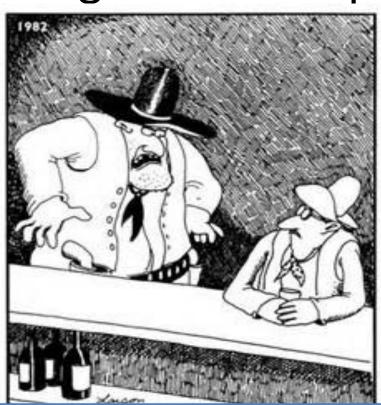
# Lesson 1.1.1 – Defining, Rewriting and Evaluating Rational Exponents



"I asked you a question buddy, WHAT IS THE SQUARE ROOT OF 5286?"

## By the end of this lesson, I will be able to answer the following questions...

- 1. What is a power and a root? What is their relationship?
- 2. What are the rules for operations with exponents?
- 3. How/When do I use a calculator to evaluate powers and roots?

### Vocabulary

- Exponential Expressions
  - Base
  - Exponent (power)

base exponent

- Radical Expressions
  - Radical sign
  - Root
  - Radicand

• The implied "2" when no root is given

$$\sqrt{x}$$
 implies  $\sqrt[2]{x}$ 

## Prerequisite Skills with Practice

Evaluate without a calculator.

$$\sqrt{16}$$

$$\left(\frac{2}{3}\right)\left(\frac{4}{5}\right)$$

$$(2-5)^2 - 3(4-5)^3$$

Use a calculator to evaluate the following. Round to the nearest hundredth.

$$\sqrt{17}$$

$$\sqrt[4]{23}$$

$$7^{\frac{2}{3}}$$

#### **Example one**

How can the expression

 $3^{\frac{6}{5}}$  be rewritten using roots

and powers?

#### **Example two**

How can the expression

 $\sqrt[8]{a^c}$  be rewritten using a

rational exponent?

#### **Example three**

Evaluate the exponential expression w/o a calculator.

 $3^{\frac{2}{3}}$   $\sqrt[4]{8^{\frac{2}{3}}}$ 

#### **Example four**

Evaluate the expressions

$$\sqrt{-25}$$
 and  $\sqrt{25}$ 

Round to the thousandth.

Based on the definition of a root, why are the answers so different?

#### **Example five**

When to use a calculator and and when to evaluate by hand.

$$125^{\frac{2}{3}}$$
  $100^{\frac{2}{3}}$ 

$$\sqrt[5]{32}$$
  $\sqrt[3]{16}$ 

## THE END



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