

Algebra 1

Chapter 7

Section 7-5

Review: Fraction Powers

$$25^{\frac{1}{2}}$$

5

$$16^{\frac{5}{4}}$$

$$2^5$$

32

$$27^{\frac{6}{18}} = \frac{1}{3}$$

$$27^{\frac{1}{3}}$$

3

Review: Square roots

$$\sqrt{25} = 25^{\frac{1}{2}}$$

5

$$\sqrt[3]{27} = 27^{\frac{1}{3}}$$

3

$$\left(\sqrt[4]{16}\right)^5 = 16^{\frac{5}{4}}$$

 2^5

32

Equivalence of Radicals and Rational Exponents

If the n th root of a is a real number and m and n are positive integers, then

$$a^{\frac{1}{n}} = \sqrt[n]{a} \text{ and } a^{\frac{m}{n}} = \sqrt[n]{a^m} = (\sqrt[n]{a})^m.$$

Exponential and Radical Expressions

An exponential expression has an exponent

$$y^{\frac{1}{2}}$$

A radical expression has a radical symbol ($\sqrt{\quad}$)

$$\sqrt[5]{W}$$

Rewrite the exponential expressions in radical form

$$k^{\frac{3}{5}}$$

$$\sqrt[5]{k^3}$$

$$7^{\frac{1}{10}}$$

$$\sqrt[10]{7}$$

$$2f^{\frac{5}{9}}$$

$$2 \cdot \sqrt[9]{f^5}$$

Rewrite the exponential expressions in radical form

$$3\sqrt[3]{h^3}$$

$$= 3\sqrt{h^3}$$

$$\sqrt[3]{8}$$

$$\sqrt[5]{(2f)^8}$$

$$\sqrt[5]{256f^8}$$

Write the expressions in radical form. Simplify your answer.

$$9^{\frac{1}{2}}h^{\frac{1}{2}}$$

$$(9h)^{\frac{1}{2}}$$

$$\sqrt{9h}$$

$$3\sqrt{h}$$

$$(4x)^{\frac{1}{5}}$$

$$\sqrt[5]{(4x)} = \sqrt[5]{4x}$$

$$(8x)^{\frac{2}{3}} = 8^{\frac{2}{3}} \times x^{\frac{2}{3}}$$

$$4 \cdot \sqrt[3]{x^2}$$

$$\sqrt[3]{(8x)^2}$$

$$\sqrt[3]{64x^2}$$

$$\frac{2}{16} \times \frac{4}{64}$$

$$4 \cdot \sqrt[3]{x^2}$$

Simplify the product

$$\begin{aligned}
 & (100b)^{\frac{3}{2}} (49b)^{\frac{1}{2}} \\
 & (\sqrt{100})^3 \leftarrow (100^{\frac{3}{2}} b^{\frac{3}{2}}) (49^{\frac{1}{2}} \cdot b^{\frac{1}{2}}) \\
 & 1000 b^{\frac{3}{2}} \cdot 7 b^{\frac{1}{2}} \\
 & 7000 b^{\frac{4}{2}} = 7000 b^2
 \end{aligned}$$

Rewrite the radical expressions in exponential form

$$\sqrt{x}$$

$$x^{\frac{1}{2}}$$

$$\sqrt[3]{2y}$$

$$(2y)^{\frac{1}{3}}$$

$$2^{\frac{1}{3}} y^{\frac{1}{3}}$$

$$(\sqrt[4]{6})^9$$

$$6^{\frac{9}{4}}$$

Rewrite and simplify the radical expressions in exponential form

$$3\sqrt{h^5}$$

$$3 \cdot h^{5/2}$$

$$\sqrt[3]{m^{10}}$$

$$m^{10/3}$$

$$\sqrt[20]{h^5}$$

$$h^{5/20} = h^{1/4}$$

Write the expressions in exponential form. Simplify your answer

$$(\sqrt[6]{x})(2\sqrt{x})$$

$$x^{1/6} \cdot 2x^{1/2}$$

$$2x^{1/6 + 1/2} \rightarrow 1/6 + 3/6 = 4/6 = 2/3$$

$$2x^{2/3}$$

$$(\sqrt{c})(\sqrt[4]{c})^3$$

$$c^{1/2} \cdot c^{3/4}$$

$$c^{1/2 + 3/4} \rightarrow 2/4 + 3/4 = 5/4$$

$$c^{5/4}$$

Write the expressions in exponential form. Simplify your answer

$$\sqrt[7]{x} + \sqrt[9]{x}$$

$$x^{\frac{1}{7}} + x^{\frac{1}{9}}$$

final answer
-not like terms
so can't add
together

$$(\sqrt[4]{y})(\sqrt{y})(\sqrt[4]{y})$$

$$y^{\frac{1}{4}} \cdot y^{\frac{1}{2}} \cdot y^{\frac{1}{4}}$$

$$y^{\frac{1}{4} + \frac{1}{2} + \frac{1}{4}} \rightarrow y^{\frac{1}{4} + \frac{2}{4} + \frac{1}{4}} = y^{\frac{4}{4}} = y^1 = y$$

y

$$y^1 = y$$