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Adding And Subtracting Radicals Worksheet Questions and Answers PDF

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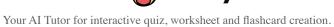
Part 1: Foundational Knowledge

What is the simplest form of the radical expression $\sqrt{50}$?

Hint: Consider the prime factorization of 50.

○ **$5\sqrt{2}$ ✓**
○ $10\sqrt{5}$
○ $25\sqrt{2}$
○ $2\sqrt{5}$

❙ The simplest form of $\sqrt{50}$ is $5\sqrt{2}$.

Which of the following are like radicals?

Hint: Look for radicals that have the same index and radicand.

☐ **$3\sqrt{7}$ and $5\sqrt{7}$ ✓**
☐ $\sqrt{3}$ and $\sqrt{5}$
☐ $2\sqrt{2}$ and $3\sqrt{3}$
☐ **$4\sqrt{x}$ and $6\sqrt{x}$ ✓**

❙ The like radicals are $3\sqrt{7}$ and $5\sqrt{7}$, and $4\sqrt{x}$ and $6\sqrt{x}$.

Explain why only like radicals can be added or subtracted directly.

Hint: Consider the properties of radicals and their coefficients.

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> **Only like radicals can be added or subtracted directly because they have the same radicand, allowing for the coefficients to be combined.**

List the steps to simplify the radical expression √72.

Hint: Think about prime factorization and perfect squares.

1. Step 1

> Find the prime factorization of 72.

2. Step 2

> Identify the perfect square factors.

3. Step 3

> Simplify the radical expression.

> The steps include finding the prime factorization of 72, identifying perfect squares, and simplifying the radical.

Part 2: comprehension

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Which expression represents the sum of 2√3 and 3√3?

Hint: Combine the coefficients of like radicals.

○ **5√3 ✓**
○ 6√3
○ 5√6
○ 2√6

❘ The sum of 2√3 and 3√3 is 5√3.

Which of the following expressions are equivalent to 4√18?

Hint: Look for simplifications of the radical expression.

☐ **12√2 ✓**
☐ 6√3
☐ 2√9
☐ **12√3 ✓**

❘ The equivalent expressions to 4√18 include 12√2 and 12√3.

Describe the process of rationalizing the denominator of the fraction 5/√2.

Hint: Consider multiplying by a form of 1.

❘ **To rationalize the denominator, multiply the numerator and denominator by √2 to eliminate the radical in the denominator.**

Part 3: Application

If √x = 3, what is the value of x?

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Hint: Square both sides of the equation.

○ 6
○ **9 ✓**
○ 12
○ 15

| The value of x is 9.

Simplify the expression 3√8 + 2√18 and select the correct form.

Hint: Look for common factors in the radicals.

☐ **9√2 ✓**
☐ 5√2 + 6√3
☐ 3√2 + 6√3
☐ 9√3

| The simplified form of 3√8 + 2√18 is 9√2.

Solve the equation √(x + 3) = 5 and provide the value of x.

Hint: Square both sides to eliminate the square root.

| **The value of x is 22 after squaring both sides and isolating x.**

Part 4: Analysis

Which of the following is the correct simplification of √(48) - √(12)?

Hint: Simplify each radical before subtract.

○ **2√3 ✓**
○ 3√3

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○ 4√3
○ 5√3

▍ The correct simplification is 2√3.

Analyze the expression 2√5 + √20 and identify the correct simplification.

Hint: Look for common factors in the radicals.

☐ 4√5
☐ **5√5 ✓**
☐ 3√5
☐ 6√5

▍ The correct simplification is 5√5.

Explain how you would simplify the expression √(x^2y) when x and y are positive integers.

Hint: Consider the properties of square roots and perfect squares.

> [text box]

▍ **To simplify √(x^2y), take the square root of x^2 and leave y under the radical, resulting in x√y.**

Part 5: Evaluation and Creation

Which method would be most effective for simplifying the expression √(75) + √(27)?

Hint: Consider the properties of radicals and common factors.

○ Direct addition
○ **Factoring out common factors ✓**
○ Rationalizing the denominator
○ Using the distributative property

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The most effective method is factoring out common factors.

Evaluate the expression √(50) - 2√(2) and select the correct simplification.

Hint: Simplify each radical before subtract.

- ☐ 3√2
- ☐ 5√2
- ☐ **4√2** ✔
- ☐ 6√2

The correct simplification is 4√2.

Create a real-world problem that involves adding or subtracti ng radicals, and solve it. Provide a detailed explanation of your solution.

Hint: Think about scenarios where measurements are involved.

An example could involve calculating the total length of two pieces of wood represented by radicals.

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