Name:________________________________ Date:__________

Notes

Algebra Section 2.7

Pages 110-116

Goal: "Find the square root of real numbers"
"Compare real numbers"

Vocabulary:

Square Roots: One of two equal factors of a number

Radicand: The number or expression inside a radical symbol.

Perfect Square: The square of an integer (will not have a decimal)

Irrational Number: A number that cannot be written as a fraction. It doesn't end or repeat.

Real Numbers: The set of all rational and irrational numbers.

radical symbol → $\sqrt{a}$ ← radicand

Example: $-\sqrt{81}$ "Take the opposite of $\sqrt{81}$.

Evaluate the expression:

Ex: $-\sqrt{9}$

-3

Ex: $\sqrt{25}$

5

Ex: $\pm\sqrt{64}$

± 8

Ex: $-\sqrt{81}$

-9

Ex: $\pm\sqrt{100}$

± 10

Ex: $\sqrt{121}$

11

Ex: $-\sqrt{400}$

-20

Ex: $\sqrt{160{,}000}$

400

Ex: $\sqrt{4900}$

70

Ex: $\sqrt{0.0081}$

0.09

Ex: $\sqrt{0.000121}$

0.011

Solve: When asked to solve you are being asked for **all possible values of x.**

Ex: $x^2 = 144$
$x = \pm 12$

Ex: $x^2 = 64$
$x = \pm 8$

Ex: $x^2 = 1$
$x = \pm 1$

Approximate Square Roots:

$\sqrt{40}$ 40 is not a perfect square. The greatest perfect square less than 40 is 36. The least perfect square greater than 40 is 49.

$\sqrt{36}$ $\sqrt{40}$ $\sqrt{49}$
6 7

The $\sqrt{40}$ is between 6 and 7.

Ex: $\sqrt{32}$

$\sqrt{25} < \sqrt{32} < \sqrt{36}$
$5 < \sqrt{32} < 6$
So $\sqrt{32}$ is between 5 and 6 (Closer to 6)

Ex: $\sqrt{103}$

$\sqrt{100} < \sqrt{103} < \sqrt{121}$
$10 < \sqrt{103} < 11$
Between 10 and 11. (Closer to 10)

Ex: $-\sqrt{48}$

$-\sqrt{49} < -\sqrt{48} < -\sqrt{36}$
$-7 < -\sqrt{48} < -6$

Ex: $-\sqrt{350}$

$-\sqrt{324} < -\sqrt{350} < -\sqrt{361}$
$-18 < -\sqrt{350} < -19$

Ex: The top of a folding table is a square whose area is 945 square inches. Approximate the side length of the tabletop to the nearest inch.

$A = s^2$
$945 = s^2$
s is between 30 and 31, but closer to 31. So approximately 31 inches

Ex: The top of a square box has an area of 320 square inches. Approximate the side length of the box top to the nearest inch.

The side length is between 17 and 18, but closer to 18. So approximately 18 inches

Irrational Number:

Classify the following numbers using all names that apply: (Simplify first if possible, then classify)

Number	Rational?	Irrational?	Integer?	Whole?
$\sqrt{24}$	**No**	**Yes**	**No**	**No**
$\sqrt{100}$	**Yes**	**No**	**Yes**	**Yes**
$-\sqrt{81}$	**Yes**	**No**	**Yes**	**No**
$-\sqrt{25}$	**Yes**	**No**	**Yes**	**No**
$\sqrt{361}$	**Yes**	**No**	**Yes**	**Yes**
$\sqrt{30}$	**No**	**Yes**	**No**	**No**

Order the following numbers from least to greatest:

Ex: $\frac{4}{3}, -\sqrt{5}, \sqrt{13}, -2.5, \sqrt{9}$

$-2.5, -\sqrt{5}, \frac{4}{3}, \sqrt{9}, \sqrt{13}$

*positive numbers are bigger.

*13 is bigger than 9, so $\sqrt{13}$ must be bigger than $\sqrt{9}$

*$\sqrt{9}$ = 3, which is bigger than $\frac{4}{3}$ so this is the smallest positive number

* Don't know $\sqrt{5}$ but 2.5 is the square root of the number you get when you multiply 2.5 times itself. (6.25)

So $-\sqrt{6.25}$ would be farther left on number line than $-\sqrt{5}$

Ex: $-\sqrt{10}, \frac{19}{5}, -3, \sqrt{12}, \sqrt{16}$

$-\sqrt{10}, -3, \sqrt{12}, \frac{19}{5}, \sqrt{16}$

Ex: $-\frac{9}{2}, 5.2, 0, \sqrt{7}, 4.1, -\sqrt{20}$

$-\frac{9}{2}, -\sqrt{20}, 0, \sqrt{7}, 4.1, 5.2$