

Honors Algebra II

Notes Section 3.2

Apply Properties of Rational Exponents

PROPERTIES

I. $a^m \cdot a^n =$ _____

VII. $\sqrt[n]{a \cdot b} =$ _____

II. $(a^m)^n =$ _____

VIII. $\frac{a}{b} =$ _____

III. $(ab)^m =$ _____

IV. $a^{-m} =$ _____

n is ODD $\sqrt[n]{x^n} =$ _____

V. $\frac{a^m}{a^n} =$ _____

n is EVEN $\sqrt[n]{x^n} =$ _____

VI. $\frac{a^m}{b^m} =$ _____

VI. $\frac{a^m}{b^m} =$ _____

EXAMPLE 1 Simplify the expression.

a) $7^{1/4} =$ _____

b) $(6^{1/2} \cdot 4^{1/3})^2 =$ _____

c) $(4^5 \cdot 3^5)^{-1/5} =$ _____

d) $\frac{5}{5^{1/3}} =$ _____

e) $\frac{4 \cdot 2^{1/3} \cdot 2}{6^{1/3}} =$ _____

EXAMPLE 2 Simplify and approximate.

$$9.75(34 \times 10^3)^{2/3}$$

EXAMPLE 3 Simplify the expression.

a) $\sqrt[3]{12} \cdot \sqrt[3]{18} =$ _____

b) $\frac{\sqrt[4]{80}}{\sqrt[4]{5}} =$ _____

EXAMPLE 4 Write the expression in simplest form.

a) $\sqrt[3]{135} =$ _____

b) $\frac{\sqrt[5]{7}}{\sqrt[5]{8}}$ _____

c) $\frac{\sqrt[4]{10}}{\sqrt[4]{27}}$ _____

EXAMPLE 5 Simplify the expression.

a) $\sqrt[4]{10} + 7\sqrt[4]{10} =$ _____

b) $2(8^{1/5}) + 10(8^{1/5}) =$ _____

c) $\sqrt[3]{54} - \sqrt[3]{2} =$ _____

d) $\sqrt[3]{81} - \sqrt[3]{24} =$ _____

EXAMPLE 6 Simplify the expression.

a) $\sqrt[3]{64y^6} =$ _____

b) $(27p^3q^{12})^{1/3} =$ _____

c) $\frac{m^4}{\sqrt[4]{n^8}} =$ _____

d) $\frac{14xy^{1/3}}{2x^{3/4}z^{-6}} =$ _____

EXAMPLE 7 Write the expression in simplest form.

a) $\sqrt{4a^8b^{14}c^5} =$ _____

b) $x = \sqrt[3]{y^8}$ _____

c) $p^8 = \sqrt[7]{q^5}$ _____

EXAMPLE 8 Perform the indicated operation.

a) $\frac{1}{5}\sqrt{w} + \frac{3}{5}\sqrt{w} =$ _____

b) $3xy^{1/4} - 8xy^{1/4} =$ _____

c) $12\sqrt[3]{2z^5} - z\sqrt[3]{54z^2} =$ _____

d) $10\sqrt[4]{5s^7} - s\sqrt[4]{80s^3} =$ _____