

# Ch 10.5

## Factoring to Solve Quadratic Equations



# Solving Quadratic Equations

Quadratic Equation- an equation written in the form  
 $ax^2 + bx + c = 0$ ,  $a \neq 0$ .

## Using the Zero-Product Property to Solve Quadratics

**Property:** For every real #  $a$  &  $b$ , if  $ab = 0$  then  $a = 0$  or  $b = 0$ .

Example: If  $(x+4)(x+6) = 0$ , then  $x + 4 = 0$  or  $x + 6 = 0$

- Set each factor = 0 and solve.

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

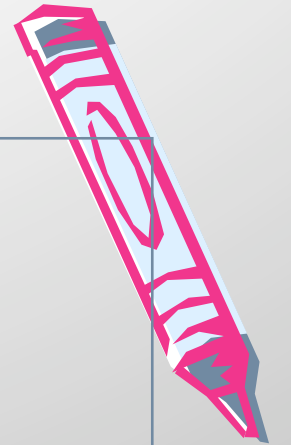
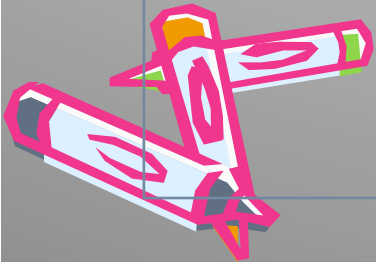
$$x + 7 = 0 \text{ or } x - 4 = 0$$

$$x = -7 \quad \text{or} \quad x = 4$$

Ex 2:  $(3y - 5)(y - 2) = 0$

$$3y - 5 = 0 \text{ or } y - 2 = 0$$

$$y = \frac{5}{3} \quad \text{or} \quad y = 2$$



# Try some

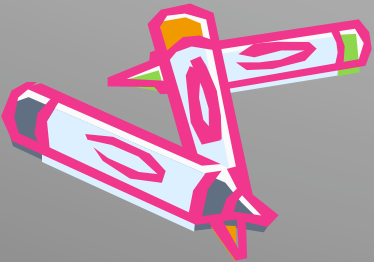
Solve.

$$1. (2x + 3)(x - 4) = 0$$

$$2. (4p + 3)(p - 6) = 0$$

$$3. (3y + 2)(y + 10) = 0$$

$$4. (6k - 9)(4k - 11) = 0$$



# Solving by Factoring

You can solve equations using the Zero-Product Property if the expression  $ax^2 + bx + c$  can be factored.

- Make sure equation is in standard form, then factor.
- Set each factor = 0 and solve.

Ex 1:  $w^2 - 16w = 0$        $w(w-16) = 0$

$$w = 0 \text{ or } w - 16 = 0$$

$$w = 0 \text{ or } w = 16$$

Ex 2:  $x^2 + x - 12 = 0$

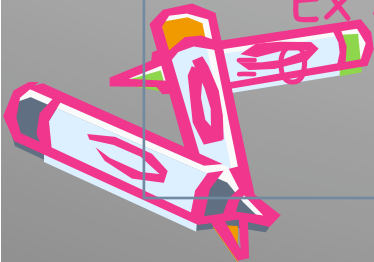
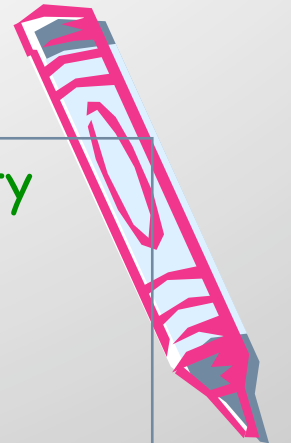
$$(x + 4)(x - 3) = 0 \quad x + 4 = 0 \text{ or } x - 3 = 0$$

$$x = -4 \quad \text{or} \quad x = 3$$

Ex 3:  $x^2 - 12x = -36$       rewrite:  $x^2 - 12x + 36$

$$(x - 6)(x - 6) = 0 \quad x - 6 = 0 \text{ or } x - 6 = 0$$

$$x = 6$$



# Try some

Solve by Factoring.

1.  $6p^2 + 2p = 0$

2.  $x^2 + x - 42 = 0$

3.  $4y^2 - 25 = 0$

4.  $a^2 - 5a = 6$

5.  $12x + 4 = -9x^2$

