## Do Now:

Simplify and state the answer in simplest radical form and in decimal form (round answer to the nearest hundredth).

$$\frac{2 + 3\sqrt{7}}{2}$$

$$\frac{1 + 3\sqrt{7}}{2} = 4.468626967$$

Simplest radical Form $\dfrac{1 + 3\sqrt{7}}{2}$

Decimal Form $4.47$

## AIM: SOLVING QUADRATIC EQUATIONS USING THE QUADRATIC FORMULA (Day 2)

**Directions:** Find the roots of the following quadratic equations and express the answers in simplest radical form and decimals rounded to the nearest tenth.

1) $x^2 - 4x = 6$

$$\underline{-6 \quad -6}$$

$$x^2 - 4x - 6 = 0$$

$a = 1$
$b = -4$
$c = -6$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(-6)}}{2(1)}$$

$$x = \frac{4 \pm \sqrt{16 + 24}}{2}$$

$$x = \frac{4 \pm \sqrt{40}}{2}$$

$$x = \frac{4 \pm \sqrt{4}\sqrt{10}}{2}$$

$$x = \frac{4 \pm 2\sqrt{10}}{2}$$

Decimal form

radical $2 \pm \sqrt{10}$

Simplest radical form $5.2, -1.2$

decimal

2) $x^2 - 8 = 0$

$a = 1$
$b = 0$
$c = -8$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(0) \pm \sqrt{(0)^2 - 4(1)(-8)}}{2(1)}$$

$$x = \frac{0 \pm \sqrt{0 + 32}}{2}$$

$$x = \frac{\pm \sqrt{32}}{2}$$

$$x = \frac{\pm \sqrt{16}\sqrt{2}}{2}$$

$$x = \frac{\pm 4\sqrt{2}}{2}$$

Decimal form $\pm 2\sqrt{2}$

radical

Simplest radical form $2.8, -2.8$

3) $x^2 - 10x = 25$

$\dfrac{-25 \quad -25}{x^2 - 10x - 25 = 0}$

$\underset{a}{x^2} \ \underset{b}{-10x} \ \underset{c}{-25}$

$a = 1$
$b = -10$
$c = -25$

$x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$x = \dfrac{-(-10) \pm \sqrt{(-10)^2 - 4(1)(-25)}}{2(1)}$

$x = \dfrac{10 \pm \sqrt{100 + 100}}{2}$

$x = \dfrac{10 \pm \sqrt{200}}{2}$

$x = \dfrac{10 \pm \sqrt{100}\sqrt{2}}{2}$

$x = \dfrac{\cancel{10} \pm \cancel{10}\sqrt{2}}{\cancel{2}}$

Decimal form _____

radical $5 \pm 5\sqrt{2}$

Simplest radical form $12.1, -7.1$

Decimal

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4) $x^2 + 2x = 1$

$\dfrac{+2x + 2x}{}$

$x^2 + 2x = 1$
$\dfrac{-1 \qquad -1}{}$

$\underset{a}{x^2} + \underset{b}{2x} \underset{c}{-1} = 0$

$b = 2$
$c = -1$

$x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$x = \dfrac{-(2) \pm \sqrt{(2)^2 - 4(1)(-1)}}{2(1)}$

$x = \dfrac{-2 \pm \sqrt{4 + 4}}{2}$

$x = \dfrac{-2 \pm \sqrt{8}}{2}$

$x = \dfrac{-2 \pm \sqrt{4}\sqrt{2}}{2}$

$x = \dfrac{\cancel{-2} \pm \cancel{2}\sqrt{2}}{\cancel{2}}$

Decimal form _____

radical $-1 \pm \sqrt{2}$

Simplest radical form $.4, -2.4$

Decimal

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EXIT CARD: Complete problem on looseleaf.

5) $x^2 = -6x + 2$

$\dfrac{+6x \quad +6x}{x^2 + 6x = 2}$

$x^2 + 6x + \underline{9} = 2 + \underline{9}$

$x^2 + 6x + 9 = 11$

$(x + 3)(x + 3) = 11$

$\sqrt{(x+3)^2} = \sqrt{11}$

$x + 3 = \pm\sqrt{11}$
$\quad -3 \qquad\quad -3$

$\boxed{x = -3 \pm \sqrt{11}}$

$\boxed{\{.3, -6.3\}}$