Name: KEY Hour: _____ Date: _____

NOTES: Section 9.2 – Solving Quadratic Equations by Finding Square Roots.

Goals: #1 - I can solve a quadratic equation by finding square roots. 

Homework: Section 9.2 Worksheet

Warm Up: Evaluate the expression. Give the exact value if possible. Otherwise, approximate to the nearest hundredth.

1. $-\sqrt{81}$

$\boxed{-9}$

2. $8 \pm \sqrt{8}$

8 ± 2.83

$8+2.83$ $\quad$ $8-2.83$

$\boxed{10.83}$ $\quad$ $\boxed{5.17}$

3. $\frac{7 \pm 3\sqrt{12}}{-6}$

$\frac{7 \pm 10.38}{-6}$

$\frac{7+10.38}{-6}$ $\quad$ $\frac{7-10.38}{-6}$

$\boxed{-2.89}$ $\quad$ $\boxed{0.56}$

Exploration #1: Work with a partner and answer the following questions.

1. What is the *inverse operation* of squaring a number?

square rooting a number

2. What is the difference between an *expression* and an *equation*?

$\sqrt{16}$ ↑ expression

$\sqrt{16} = x$ ↑ equation (equal sign)

3. Solve: $x^2 = 16$

$\boxed{4, -4}$ ↖ what #^{2} = 16?

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Notes:

A quadratic equation is an equation that can be written in the standard form:

$$ax^2 + bx + c = 0$$

There are various methods to solve quadratic equations. Let's took a look at one method!

Example #1: Solve the equation. Write the solutions as integers if possible. Otherise, write them as a radical expression.

1. $x^2 = 4$

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

$\boxed{x = \pm 2}$

2. $n^2 = 5$

$\sqrt{n^2} = \pm\sqrt{5}$

$\boxed{n = \pm\sqrt{5}}$

You practice: Solve the equation. Write the solutions as integers if possible. Otherise, write them as a radical expression.

1. $x^2 = 81$

$\sqrt{x^2} = \pm\sqrt{81}$

$\boxed{x = \pm 9}$

2. $n^2 = 10$

$\sqrt{n^2} = \pm\sqrt{10}$

$\boxed{n = \pm\sqrt{10}}$

3. $x^2 = 0$

$\sqrt{x^2} = \pm\sqrt{0}$

$\boxed{x = 0}$

4. $y^2 = -1$

$\sqrt{y^2} = \pm\sqrt{-1}$

$\boxed{\text{no real solution}}$

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Example #2: Solve the equation.

1. $3x^2 - 48 = 0$

$+48 \quad +48$

$\frac{3x^2}{3} = \frac{48}{3}$

$x^2 = 16$

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

$\boxed{x = \pm 4}$

2. $27 - 3y^2 = 0$

$-27 \quad -27$

$\frac{-3y^2}{-3} = \frac{-27}{-3}$

$y^2 = 9$

$\sqrt{y^2} = \pm\sqrt{9}$

$\boxed{y = \pm 3}$

You practice: Solve the equation.

1. $6x^2 - 150 = 0$

$+150 \quad +150$

$\frac{6x^2}{6} = \frac{150}{6}$

$x^2 = 25$

$\sqrt{x^2} = \pm\sqrt{25}$

$\boxed{x = \pm 5}$

2. $2x^2 - 72 = 0$

$+72 \quad +72$

$\frac{2x^2}{2} = \frac{72}{2}$

$x^2 = 36$

$\sqrt{x^2} = \pm\sqrt{36}$

$\boxed{x = \pm 6}$

3. $7x^2 + 30 = 9$

$-30 \quad -30$

$7x^2 = -21$

$x^2 = -3$

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

$\boxed{\text{no real solution}}$

4. $2y^2 + 13 = 41$

$-13 \quad -13$

$\frac{2y^2}{2} = \frac{28}{2}$

$y^2 = 14$

$\sqrt{y^2} = \pm\sqrt{14}$

$\boxed{y = \pm\sqrt{14}}$