Simplifying n^{th} Roots (Product Property)

Name _____

Date _____ Period _____

Properties of n^{th} Roots

Product Property

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

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

Quotient Property

$$\sqrt[n]{\frac{a}{b}} = \frac{\sqrt[n]{a}}{\sqrt[n]{b}}$$

$$\sqrt[4]{\frac{16}{81}} = \frac{\sqrt[4]{16}}{\sqrt[4]{81}} = \frac{2}{3}$$

Simplify the following n^{th} Roots

Popular n^{th} Roots

$$\sqrt[3]{32}$$

3^{rd} roots

Prime Factorization

$$\sqrt[3]{32}$$

Simplify the following n^{th} Roots

Popular n^{th} Roots

$\sqrt[4]{96}$

4^{th} roots
$\sqrt[4]{1} = 1$
$\sqrt[4]{16} = 2$
$\sqrt[4]{81} = 3$
$\sqrt[4]{256} = 4$

Prime Factorization

$\sqrt[4]{96}$

Simplify the following n^{th} Roots

Popular n^{th} Roots

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

3^{rd} roots
$\sqrt[3]{x^3} = x$

Prime Factorization

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

Simplify the following n^{th} Roots

Popular n^{th} Roots

$\sqrt[4]{x^9 \cdot y^5}$

4^{th} roots
$\sqrt[4]{x^4} = x$
$\sqrt[4]{y^4} = y$

Prime Factorization

$\sqrt[4]{x^9 \cdot y^5}$

Simplify the following n^{th} Roots

Popular n^{th} Roots

$\sqrt[3]{24x^3y^4}$

3^{rd} roots
$\sqrt[3]{8} = 2$
$\sqrt[3]{x^3} = x$
$\sqrt[3]{y^3} = y$

Prime Factorization

$\sqrt[3]{24x^3y^4}$