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Simplify Radicals Worksheet

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Part 1: Building a Foundation

What is the square root of 64?

Hint: Think of the number that, when multiplied by itself, gives 64.

○ 6
○ 7
○ 8
○ 9

Which of the following are perfect squares? (Select all that apply)

Hint: Identify the numbers that can be expressed as the square of an integer.

☐ 16
☐ 20
☐ 25
☐ 30

Explain what a radical expression is and provide an example.

Hint: Consider how radicals are used in mathematics.

List the first three perfect cubes.

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Hint: Think of the numbers that can be expressed as the cube of an integer.

1. First perfect cube

[   ]

2. Second perfect cube

[   ]

3. Third perfect cube

[   ]

Which property of radicals allows you to simplify √(9 * 4) to 6?

Hint: Consider how multiplication under a square root can be simplified.

◯ Product Property
◯ Quotient Property
◯ Sum Property
◯ Difference Property

Part 2: Understanding and Application

Which of the following expressions are equivalent to √(36/4)? (Select all that apply)

Hint: Think about how to simplify the expression using properties of radicals.

☐ √36 / √4
☐ 6 / 2
☐ √9
☐ 3

Describe the process of rationalizing the denominator and why it is used.

Hint: Consider the benefits of having a rational number in the denominator.

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Simplify the expression √50 and choose the correct answer.

Hint: Look for perfect squares that can be factored out of 50.

○ 5√2
○ 10√5
○ 25√2
○ 2√5

Which of the following are simplified forms of √72? (Select all that apply)

Hint: Identify the perfect squares that can be factored out of 72.

☐ 6√2
☐ 3√8
☐ 2√18
☐ 4√3

Given the expression 3√18 + 2√8, simplify it by combining like radicals.

Hint: Look for common factors in the radicals.

Part 3: Analysis, Evaluation, and Creation

If √x = 5, what is the value of x?

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Hint: Square both sides of the equation to find x.

○ 10
○ 15
○ 20
○ 25

Which of the following steps are necessary to simplify the expression √(x^2 * y^2)? (Select all that apply)

Hint: Consider the properties of radicals and how they apply to variables.

☐ Apply the product property of radicals
☐ Simplify each variable separately
☐ Combine like terms
☐ Rationalize the denominator

Analyze the expression √(x^2 + 2x + 1) and explain how it can be simplified.

Hint: Consider factoring the expression inside the radical.

Evaluate the expression √(49) + √(16) and choose the correct answer.

Hint: Calculate the square roots of each number separately.

○ 10
○ 11
○ 12
○ 13

Which of the following expressions can be simplified to a whole number? (Select all that apply)

Hint: Identify the square roots that yield whole numbers.

☐ √81
☐ √45
☐ √121

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☐ √144

Create a real-world problem that involves simplifying a radical expression, and solve it.

Hint: Think of a scenario where you might encounter square roots.

Propose two different methods to simplify the expression √(48) and explain each method briefly.

Hint: Consider both factoring and using properties of radicals.

1. First method

2. Second method

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