 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

$$\sqrt[3]{\frac{x^3}{9}}$$

$$\sqrt[3]{\frac{x^6}{4}}$$

3^{rd} roots
$\sqrt[3]{1} = 1$
$\sqrt[3]{8} = 2$
$\sqrt[3]{27} = 3$
$\sqrt[3]{64} = 4$

Simplify the following n^{th} Roots

$\sqrt[3]{\frac{64}{x^2}}$

$\sqrt[3]{\frac{16}{ab^2}}$

3^{rd} roots
$\sqrt[3]{1} = 1$
$\sqrt[3]{8} = 2$
$\sqrt[3]{27} = 3$
$\sqrt[3]{64} = 4$

Simplify the following n^{th} Roots

$\sqrt[4]{\frac{x^6}{8}}$

$\sqrt[4]{\frac{64}{a^4b}}$

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

Simplify the following n^{th} Roots

$$\frac{4y^{\frac{1}{2}}}{x^{\frac{1}{4}}}$$

$$\frac{3x^2 + 2x^{\frac{1}{2}}}{x^{\frac{1}{2}}}$$