

Math Sheet

Name _____ Score _____ / 10 Teacher _____ Date _____

Radical Expression Operations

Simplify first, then add, subtract, or distribute and multiply. Assume $x > 0$ when x appears.

1. Multiply and simplify.

$$\sqrt{52} \cdot -1 \cdot \sqrt{52}$$

2. Distribute, multiply, and simplify.

$$3 \cdot \sqrt{52 \cdot x} \cdot (2 \cdot \sqrt{8 \cdot x} - 2 \cdot \sqrt{52 \cdot x} + 3 \cdot \sqrt{24 \cdot x})$$

Domain: variables are positive $x > 0$

3. Subtract and simplify.

$$- 2 \cdot \sqrt{12} - 4 \cdot \sqrt{12} - 2 \cdot \sqrt{40}$$

4. Add and simplify.

$$- 1 \cdot \sqrt{44} + \sqrt{44}$$

5. Subtract and simplify.

$$- 4 \cdot \sqrt{8 \cdot x} - 1 \cdot \sqrt{8 \cdot x} - 2 \cdot \sqrt{28 \cdot x} - 3 \cdot \sqrt{28 \cdot x}$$

Domain: variables are positive $x > 0$

6. Subtract and simplify.

$$- 2 \cdot \sqrt{8} - 4 \cdot \sqrt{8}$$

7. Add and simplify.

$$2 \cdot \sqrt{12} + 3 \cdot \sqrt{12} + 3 \cdot \sqrt{24}$$

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Radical Expression Operations

Simplify first, then add, subtract, or distribute and multiply. Assume $x > 0$ when x appears.

8. Distribute, multiply, and simplify.

$$2 \cdot \sqrt{52} \cdot (2 \cdot \sqrt{24} - 1 \cdot \sqrt{8})$$

9. Add and simplify.

$$\sqrt{24 \cdot x} + 2 \cdot \sqrt{24 \cdot x} + 4 \cdot \sqrt{44 \cdot x} + 4 \cdot \sqrt{44 \cdot x}$$

Domain: variables are positive $x > 0$

10. Distribute, multiply, and simplify.

$$\sqrt{8 \cdot x} \cdot (-2 \cdot \sqrt{24 \cdot x} - 2 \cdot \sqrt{28 \cdot x} + \sqrt{44 \cdot x})$$

Domain: variables are positive $x > 0$

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Name _____ Score _____ / 10 Teacher _____ Date _____

Radical Expression Operations

Answer Key

Simplify first, then add, subtract, or distribute and multiply. Assume $x > 0$ when x appears.

1. Multiply and simplify.

$$\sqrt{52} \cdot -1 \cdot \sqrt{52}$$

Work:

$$\sqrt{52} \cdot -1 \cdot \sqrt{52} = -52$$

2. Distribute, multiply, and simplify.

$$3 \cdot \sqrt{52 \cdot x} \cdot (2 \cdot \sqrt{8 \cdot x} - 2 \cdot \sqrt{52 \cdot x} + 3 \cdot \sqrt{24 \cdot x})$$

Domain: variables are positive $x > 0$

Work:

$$3 \cdot \sqrt{52 \cdot x} \cdot (2 \cdot \sqrt{8 \cdot x} - 2 \cdot \sqrt{52 \cdot x} + 3 \cdot \sqrt{24 \cdot x}) = 6 \cdot \sqrt{52 \cdot x} \cdot \sqrt{8 \cdot x} - 6 \cdot \sqrt{52 \cdot x} \cdot \sqrt{52 \cdot x} + 9 \cdot \sqrt{52 \cdot x} \cdot \sqrt{24 \cdot x}$$

$$6 \cdot \sqrt{52 \cdot x} \cdot \sqrt{8 \cdot x} - 6 \cdot \sqrt{52 \cdot x} \cdot \sqrt{52 \cdot x} + 9 \cdot \sqrt{52 \cdot x} \cdot \sqrt{24 \cdot x} = 24 \cdot x \cdot \sqrt{26} - 312 \cdot x + 36 \cdot x \cdot \sqrt{78}$$

3. Subtract and simplify.

$$- 2 \cdot \sqrt{12} - 4 \cdot \sqrt{12} - 2 \cdot \sqrt{40}$$

Work:

$$- 2 \cdot \sqrt{12} - 4 \cdot \sqrt{12} - 2 \cdot \sqrt{40} = - 4 \cdot \sqrt{3} - 8 \cdot \sqrt{3} - 4 \cdot \sqrt{10}$$

$$- 4 \cdot \sqrt{3} - 8 \cdot \sqrt{3} - 4 \cdot \sqrt{10} = - 12 \cdot \sqrt{3} - 4 \cdot \sqrt{10}$$

4. Add and simplify.

$$- 1 \cdot \sqrt{44} + \sqrt{44}$$

Work:

$$- 1 \cdot \sqrt{44} + \sqrt{44} = - 2 \cdot \sqrt{11} + 2 \cdot \sqrt{11}$$

$$- 2 \cdot \sqrt{11} + 2 \cdot \sqrt{11} = 0$$

5. Subtract and simplify.

$$- 4 \cdot \sqrt{8 \cdot x} - 1 \cdot \sqrt{8 \cdot x} - 2 \cdot \sqrt{28 \cdot x} - 3 \cdot \sqrt{28 \cdot x}$$

