

## UNIT 3 LESSON 3

### RATIONAL EXPONENTS

#### Rational Exponents

Rational (fractional) exponents are an alternate way to write roots!

---

$$x^{\frac{m}{n}} = \sqrt[n]{x^m}; n \neq 0$$

NUMERATOR = exponent

DENOMINATOR = index

Ex 1) Write expression in exponential form  $\sqrt[8]{a^c}$

Exponential Form  $\rightarrow x^{\frac{m}{n}}$

'x' is the base

'm' is the numerator/exponent

'n' is the denominator/index

For this problem  $\rightarrow$  'a' is the base

'c' is the numerator/exponent

'8' is the denominator/index

Answer:  $\sqrt[8]{a^c} = \boxed{a^{\frac{c}{8}}}$

Ex 2) Write expression in radical form

$$3^{\frac{6}{5}}$$

Radical Form  $\rightarrow \sqrt[n]{x^m}$

'x' is the base

'm' is the numerator/exponent

'n' is the denominator/index

For this problem  $\rightarrow$  '3' is the base

'6' is the numerator/exponent

'5' is the denominator/index

Answer:  $3^{\frac{6}{5}} = \boxed{\sqrt[5]{3^6}}$

Ex 3) Evaluate the expression  $\sqrt[8]{4^{10}}$ . Round the answer to the nearest thousandth.

1) Evaluate the power

$$4^{10} = 1,048,576$$

2) Find the root

$$\sqrt[8]{1,048,576} \approx 5.657$$

---

Use the calculator to perform both steps

① Math button

② Option #5