lesson fifty two - student resource sheet

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: $a^2 + b^2 = c^2$.

Independent Practice

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

Directions: Find each missing length. Simplify your answers. Do not approximate your answers. Assume that all measurements are in inches.

1. a = _____, b = 40, c = 50

2. a = 5, b = _____, c = 10

3. a = 7, b = 24, c = _____

4. a = _____, b = 8, c = 9

5. a = 11, b = _____, c = 61

6. a = 7, b = 7, c = _____

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

1. 15, 20, 25

2. 15, 112, 113

3. 15, 15, 21

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Directions: Solve each problem.

1. A family and its talking pet crow (Yes, crows can mimic!) are traveling from their house to a nearby park. The family drives 4 miles east, then 5 miles north, to get to the park. The crow flies directly from the house to the park. (Perhaps you've heard the expression *as the crow flies?*) To the nearest tenth of a mile, how far does the crow fly?

2. You want to measure the length and width of your living room to shop for new carpet. You measure the width of the room to be 12 feet. Along the length of the room is a large entertainment center on one side and a heavy, large-screen television and fold-out couch on the other. You don't want to move any of these items, so you measure the diagonal of the room instead. The diagonal measures 20 feet. What is the length of the room?

BONUS?

Directions: The following exercises deal with *isosceles* right triangles. Find each missing length. Simplify your answers. Do not approximate your answers. Assume that all measurements are in centimeters.

1. a = 6, b = _____, c = _____

2. a = _____, b = _____, c = 12

Problem Solving

Directions: A *primitive* Pythagorean triple is one in which the greatest common factor is 1. Determine if the following Pythagorean triples are primitive.

1. 20, 21, 29

2. 21, 28, 35

3. 25, 60, 65

4. 7, 24, 25

5. 51, 68, 85

6. 36, 77, 85

7. 36, 48, 60

8. 15, 36, 39

Directions: Find the missing length of each right triangle. Simplify your answers. Do not approximate your answers.

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

2. a = 2 centimeters, b = 14 centimeters, c = _____

Directions: Solve the problem.

Mr. Manzanera's class is designing a rectangular flag that will measure 18 inches by 24 inches. The flag will have a green background with a red diagonal stripe. How long will the red stripe be?

lesson fifty three - student resource sheet

Lesson Objective: Simplify rational expressions to determine equivalent expressions.

Vocabulary Box

rational expression – An expression that can be written as the ratio of two polynomials.

Example: $\frac{3x^2 - 21x}{x^2 - 14x + 49}$.

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: Simplify each expression.

1. $\frac{14n}{21}$

2. $\frac{-8m}{11m}$

3. $\frac{6k^8}{6k^5}$

4. $\frac{4h}{18h^8}$

5. $\frac{9f^2 - 64}{6f - 16}$

6. $\frac{a^2 + 24a + 144}{a^2 - 144}$

Summary/Closure

A. Vocabulary Words
Directions: Fill in the blanks to make an appropriate definition.

A _____ expression is an expression that can be written as the _____

of two _____.

B. Summarize What We Learned Today
Directions: Write three problems involving simplifying rational expressions. Be sure to include a variety of problems. Then write a few sentences about simplifying these expressions. You will use this explanation as a reference chart.

lesson fifty four - student resource sheet

Lesson Objective: Simplify rational expressions to determine equivalent expressions.

Vocabulary Box

rational expression – An expression that can be written as the ratio of two polynomials.

Example: $\frac{3x^2 - 21x}{x^2 - 14x + 49}$.

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.

Directions: Simplify each expression.

1. $\frac{35}{14a}$

2. $\frac{5m}{65m^3}$

3. $\frac{b^5c^{10}}{b^7c^7}$

4. $\frac{8d+52}{12d+30}$

5. $\frac{10f-25}{14f-35}$

6. $\frac{g^2+6g+9}{g^2-9}$

7. $\frac{100h^2-81}{100h^2-180h+81}$

8. $\frac{k^2-49}{7k+49}$

lesson fifty four - student resource sheet

Directions: Simplify each expression.

1. $\dfrac{9z-45}{40-8z}$

2. $\dfrac{5y^2-80}{10y+40}$

3. $\dfrac{4x+20}{x^2-10x+25}$

Problem Solving

Directions: If x and y are naturals numbers, y > 0, and x > y, a Pythagorean triple can be formed by the following formulas.

$a = x^2 - y^2$

$b = 2xy$

$c = x^2 + y^2$

For example, if x = 2 and y = 1, the following Pythagorean triple is formed.

$a = 2^2 - 1^2 = 3$

$b = 2(2)(1) = 4$

$c = 2^2 + 1^2 = 5$

The smallest Pythagorean triple is 3, 4, 5. In the time that remains, working with your partner, generate as many Pythagorean triples as you can by using the formulas above.

lesson fifty four - student resource sheet

Directions: Simplify each expression.

1. $\frac{24c}{28c}$

2. $\frac{8b^4}{32b^{12}}$

3. $\frac{8a-56}{a^2-49}$