Bell Ringer   Solve the equation; leave in simplified radical form.

$$-3x^2 + 16 = -38$$

Bell Ringer   Solve the equation; leave in simplified radical form.

$$-3x^2 + 16 = -38$$

$$-3x^2 = -54$$

$$x^2 = 18$$

$$x = \pm\sqrt{18}$$

$$x = \pm 3\sqrt{2}$$

Chapter 10-7 Notes: Factoring Special Types of Quadratics

If "a" and "c" terms are perfect squares, then three special patterns exist:

1) Difference of Two Squares: $a^2 - c^2$ factors to $(a + c)(a - c)$
   Example: $m^2 - 4$ factors to $(m + 2)(m - 2)$

2) Perfect Square Trinomial Addition: $a^2 + 2ac + c^2$ factors to $(a + c)^2$
   Example: $16y^2 + 24y + 9$ factors to $(4y + 3)^2$

3) Perfect Square Trinomial Subtraction: $a^2 - 2ac + c^2$ factors to $(a - c)^2$
   Example: $4x^2 - 4x + 1$ factors to $(2x - 1)^2$

May need to factor out the GCF to identify the pattern.

Remember: When solving quadratics by factoring, you try to find the value of "x" that makes the equation equal zero. Factoring is a method of finding solutions; it is not the solutions.

Identify and state the pattern, factor, and then solve the equation.

1) $x^2 - 9 = 0$

Difference of Two Squares $(a+c)(a-c)$

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

$$x = -3 \text{ and } 3$$

2) $49x^2 - 81 = 0$

Difference of Two Squares $(a+c)(a-c)$

$$(7x+9)(7x-9)=0$$

$$x = -\frac{9}{7} \text{ and } \frac{9}{7}$$

Identify and state the pattern, factor, and then solve the equation.

3) $9y^2 + 60y + 100 = 0$

Perfect Square Trinomial Addition $(a+c)^2$

why? b term = $2ac$ = $2(3)(10)$ = 60

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

$$y = \frac{-10}{3}$$

Identify and state the **pattern**, factor, and then solve the equation.

4) $2x^2 - 12x + 18 = 0$

Perfect Square Trinomial Subtraction

$2(x^2 - 6x + 9)$ Why? $^-2ac = ^-2(1)(3) = -6$

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

$x = 3$

Identify and state the pattern, factor, and then solve the equation.

5) $36x^2 - 144 = 0$

Identify and state the pattern, factor, and then solve the equation.

5) $36x^2 - 144 = 0$ Difference of Two Squares

$$(6x + 12)(6x - 12) = 0$$

or

$$36(x + 2)(x - 2) = 0$$

$$x = -2 \text{ and } 2$$

Identify and state the pattern, factor, and then solve the equation.

6) $4x^2 + 24x + 36 = 0$

Identify and state the pattern, factor, and then solve the equation.

6) $4x^2 + 24x + 36 = 0$

Perfect Square Trinomial Addition

$4(x^2 + 6x + 9) = 0$

$4(x + 3)^2 = 0$

$x = {}^-3$

Identify and state the pattern, factor, and then solve the equation.

7) $\frac{1}{3}x^2 - 6x + 27 = 0$

Identify and state the pattern, factor, and then solve the equation.

7) $1/3x^2 - 6x + 27 = 0$

Perfect Square Trinomial Subtraction

Factor out $\frac{1}{3}$

$$\frac{1}{3}(x^2 - 18x + 81) = 0$$

$$\frac{1}{3}(x-9)^2 = 0$$

$$x = 9$$

Identify and state the pattern, factor, and then solve the equation.

8) $98 - 2x^2 = 0$

Identify and state the pattern, factor, and then solve the equation.

8) $98 - 2x^2 = 0$ Difference of Two Squares

$-2x^2 + 98 = 0$

Factor out -2

$-2(x^2 - 49) = 0$

$-2(x+7)(x-7) = 0$

$x = -7 \text{ and } 7$