

11.2 Fractional Exponents

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

index

$$16^{\frac{1}{2}} = \sqrt{16}$$

square root

$$= 4$$

$$a^{\frac{m}{n}} = \sqrt[n]{a^m}$$

power
root

ex

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

$$= \sqrt[3]{64}$$

$$= 4$$

11.3 Simplest Radical Form

$$\begin{array}{l}
 1) \sqrt[n]{a^n} = a \\
 2) \sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab} \\
 3) \sqrt[n]{\frac{a}{b}} = \frac{\sqrt[n]{a}}{\sqrt[n]{b}} \\
 4) \sqrt[m]{\sqrt[n]{a}} = \sqrt[mn]{a} \\
 5) \sqrt[m]{a^{n \cdot p}} = \sqrt[m]{a^n}
 \end{array}$$

Rationalizing Denominators

- eliminate radicals from the denominator of a fraction.

Simplifying Radicals

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

$$\sqrt{27} = \sqrt{9 \cdot 3} = 3\sqrt{3}$$

$$\sqrt{150} = \sqrt{25 \cdot 6} = 5\sqrt{6}$$

$$\sqrt{8x^2y^5} = \sqrt{4 \cdot 2 \cdot x^2 \cdot y^2 \cdot y} = 2xy\sqrt{2y}$$

$$\sqrt[3]{81} = \sqrt[3]{3^4} = \sqrt[3]{27 \cdot 3} = 3\sqrt[3]{3}$$

$$\sqrt[3]{x} : \sqrt[3]{x^2} : \sqrt[3]{x^3} = x$$

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

$$\sqrt[3]{x^5} = \sqrt[3]{x^3 \cdot x^2} = x\sqrt[3]{x^2}$$

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

$$\sqrt[3]{x^{26}} = \sqrt[3]{x^{24} \cdot x^2} = x^8 \sqrt[3]{x^2}$$

$$\sqrt[5]{a^{73}} = \sqrt[5]{a^{70} \cdot a^3} = a^{14} \sqrt[5]{a^3}$$



