

## 9.4 – 9.5 Factoring Quadratic Equations Study Guide Questions

### 9.4: Factor Using the GCF –

You should be able to:

1. Identify the GCF of a quadratic expression and factor using this method.

**Ex:**  $2x^2 - 4x$  becomes  $\boxed{2x(x-2)}$  when factored. The circled portion would be your answer.

**Factor using the GCF:**

**Ex:**  $-4y + 16y^2$

**Ex:**  $3xy + 8xy^2$

2. Solve a quadratic equation in factored form.

**Ex:**  $(3x-1)(x+2) = 0$ , since you are multiplying two quantities and the answer is 0, then one of the two quantities being multiplied must be equal to zero. This means either  $3x-1 = 0$  or  $x+2 = 0$

If:  $3x-1 = 0$  you would:

$$\begin{array}{r} +1 \quad +1 \\ \hline 3x = 1 \\ \frac{3}{3} \quad \frac{1}{3} \end{array} \text{ first add 1 to both sides}$$

then divide by three so:

$$\boxed{x = \frac{1}{3}}$$

If:  $x+2 = 0$  you would:

$$\begin{array}{r} x + 2 = 0 \\ \hline -2 \quad -2 \text{ subtract 2 so:} \\ \hline \boxed{x = -2} \end{array}$$

**Solve:**

**Ex:**  $x(2x-5) = 0$

**Ex:**  $x(3x-7)(4x-1) = 0$

3. Solve a quadratic equation by factoring using the GCF first!

**Ex:**  $7x^2 + 21x = 0$

$7x(x+3) = 0$  Factor using GCF of  $7x$

So either  $7x = 0$  or  $x + 3 = 0$   
 $\boxed{x = 0}$  or  $\boxed{x = -3}$

**Solve:**

**Ex:**  $8x^2 - 16x = 0$

**Ex:**  $2x^2 = -7x$

4. Use the vertical motion model to solve problems involving a problem's height and time. (

$$h = -16t^2 + vt + s)$$

**Ex:** An object is launched from the ground with an initial vertical velocity of 32 feet per second. How long before the object reaches the ground?

### 9.5: Factor Quadratics in the Form $x^2 + bx + c$ :

**You should be able to:**

1. Factor trinomials in the form  $x^2 + bx + c$  by factoring into two binomials in the form:

$$(x + p)(x + q)$$

\*To find  $p$  and  $q$  you find the factors of  $c$  that add up to  $b$ .

**Ex:**  $x^2 - 7x + 12$  becomes  $(x - 3)(x - 4)$  when factored because  $-4$  and  $-3$  first multiply to get  $+12$ , but also add up to  $-7$ .

**Factor:**

**Ex.**  $x^2 - 2x - 24$

**Ex:**  $-x^2 - 9x - 18$

**Ex:**  $3x^2 + 9x + 6$

2. Solve quadratic equations by factoring first.

**Ex:**  $x^2 - 7x + 12 = 0$  Factor first

$$(x - 3)(x - 4) = 0 \quad \text{Solve}$$

$$\boxed{x = 3} \text{ or } \boxed{x = 4}$$

**Ex:**  $x^2 - 17x + 60 = 0$

**Ex:**  $x^2 + 8x = -12$

3. Use the vertical motion model to solve problems involving a problem's height and time. ( $h = -16t^2 + vt + s$ )

**Ex:** An object is launched from a height of 48 feet with an initial vertical velocity of 32 feet per second. How long before the object reaches the ground?

4. Find the missing dimension of a rectangle given the area by factoring.

**Ex:** Area: 100 square inches

