -4 \checkmark$$

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

$$-4 + 16 = 12$$

$$12 = 12 \checkmark$$



2.  $y = 3x + 3$   
 $y = x^2 + 3x + 2$

x	y
1	6
-1	0
-2	0
-1.5	-2.25

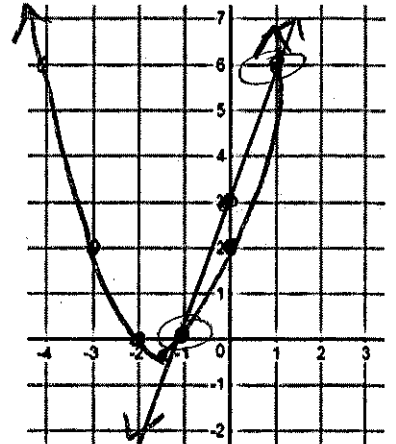
Check your solution:  
 $(1, 6)$   $(-1, 0)$

$$6 = 3(1) + 3$$

$$6 = 6 \checkmark$$

$$6 = 1^2 + 3(1) + 2$$

$$6 = 6 \checkmark$$



$$0 = 3(-1) + 3$$

$$0 = 0 \checkmark$$

$$0 = (-1)^2 + 3(-1) + 2$$

$$0 = 1 - 3 + 2$$

$$0 = 0 \checkmark$$

3. Explain in words: How can you find a solution to a system of equations from a graph?

The solution can be seen in the intersection(s) of the graphs of the functions.

4. Solve the following system using the substitution method:  $y = 2x - 10$   
 $y = 4x - 8$

$$2x - 10 = 4x - 8$$

$$-4x + 10 = 4x + 10$$

$$-2x = 2$$

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

$$x = -1$$

$$y = 2(-1) - 10$$

$$y = -2 - 10$$

$$y = -12$$

$(-1, -12)$

5. Solve the following system using the elimination method:  $(8x + 3y = 13) \cdot 2 \rightarrow 16x + 6y = 26$   
 $(3x + 2y = 11) \cdot 3 \rightarrow 9x + 6y = 33$

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

$$-3 + 2y = 11$$

$$+3 \quad +3$$

$$\frac{2y}{2} = \frac{14}{2}$$

$$y = 7$$

$$\frac{7x}{7} = \frac{-7}{7}$$

$$x = -1$$

6. Solve the following system algebraically:  $y = x^2 - 81$   
 $y = 18x - 161$

$$x^2 - 81 = 18x - 161$$

$$-18x + 161 = -18x + 161$$

$$x^2 - 18x + 80 = 0 \rightarrow a=1, b=-18, c=80$$

$$(x-10)(x-8) = 0$$

$$x-10=0 \rightarrow x=10$$

$$x-8=0 \rightarrow x=8$$

$$y = 10^2 - 81 = 100 - 81 = 19$$

$$y = 8^2 - 81 = 64 - 81 = -17$$

$$x = \frac{-18 \pm \sqrt{(-18)^2 - 4 \cdot 1 \cdot 80}}{2 \cdot 1}$$

$$= \frac{-18 \pm \sqrt{324 - 320}}{2}$$

$$= \frac{-18 \pm \sqrt{4}}{2} \rightarrow \frac{-18+2}{2} = -8, \frac{-18-2}{2} = -10$$

7. Fill out the table for each of the following equations below:

a.  $y = 6x - 11$

$2x + 3y = 7$

x	y
-3	-29
-2	-23
-1	-17
0	-11
1	-5
2	1
3	7

x	y
-3	$4\frac{1}{3}$
-2	$3\frac{2}{3}$
-1	3
0	$2\frac{1}{3}$
1	$1\frac{2}{3}$
2	1
3	$\frac{1}{3}$

b. Use the tables to find the solution to the system of equations:

$$\begin{array}{r}
 y = 6x - 11 \\
 2x + 3y = 7 \\
 \underline{-2x} \qquad \underline{-2x} \\
 3y = -2x + 7 \\
 \frac{3y}{3} = \frac{-2x + 7}{3} \quad y = -\frac{2}{3}x + \frac{7}{3}
 \end{array}$$

(2, 1)

c. Explain in words how you used the table to find your answer in part b.

I saw where the tables gave identical x and y values

9. Kona coffee sells for \$51 per pound and Colombian coffee sells for \$11 per pound. Sylvia wants to mix these two types of coffee to create 100 pounds of Breakfast Blend coffee that will sell for \$25 per pound.

a. How much would the 100 pound mix cost?

$$\$25 \times 100 = 2500$$

b. Write a system of equations that would describe this situation.

$$\begin{array}{l}
 k + c = 100 \\
 51k + 11c = 2500
 \end{array}$$

c. Solve the system algebraically (substitution or elimination).

$$\begin{array}{r}
 k = 100 - c \\
 51(100 - c) + 11c = 2500 \\
 5100 - 51c + 11c = 2500 \\
 \underline{-5100} \qquad \underline{-5100} \\
 -40c = 2600 \\
 c = 65
 \end{array}$$

$$\begin{array}{r}
 k + 65 = 100 \\
 \underline{-65} \quad \underline{-65} \\
 k = 35
 \end{array}$$

65 lb of Colombian  
35 lb of Kona

8. A metallurgist (someone who mixes metals) needs to make 50 pounds of an alloy (metal mixture) containing 50% gold. He is going to melt and combine one metal that is 20% gold with another metal that is 70% gold. How much of each should he use?

a. How much would the 100 pound mix cost?  
How many pounds of gold would

$$50 \times (0.5) = 25 \text{ lb}$$

b. Write a system of equations that would describe this situation.

$$\begin{array}{l}
 0.2x + 0.7y = 25 \\
 x + y = 50
 \end{array}$$

c. Solve the system algebraically.

$$\begin{array}{r}
 x = 50 - y \\
 0.2(50 - y) + 0.7y = 25 \\
 10 - 0.2y + 0.7y = 25 \\
 \underline{-10} \qquad \underline{-10} \\
 0.5y = 15 \\
 \frac{0.5y}{0.5} = \frac{15}{0.5} \\
 y = 30
 \end{array}$$

20 lb of 20% gold  
30 lb of 70% gold