

Today's Learning Goal(s):

Date: _____

By the end of the class, I will be able to:

- a) evaluate a power involving a rational exponent.
- b) simplify expressions involving rational exponents.

Last day's work: **READ p.221**

pp. 221-223 #(1 – 9)ace, 11b, 13acegi, 16ace

4.3 Working with Rational Exponents

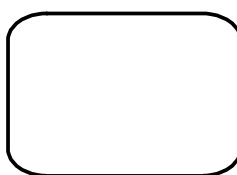
Date: _____

Rational Exponents are exponents that are **fractions**, and are directly related to radicals.

$4^{\frac{1}{2}}$ is the same as $\sqrt{4}$

$$8^{\frac{1}{3}} = \sqrt[3]{8} \qquad 81^{\frac{3}{4}} = \sqrt[4]{81^3} \qquad 81^{-\frac{3}{4}} = \frac{1}{\sqrt[4]{81^3}}$$

In general:



Ex.1 Write in radical form, then evaluate *without* using a calculator.

a) $36^{\frac{1}{2}}$ b) $27^{-\frac{1}{3}}$ c) $8^{-\frac{2}{3}}$ d) $16^{\frac{3}{4}}$

Ex.2 Write each root as a power with a rational exponent.

a) $\sqrt[3]{27}$ b) $(\sqrt[4]{16})^3$ c) $(\sqrt[3]{81})^{-2}$

Ex.3 Write as a single power, then evaluate.

a) $\frac{\sqrt{16}}{\sqrt{2}}$ b) $\frac{\sqrt{8}}{\sqrt{4}}$

Worth remembering:

$$\begin{array}{lll} 1^2 = 1 & 1^3 = 1 & 1^4 = 1 \\ 2^2 = 4 & 2^3 = 8 & 2^4 = 16 \\ 3^2 = 9 & 3^3 = 27 & 3^4 = 81 \\ 4^2 = 16 & 4^3 = 64 & 4^4 = 256 \\ 5^2 = 25 & 5^3 = 125 & 5^4 = 625 \\ 10^2 = 100 & 10^3 = 1000 & 10^4 = 10000 \end{array}$$

Ex.4 Evaluate, *without* using a calculator.

a) $81^{\frac{1}{4}}$

b) $(-8)^{\frac{1}{3}}$

c) $64^{-\frac{1}{2}}$

d) $(-100\,000)^{-\frac{1}{5}}$

e) $8^{\frac{2}{3}}$

f) $16^{-0.75}$

g)
$$\frac{\left(16^{\frac{7}{8}}\right)\left(16^{-\frac{1}{4}}\right)}{16^{\frac{1}{8}}}$$

Are there any Homework Questions you would like to see on the board?

Last day's work: **READ p.221**

pp. 221-223 #(1 – 9)ace, 11b, 13acegi, 16ace

READ p.228

Today's Homework Practice includes:

pp. 229-230 #(1 – 6)ace, 8 – 11, 12ace, 14 [16]