Algebra 1: 12.6 Notes & Practice – Day 2 **Name** _____ **Period** ___
Approximating and Rewriting Radicals

Main Ideas/Questions	Notes/Examples
WARM UP	**Directions:** Rewrite each radical by extracting the perfect squares.

1. $\sqrt{169} =$

± 13

2. $\sqrt{\frac{1}{25}} = \frac{\sqrt{1}}{\sqrt{25}} =$

$\pm \frac{1}{5}$

3. $\sqrt{-49} =$

no real solution

REWRITING RADICALS with VARIABLES

You can simplify radical expressions that contain variables.

- A variable with an even (2, 4, 6…) exponent is a perfect square.
- A variable with an odd (1, 3, 5…) exponent is the product of a perfect square and a variable.

EXAMPLES

Directions: Simplify each radical expression.

1. $\sqrt{45a} =$

$\sqrt{9} \cdot \sqrt{5} \cdot \sqrt{a}$

$\pm 3\sqrt{5a}$

2. $\sqrt{27n^3}$

$\sqrt{9} \cdot \sqrt{3} \cdot \sqrt{n^2} \cdot \sqrt{n}$

$3\sqrt{3} \cdot n\sqrt{n}$

$\pm 3n\sqrt{3n}$

3. $\sqrt{\frac{25}{b^4 a^2}} = \frac{\sqrt{25}}{\sqrt{b^2}}$

$\pm \frac{5}{b}$

SOLVING RADICAL EQUATIONS

Sometimes, you can solve a quadratic equation by taking the square root of each side.

EXAMPLES

Directions: Solve each quadratic equation by taking the square root of each side.

1. $x^2 = 40$

$\sqrt{x^2} = \pm\sqrt{40}$

$x = \pm\sqrt{4} \cdot \sqrt{10}$

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

2. $x^2 = 75$

$\sqrt{x^2} = \pm\sqrt{75}$

$x = \pm\sqrt{25} \cdot \sqrt{3}$

$x = \pm 5\sqrt{3}$

3. $x^2 - 4 = 23$

$+4 \quad +4$

$x^2 = 27$

$\sqrt{x^2} = \pm\sqrt{27}$

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

4. $(x-1)^2 = 17$

$\sqrt{(x-1)^2} = \pm\sqrt{17}$

$x - 1 = \pm\sqrt{17}$

$+1 \quad +1$

$x = 1 \pm \sqrt{17}$

5. $(x+8)^2 = 81$

$\sqrt{(x+8)^2} = \pm\sqrt{81}$

$x + 8 = \pm 9$

$-8 \quad -8$

$x = -8 \pm 9$

$x = -8 + 9 = 1, \quad x = -8 - 9 = -17$