

7.4 – Notes Radical Exponents

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Expressing rational expressions in Radical Form and Exponential Form

Radical Form

Exponential Form

$$\sqrt{25}$$

$$25^{1/2}$$

$$\sqrt[3]{27}$$

$$27^{1/3}$$

$$\sqrt[4]{16}$$

$$16^{1/4}$$

Rational Exponents

If $\sqrt[n]{a}$ is a real number and m is an integer

$$a^{1/n} = \sqrt[n]{a}$$

$$a^{m/n} = \sqrt[n]{a^m} = (\sqrt[n]{a})^m$$

Examples:

$$64^{1/3}$$

$$7^{1/2} \cdot 7^{1/2}$$

$$5^{1/3} \cdot 25^{1/3}$$

Converting to and from Radical Form

Write each expression in radical form.

$$x^{2/7}$$

$$y^{-0.4}$$

Write each expression in exponential form

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

$$(\sqrt[3]{b})^5$$

Simplifying Numbers with Radical Exponents

Examples:

$$(-27)^{2/3}$$

$$25^{-2.5}$$

Writing Expressions in Simplest Form

Examples:

$$(243a^{-10})^{2/5}$$

$$(x^{2/3}y^{-1/4})^{-4}$$

$$y^{2/3}y^{1/5}$$

$$x^{1/4} \div x^{3/5}$$

$$\frac{a^{1/3}b^{3/5}}{a^{1/2}b^{2/5}}$$

$$\left(\frac{81y^{16}}{16y^{12}}\right)^{1/2}$$