

Name: KEY Hour: _____ Date: _____

NOTES: Section 9.1 – Square Roots

Goals: #1 - I can evaluate and approximate square roots.



Homework: Section 9.1 Worksheet

Exploration #1: Evaluate the following expressions.

1. $3^2 = 9$

2. $(-3)^2 = 9$

3. $5^2 = 25$

4. $(-5)^2 = 25$

What is the inverse operation of squaring a number?

square rooting a number

Notes:

The inverse operation of squaring a number is finding a square root of a number.

Square roots are written with a radical symbol: $\sqrt{\quad}$

The number underneath the radical symbol is called the radicand.

radical $\leftarrow \sqrt{16} \rightarrow$ radicand

Example #1: Evaluate the expression.

1. $\sqrt{64}$

8

2. $-\sqrt{64}$

-8

3. $\pm\sqrt{64}$

± 8

4. $\sqrt{-64}$

undefined

You practice: Evaluate the expression.

1. $\pm\sqrt{100}$

± 10

2. $-\sqrt{25}$

-5

3. $\sqrt{36}$

6

4. $\sqrt{16}$

4

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Notes:

A perfect square is a number made by squaring a whole number.

Perfect Squares:	1	2	3	4	5	6	7	8	9	10	11	12
	1	4	9	16	25	36	49	64	81	100	121	144

However, when we take the square root of a number that is NOT a perfect square, we approximate the answer.

Example #2: Evaluate the expression. Give the exact value if possible. Otherwise, approximate to the nearest hundredth.

1. $-\sqrt{49}$
 $\boxed{-7}$

2. $\sqrt{3}$
 $\boxed{1.73}$

3. $\sqrt{36}$
 $\boxed{6}$

4. $-\sqrt{8}$
 $\boxed{-2.83}$

Example #3: Evaluate $\sqrt{b^2 - 4ac}$ when $a = 1$, $b = -2$, and $c = -3$

$$\sqrt{(-2)^2 - 4(1)(-3)}$$
$$\sqrt{4 + 12}$$
$$\sqrt{16} = \boxed{4}$$

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

1. $\sqrt{100}$
 $\boxed{10}$

2. $-\sqrt{5}$
 $\boxed{-2.24}$

3. $\sqrt{23}$
 $\boxed{4.8}$

4. $-\sqrt{81}$
 $\boxed{-9}$

5. Evaluate $\sqrt{b^2 - 4ac}$ when $a = -1$, $b = 8$, and $c = 20$

$$\sqrt{(8)^2 - 4(-1)(20)}$$
$$\sqrt{64 + 80}$$
$$\sqrt{144} = \boxed{12}$$

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Example #4: Evaluate the following expressions. Round the results to the nearest hundredth.

$$1. 6 \pm \sqrt{5}$$

$$6 \pm 2.24$$

$$\boxed{8.24, 3.76}$$

$$2. 4 \pm \sqrt{8}$$

$$4 \pm 2.83$$

$$\boxed{6.83, 1.17}$$

$$3. \frac{2 \pm \sqrt{3}}{3}$$

$$\frac{2 \pm 1.73}{3}$$

$$\boxed{1.24, -0.09}$$

$$4. \frac{2 \pm 3\sqrt{6}}{4}$$

$$\frac{2 \pm 7.35}{4}$$

$$\boxed{2.33, -1.34}$$

You practice: Evaluate the following expressions. Round the results to the nearest hundredth.

$$1. 8 \pm \sqrt{3}$$

$$8 \pm 1.73$$

$$\boxed{9.73, 6.27}$$

$$2. -6 \pm 4\sqrt{2}$$

$$-6 \pm 5.66$$

$$\boxed{-0.34, -11.66}$$

$$3. \frac{7 \pm 3\sqrt{2}}{-1}$$

$$\frac{7 \pm 4.24}{-1}$$

$$\boxed{-11.24, -2.76}$$

$$4. \frac{1 \pm 2\sqrt{3}}{4}$$

$$\frac{1 \pm 3.46}{4}$$

$$\boxed{1.17, -0.62}$$