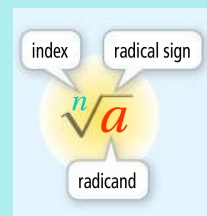


Section 7-5
Rational Exponents and
Radicals

Students will be able to rewrite expressions involving radicals and rational exponents.

**Terms of a
Radical Expression:**



In this lesson we are going to look at the relationship between radical expressions and expressions using rational exponents.

$$\sqrt{25} = 5 \quad 25 = ?^2$$

$$\sqrt[3]{27} = 3 \quad 27 = ?^3$$

$\sqrt[1]{25}$ can also be written as $25^{\frac{1}{2}}$
and both of them are equal to 5.

We can also write expressions that have rational exponents in radical form.

$8^{\frac{2}{3}}$ can be written in two different ways

$$(8^2)^{\frac{1}{3}} = \sqrt[3]{8^2} = \sqrt[3]{64} ?$$

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

What is $a^{\frac{5}{6}}$ in radical form?

$$(a^5)^{\frac{1}{6}} = \sqrt[6]{a^5}$$

Write the following in radical form.

$$5x^{\frac{1}{3}} = 5\sqrt[3]{x^1} = 5\sqrt[3]{x}$$

$$(54y)^{\frac{2}{3}} = \sqrt[3]{(54y)^2} = \sqrt[3]{2916y^2} =$$

$$\sqrt[3]{27 \cdot 108y^2} = 3\sqrt[3]{108y^2} =$$

$$3\sqrt[3]{27 \cdot 4 \cdot y^2} = 9\sqrt[3]{4y^2}$$

Converting to Exponential Form

Write in exponential form:

$$\sqrt[5]{b^3} (b^3)^{\frac{1}{5}} = b^{\frac{3}{5}}$$

$$\sqrt[3]{27d^5} = (27d^5)^{\frac{1}{3}} = 27^{\frac{1}{3}}d^{\frac{5}{3}} = 3d^{\frac{5}{3}}$$

Rewrite in exponential form:

$$12 \sqrt[3]{x^4} \quad 12 (x^4)^{1/3} = 12x^{4/3}$$

$$\sqrt[4]{256a^8} \quad (256a^8)^{1/4} = 256^{1/4} a^{8/4} \\ = 4a^2$$

Hwk: pg. 450 - 452
#12 - 32 (4th), 38 - 50 evens,
51,