Domain: variables are positive $x > 0$

Work:

$$- 4 \cdot \sqrt{8 \cdot x} - 1 \cdot \sqrt{8 \cdot x} - 2 \cdot \sqrt{28 \cdot x} - 3 \cdot \sqrt{28 \cdot x} = - 8 \cdot \sqrt{2 \cdot x} - 2 \cdot \sqrt{2 \cdot x} - 4 \cdot \sqrt{7 \cdot x} - 6 \cdot \sqrt{7 \cdot x}$$

$$- 8 \cdot \sqrt{2 \cdot x} - 2 \cdot \sqrt{2 \cdot x} - 4 \cdot \sqrt{7 \cdot x} - 6 \cdot \sqrt{7 \cdot x} = - 10 \cdot \sqrt{2 \cdot x} - 10 \cdot \sqrt{7 \cdot x}$$

6. Subtract and simplify.

$$- 2 \cdot \sqrt{8} - 4 \cdot \sqrt{8}$$

Work:

$$- 2 \cdot \sqrt{8} - 4 \cdot \sqrt{8} = - 4 \cdot \sqrt{2} - 8 \cdot \sqrt{2}$$

$$- 4 \cdot \sqrt{2} - 8 \cdot \sqrt{2} = -12 \cdot \sqrt{2}$$

7. Add and simplify.

$$2 \cdot \sqrt{12} + 3 \cdot \sqrt{12} + 3 \cdot \sqrt{24}$$

Work:

$$2 \cdot \sqrt{12} + 3 \cdot \sqrt{12} + 3 \cdot \sqrt{24} = 4 \cdot \sqrt{3} + 6 \cdot \sqrt{3} + 6 \cdot \sqrt{6}$$

$$4 \cdot \sqrt{3} + 6 \cdot \sqrt{3} + 6 \cdot \sqrt{6} = 10 \cdot \sqrt{3} + 6 \cdot \sqrt{6}$$

Radical Expression Operations

Answer Key

Simplify first, then add, subtract, or distribute and multiply. Assume $x > 0$ when x appears.

8. Distribute, multiply, and simplify.

$$2 \cdot \sqrt{52} \cdot (2 \cdot \sqrt{24} - 1 \cdot \sqrt{8})$$

Work:

$$2 \cdot \sqrt{52} \cdot (2 \cdot \sqrt{24} - 1 \cdot \sqrt{8}) = 4 \cdot \sqrt{52} \cdot \sqrt{24} - 2 \cdot \sqrt{52} \cdot \sqrt{8}$$

$$4 \cdot \sqrt{52} \cdot \sqrt{24} - 2 \cdot \sqrt{52} \cdot \sqrt{8} = 16 \cdot \sqrt{78} - 8 \cdot \sqrt{26}$$

9. Add and simplify.

$$\sqrt{24 \cdot x} + 2 \cdot \sqrt{24 \cdot x} + 4 \cdot \sqrt{44 \cdot x} + 4 \cdot \sqrt{44 \cdot x}$$

Domain: variables are positive $x > 0$

Work:

$$\sqrt{24 \cdot x} + 2 \cdot \sqrt{24 \cdot x} + 4 \cdot \sqrt{44 \cdot x} + 4 \cdot \sqrt{44 \cdot x} = 2 \cdot \sqrt{6 \cdot x} + 4 \cdot \sqrt{6 \cdot x} + 8 \cdot \sqrt{11 \cdot x} + 8 \cdot \sqrt{11 \cdot x}$$

$$2 \cdot \sqrt{6 \cdot x} + 4 \cdot \sqrt{6 \cdot x} + 8 \cdot \sqrt{11 \cdot x} + 8 \cdot \sqrt{11 \cdot x} = 6 \cdot \sqrt{6 \cdot x} + 16 \cdot \sqrt{11 \cdot x}$$

10. Distribute, multiply, and simplify.

$$\sqrt{8 \cdot x} \cdot (-2 \cdot \sqrt{24 \cdot x} - 2 \cdot \sqrt{28 \cdot x} + \sqrt{44 \cdot x})$$

Domain: variables are positive $x > 0$

Work:

$$\sqrt{8 \cdot x} \cdot (-2 \cdot \sqrt{24 \cdot x} - 2 \cdot \sqrt{28 \cdot x} + \sqrt{44 \cdot x}) = -2 \cdot \sqrt{8 \cdot x} \cdot \sqrt{24 \cdot x} - 2 \cdot \sqrt{8 \cdot x} \cdot \sqrt{28 \cdot x} + \sqrt{8 \cdot x} \cdot \sqrt{44 \cdot x}$$

$$-2 \cdot \sqrt{8 \cdot x} \cdot \sqrt{24 \cdot x} - 2 \cdot \sqrt{8 \cdot x} \cdot \sqrt{28 \cdot x} + \sqrt{8 \cdot x} \cdot \sqrt{44 \cdot x} = -16 \cdot x \cdot \sqrt{3} - 8 \cdot x \cdot \sqrt{14} + 4 \cdot x \cdot \sqrt{22}$$