

Radicals Lesson 5

Division with Radical Expressions

Activity Answer Key

Write the following radical expressions. When you hear the word times, only use a multiplication dot when specifically indicated. Also, number each problem. [There is a braille answer document "L5-Radicals-Activity-Answers.brf" that can be used to independently check answers.]

1. The square root of open fraction twenty-five over sixty-four close fraction end root equals open fraction the square root of twenty-five end root over the square root of sixty-four end root close fraction equals five-eighths.

$$\sqrt{\frac{25}{64}} = \frac{\sqrt{25}}{\sqrt{64}} = \frac{5}{8}$$

Answer:

$$\sqrt{\frac{25}{64}} = \frac{\sqrt{25}}{\sqrt{64}} = \frac{5}{8}$$

2. The cube root of open fraction twenty-seven over eight close fraction end root equals open fraction the cube root of twenty-seven end root over the cube root of eight end root close fraction equals three-halves.

$$\sqrt[3]{\frac{27}{8}} = \frac{\sqrt[3]{27}}{\sqrt[3]{8}} = \frac{3}{2}$$

Answer:

$$\sqrt[3]{\frac{27}{8}} = \frac{\sqrt[3]{27}}{\sqrt[3]{8}} = \frac{3}{2}$$

3. The cube root of open fraction twenty-seven over x to the sixth power close fraction end root equals open fraction the cube root of twenty-seven end root over the cube root of x to the sixth power end root close fraction equals open fraction three over x squared close fraction.

$$\sqrt[3]{\frac{27}{x^6}} = \frac{\sqrt[3]{27}}{\sqrt[3]{x^6}} = \frac{3}{x^2}$$

Answer:

$$\sqrt[3]{\frac{8}{64}} = \frac{\sqrt[3]{8}}{\sqrt[3]{64}} = \frac{\sqrt[3]{2^3}}{\sqrt[3]{4^3}} = \frac{2}{4} = \frac{1}{2}$$

4. The cube root of open fraction eight over sixty-four close fraction end root equals open fraction the cube root of eight end root over the cube root of sixty-four end root close fraction equals open fraction the cube root of two cubed end root over the cube root of four cubed end root close fraction equals two-fourths equals one-half.

$$\sqrt[3]{\frac{8}{64}} = \frac{\sqrt[3]{8}}{\sqrt[3]{64}} = \frac{\sqrt[3]{2^3}}{\sqrt[3]{4^3}} = \frac{2}{4} = \frac{1}{2}$$

Answer:

$$\sqrt[3]{\frac{y^4}{z^3}} = \frac{\sqrt[3]{y^4}}{\sqrt[3]{z^3}} = \frac{\sqrt[3]{y^3 \cdot y}}{\sqrt[3]{z^3}} = \frac{y\sqrt[3]{y}}{z}$$

5. The cube root of open fraction y to the fourth power over z cubed close fraction end root equals open fraction the cube root of y to the fourth power end root over the cube root of z cubed end root close fraction equals open fraction the cube root of y cubed times (multiplication dot) y end root over the cube root of z cubed end root close fraction equals open fraction y cube root of y end root over z close fraction.

$$\sqrt[3]{\frac{y^4}{z^3}} = \frac{\sqrt[3]{y^4}}{\sqrt[3]{z^3}} = \frac{\sqrt[3]{y^3 \cdot y}}{\sqrt[3]{z^3}} = \frac{y\sqrt[3]{y}}{z}$$

Answer:

$$\sqrt[3]{\frac{y^4}{z^3}} = \frac{\sqrt[3]{y^4}}{\sqrt[3]{z^3}} = \frac{\sqrt[3]{y^3 \cdot y}}{\sqrt[3]{z^3}} = \frac{y\sqrt[3]{y}}{z}$$

6. Open fraction the square root of one hundred twenty-five end root over the square root of five end root close fraction equals the square root of open fraction one hundred twenty-five over five close fraction end root equals the square root of twenty-five end root equals five.

$$\frac{\sqrt{125}}{\sqrt{5}} = \sqrt{\frac{125}{5}} = \sqrt{25} = 5$$

Answer:

$$\frac{\sqrt{125}}{\sqrt{5}} = \sqrt{\frac{125}{5}} = \sqrt{25} = 5$$

7. Open fraction two cube root of one hundred sixty-two end root over the cube root of two end root close fraction equals two cube root of open fraction one hundred sixty-two over two close fraction end root equals two cube root of eighty-one end root.

$$\frac{2\sqrt[3]{162}}{\sqrt[3]{2}} = 2\sqrt[3]{\frac{162}{2}} = 2\sqrt[3]{81}$$

Answer:

$$\frac{2\sqrt[3]{162}}{\sqrt[3]{2}} = 2\sqrt[3]{\frac{162}{2}} = 2\sqrt[3]{81}$$

8. Two cube root of eighty-one end root equals two cube root of twenty-seven times (multiplication dot) three end root equals two cube root of three cubed times (multiplication dot) three end root equals six cube root of three end root.

Problem 8 completes the simplification of Problem 7 and serves as a review.

$$2\sqrt[3]{81} = 2\sqrt[3]{27 \cdot 3} = 2\sqrt[3]{3^3 \cdot 3} = 6\sqrt[3]{3}$$

Answer:

$$2\sqrt[3]{81} = 2\sqrt[3]{27 \cdot 3} = 2\sqrt[3]{3^3 \cdot 3} = 6\sqrt[3]{3}$$

9. Open fraction ten times the square root of forty-eight y z end root over five times the square root of three end root close fraction equals two times the square root of open fraction forty-eight y z over three close fraction end root equals two times the square root of sixteen y z end root.

$$\frac{10\sqrt{48yz}}{5\sqrt{3}} = 2\sqrt{\frac{48yz}{3}} = 2\sqrt{16yz}$$

Answer:

$$\frac{10\sqrt{48yz}}{5\sqrt{3}} = 2\sqrt{\frac{48yz}{3}} = 2\sqrt{16yz}$$

10. Two square root of sixteen y z end root equals two square root of four squared y z end root equals two times (multiplication dot) four square root of y z end root equals eight square root of y z end root.

Problem 10 completes the simplification of Problem 9 and serves as a review.

$$2\sqrt{16yz} = 2\sqrt{4^2yz} = 2 \cdot 4\sqrt{yz} = 8\sqrt{yz}$$

Answer: $2\sqrt{16yz} = 2\sqrt{4^2yz} = 2 \cdot 4\sqrt{yz} = 8\sqrt{yz}$