

Name: \_\_\_\_\_  
 Date: \_\_\_\_\_  
 Class: \_\_\_\_\_

Algebra  
 Unit 8  
 HW 8-3

1) Solve the following system algebraically

$$y = 2x^2 - 2x + 1 \quad \text{and} \quad y = 4x + 1$$

$$\begin{array}{r} 2x^2 - 2x + 1 = 4x + 1 \\ -4x - 1 \quad -4x - 1 \\ \hline \end{array}$$

GCF = 2x

$$\begin{array}{r} 2x^2 - 6x = 0 \\ \frac{2x^2}{2x} \quad \frac{-6x}{2x} \\ \hline \end{array}$$

$$2x(x-3) = 0$$

$$\begin{array}{l} 2x = 0 \quad x - 3 = 0 \\ \underline{x = 0} \quad \underline{x = 3} \end{array}$$

$$y = 4(0) + 1$$

$$\boxed{(0, 1)}$$

$$y = 4(3) + 1$$

$$\boxed{(3, 13)}$$

2) Solve the following system algebraically:

$$y = 2x^2 + 5x + 3 \quad \text{and} \quad y = x^2 + 9x + 15$$

$$\begin{array}{r} 2x^2 + 5x + 3 = x^2 + 9x + 15 \\ -x^2 - 9x - 15 \quad -x^2 - 9x - 15 \\ \hline \end{array}$$

$$\begin{array}{l} x^2 - 4x - 12 = 0 \\ (x-6)(x+2) = 0 \end{array}$$

$$\begin{array}{l} x - 6 = 0 \quad x + 2 = 0 \\ \underline{x = 6} \quad \underline{x = -2} \end{array}$$

$$y = (-2)^2 + 9(-2) + 15$$

$$\boxed{(-2, 1)}$$

$$y = (6)^2 + 9(6) + 15$$

$$\boxed{(6, 105)}$$

3) Solve:  $16x = 20 - 21x^2$

$$21x^2 + 16x - 20 = 0$$

$$21x^2 + 16x - 20 = 0 \quad (3x-2)(7x+10)$$

$$\begin{array}{l} x^2 + 16x - 420 = 0 \\ (x - \frac{14}{3})(x + \frac{30}{7}) \\ \underline{x = \frac{2}{3}} \quad \underline{x = -\frac{7}{10}} \end{array}$$

4) For which x will  $f(x) = 0$ :  $f(x) = x^3 + 24x^2 - 180x$

$$0 = x^3 + 24x^2 - 180x$$

$$\begin{array}{l} \text{GCF} \rightarrow x \\ 0 = x(x^2 + 24x - 180) \end{array}$$

$$0 = x(x-6)(x+30)$$

$$\begin{array}{l} \underline{x = 0} \quad \underline{x - 6 = 0} \quad \underline{x + 30 = 0} \\ \underline{x = 6} \quad \underline{x = -30} \end{array}$$

5) If  $f(x) = x^2 - 6x + 7$  and  $g(x) = x - 3$ , find all points where  $f(x) = g(x)$

$$\begin{array}{r} x^2 - 6x + 7 = x - 3 \\ -x + 3 \quad -x + 3 \\ \hline \end{array}$$

$$x^2 - 7x + 10 = 0$$

$$(x-5)(x-2) = 0$$

$$\underline{x=5} \quad \underline{x=2}$$

$$g(2) = 2 - 3$$

$$g(2) = -1$$

$$\boxed{(2, -1)}$$

$$g(5) = 5 - 2$$

$$g(5) = 3$$

$$\boxed{(5, 3)}$$

6) If  $f(x) = 4x + 6$ ,  $g(x) = x^2 + 25x + 144$ , and  $h(x) = 6x + 20$ , find any  $x$  values that will solve the following:  $g(x) = f(x) + h(x)$ ,  $f(x) - h(x)$

$$x^2 + 25x + 144 = 4x + 6 + (6x + 20)$$

$$x^2 + 25x + 144 = \cancel{10x + 26} + 4x + 6 - 6x - 20$$

$$\begin{array}{r} +2x + 16 \quad \cancel{10x + 26} \quad -2x - 26 \\ \hline \end{array}$$

$$x^2 + 27x + 170 = 0$$

$$\begin{array}{r} x^2 + 27x + 170 = 0 \\ (x+14)(x+17) = 0 \\ x+14=0 \quad x+17=0 \\ \boxed{x=-14 \quad x=-17} \end{array}$$

7) Solve:  $12x^2 - 75 = -80x$

$$\begin{array}{r} +80x \quad +80x \\ \hline 12x^2 + 80x - 75 = 0 \\ x^2 + 80x - 900 = 0 \\ (x + \frac{900}{12})(x - \frac{900}{12}) \\ \sqrt{2} \quad \sqrt{6} \end{array}$$

$$(2x+15)(6x-5) = 0$$

$$\begin{array}{r} 2x+15=0 \quad 6x-5=0 \\ \underline{x=-7.5} \quad \underline{x=\frac{5}{6}} \end{array}$$

8) Solve:  $2x^3 - 12x^2 = 560x$

$$\begin{array}{r} -560x \quad -560x \\ \hline \end{array}$$

$$\text{GCF } 2x \quad \frac{2x^3}{2x} - \frac{12x^2}{2x} - \frac{560x}{2x} = 0$$

$$2x(x^2 - 6x - 280) = 0$$

$$2x(x-20)(x+14) = 0$$

$$\begin{array}{r} 2x=0 \quad x-20=0 \quad x+14=0 \\ \underline{x=0} \quad \underline{x=20} \quad \underline{x=-14} \end{array}$$