Lesson Objective: Solve equations involving radicals.

Vocabulary Box

extraneous solution – A solution of a simplified version of an equation that does not satisfy the original equation.

Guided Practice

Complete the following practice problems with your partner. Then your teacher will review the answers. Make sure that you show all important work.

Directions: Solve each equation. Show your work. Check your answers.

1. $\sqrt{3p} = 6$

2. $\sqrt{u+1} - 6 = -1$

3. $\sqrt{4r+8} = -12$

4. $4\sqrt{-2w-6} + 14 = 30$

5. $\sqrt{x+9} = \sqrt{2x+3}$

A. Vocabulary Words

Directions: Listed below are some equations and their possible solutions. Circle each extraneous solution.

1. $\sqrt{x-5} = 4$; x = 21

2. $\sqrt{3x} = -9$; x = 27

3. $\sqrt{w} + 18 = 11$; w = 49

4. $\sqrt{-y+6} - 15 = -13$; y = 2

B. Summarize What We Learned Today

Directions: Write three equations with radicals and solve them. Show your work. Check your answers. Then write a few sentences to explain how to solve equations with radicals. Be sure to discuss how to find extraneous solutions. You will use this explanation as a reference.

Lesson Objective: Solve equations involving radicals.

Vocabulary Box

extraneous solution – A solution of a simplified version of an equation that does not satisfy the original equation.

Independent Practice

Please complete the following practice problems on your own. Your teacher will review the answers. Make sure that you show all of your work.

<u>Directions</u>: Solve each equation. Show your work. Check your answers.

1. $\sqrt{w} = 11$

2. $\sqrt{r} + 9 = 3$

3. $\sqrt{y - 6} = 8$

4. $\sqrt{9u + 1} = \sqrt{4u + 76}$

5. $-3\sqrt{p + 12} = -12$

6. $\sqrt{a - 2} - 8 = 0$

7. $\sqrt{-h} - 22 = 8$

BONUS?

Directions: Solve each equation. Show your work. Check your answers.

1. $\sqrt{43k} - 3\sqrt{6k - 33} = 0$

2. $\sqrt{x + 2} = \sqrt{3x}$

Problem Solving

Directions: For each problem, write an equation. Then solve the equation and answer the problem. Check each answer to be sure it makes sense.

1. If 5 less than twice a number is equal to –21, what is the number?

2. If 6 equally priced alpacas cost $1800, what is the price of 1 alpaca?

3. If 8 times the sum of a number and 12 is the same as 18 less than twice the number, what is the number?

4. The square of a number is equal to 28 more than 3 times the number. What are the two possible numbers?

5. If 6 times the square root of a number is equal to 42, what is the number?

What I Know

Directions: Solve each equation. Show your work. Check your answers.

1. $\sqrt{c} + 12 = 26$

2. $\sqrt{3b} - 15 = -9$

3. $4\sqrt{a+5} + 56 = 32$

Lesson Objective: Apply the Pythagorean Theorem and its converse, as examples of the use of radical expressions, to solve problems in authentic settings.

Vocabulary Box

hypotenuse – The side opposite the right angle in a right triangle.

leg – One of two sides adjacent to the right angle in a right triangle.

Pythagorean Theorem – The theorem that relates the three sides of a right triangle: $a^2 + b^2 = c^2$.

Guided Practice

Complete the following practice problems with your partner. Then your teacher will review the answers. Make sure that you show all important work.

<u>Directions</u>: Find each missing length. Simplify your answers. Do not approximate your answers.

1. a = 9 feet, b = 12 feet, c = _____

2. a = 2 meters, b = 3 meters, c = _____

3. a = _____, b = 24 inches, c = 26 inches

4. a = 3 decimeters, b = _____, c = 9 decimeters

Directions: Determine if the following measures can be the sides of a right triangle.

1. 20, 99, 101

2. 4, 6, 10

Directions: Solve each problem.

1. Ms. Nyad is swimming in her rectangular pool that measures 50 feet long and 25 feet wide. If she swims the length of a diagonal of her pool, how far does she swim? Round your answer to the nearest tenth of a foot.

2. Tom's kite is stuck in a tall tree. He knows that all 75 yards of string have been extended. If he pulls the string tight and to the ground, the string touches at a point that is 60 yards from the base of the tree. How many **feet** high in the tree is Tom's kite stuck?

Summary/Closure

A. Vocabulary Words

1. Use your ruler to draw a right triangle with a base of 6 centimeters and a height of 8 centimeters. Identify the legs and the hypotenuse of your triangle.

2. What theorem can we use to find the length of the hypotenuse of this triangle?

B. Summarize What We Learned Today

<u>Directions</u>: Write three problems about the Pythagorean Theorem and its converse. One problem should be about finding the length of the hypotenuse of a right triangle, and one should be about finding the missing length of a leg. The third problem should be about checking if three lengths could be the lengths of the sides of a right triangle. Then write a few sentences about using the Pythagorean Theorem and its converse. You will use this explanation as a personal reference chart.