

Name: _____ Hour: _____ Date: _____

NOTES: Section 6.2 – Apply Properties of Rational Exponents

Goals: #1 - I can simplify a numerical expression using properties of radicals and rational exponents.

#2 - I can simplify a variable expression using properties of radicals and rational exponents.

#3 - I can add and subtract expressions with radicals and rational exponents.

Homework: Lesson 6.2 Worksheet



Warm Up:

1. Evaluate the expression without using a calculator.

a. $(\sqrt[4]{81})^4$

b. $4^{5/2}$

c. $(-32)^{3/5}$

2. Solve the equation. Round your answer to the nearest hundredth.

a. $2x^5 + 73 = 53$

b. $(x + 3)^4 = 362$

Review:

Recall the properties of exponents:

• $a^m \cdot a^n = a^{\boxed{}}$

• $(a^m)^n = a^{\boxed{}}$

• $(ab)^m = a^{\boxed{}} b^{\boxed{}}$

• $a^{-m} = \frac{1}{a^{\boxed{}}}$

• $\frac{a^m}{a^n} = a^{\boxed{}}$

• $\left(\frac{a}{b}\right)^m = \frac{a^{\boxed{}}}{b^{\boxed{}}}$

Name: _____ Hour: _____ Date: _____

Example #1: Use the properties of rational exponents to simplify the expression.

a. $7^{1/4} \cdot 7^{1/2}$

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

c. $\frac{5}{5^{1/3}}$

d. $\left(\frac{42^{1/3}}{6^{1/3}}\right)^2$

You practice: Use the properties of rational exponents to simplify the expression.

a. $\left(\frac{20^{1/2}}{5^{1/2}}\right)^3$

b. $(4^5 \cdot 3^5)^{-1/5}$

c. $2^{3/4} \cdot 2^{1/2}$

Review:

Recall the properties of radicals:

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

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

Example #2: Use the properties of radicals to simplify the expression.

a. $\sqrt[3]{12} \cdot \sqrt[3]{18}$

b. $\frac{\sqrt[4]{80}}{\sqrt[4]{5}}$

Name: _____ Hour: _____ Date: _____

Example #3: Write the expression in simplest form.

a. $\sqrt[3]{135}$

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

You practice: Write the expression in simplest form.

a. $\sqrt[4]{27} \cdot \sqrt[4]{3}$

b. $\frac{\sqrt[3]{250}}{\sqrt[3]{2}}$

c. $\sqrt[5]{\frac{3}{4}}$

Example #4: Perform the indicated operation. Assume all variables are positive.

a. $\sqrt[4]{10} + 7\sqrt[4]{10}$

b. $2\left(8^{\frac{1}{5}}\right) + 10\left(8^{\frac{1}{5}}\right)$

c. $\sqrt[3]{54} - \sqrt[3]{2}$

You practice: Perform the indicated operation. Assume all variables are positive.

a. $7\sqrt[5]{12} - \sqrt[5]{12}$

b. $\sqrt[3]{81} - \sqrt[3]{24}$

c. $4\left(9^{\frac{2}{3}}\right) + 8\left(9^{\frac{2}{3}}\right)$

Name: _____ Hour: _____ Date: _____

Example #5: Write the expression in simplest form. Assume all variables are positive.

a. $\sqrt[3]{64y^6}$

b. $\sqrt[4]{\frac{m^4}{n^8}}$

c. $\sqrt[5]{4x^8y^{14}z^5}$

d. $\sqrt[3]{\frac{x}{y^8}}$

e. $3xy^{1/4} + 8xy^{1/4}$

f. $12\sqrt[3]{2z^5} - z\sqrt[3]{54z^2}$

You practice: Write the expression in simplest form. Assume all variables are positive.

a. $(27p^3q^{12})^{1/3}$

b. $\frac{14xy^{1/3}}{2x^{3/4}z^{-6}}$

c. $\sqrt[3]{6x^4y^9z^{14}}$

d. $\sqrt[7]{\frac{p^8}{q^5}}$

e. $18\sqrt[3]{u} - 11\sqrt[3]{u}$

f. $10\sqrt[4]{5s^7} - s\sqrt[4]{80s^3}$