**Unit 2 #3 RATIONAL EXPONENTS & LOGARITHMS**

**RATIONAL EXPONENTS**

Finding a root of a number is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ operation of raising a number to a power.

This symbol is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or the radical sign.

 The expression under the radical sign is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_

 defines the root to be taken.

SQUARE ROOTS $\sqrt[2]{a}$ Examples:

A square root of any **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** number has two 1. $\sqrt{100}$ = 2. $\sqrt{\frac{25}{49}}$ =

roots. One is \_\_\_\_\_\_\_\_\_\_\_ and the other is \_\_\_\_\_\_\_\_\_\_\_\_\_.

CUBED ROOTS $\sqrt[3]{a}$ Examples:

A cube root of any \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ number is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. 1. $\sqrt[3]{27}$ =

2. $\sqrt[3]{\frac{125}{64}}$ = 3. $\sqrt[3]{x^{3}}=$ 4. $\sqrt[3]{x^{12}}=$

nth ROOTS $\sqrt[n]{a}$ Examples:

An nth root of any number \_\_\_\_\_\_\_\_ is a number whose 1. 34 = 2. $\sqrt[4]{81}= $

\_\_\_\_\_\_ power is *\_\_\_\_\_\_\_\_*.3. 24 = 4. $\sqrt[4]{16}=$

 5. (-2)5 = 6. $\sqrt[5]{-32}=$

RATIONAL EXPONENTS



The value of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ represents the power of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

The value of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ represents the \_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_ of the expression.

Examples:

$25^{\frac{1}{2}}$ 🡪

$4^{\frac{3}{2}}$ 🡪

$(2x+1)^{\frac{2}{7}}$ 🡪

**LOGARITHMS**

Definition of Logarithm: Suppose \_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_, there is a number ‘p’ such that:

*If and only if*

**Example & Practice Problems** Write the Write the following exponential equations in logarithmic form.

1. 23 = 8 2. 42 = 16 3. 2-3 = $\frac{1}{8}$ 4. 72 = 49 5. 50 = 1 6. 10-2 = $\frac{1}{100}$

**Example & Practice Problems** Write the following logarithmic equations in exponential form.

1. log3 81 = 4 2. log2 $\frac{1}{8}$ = -3 3. log10 100 = 2 4. log5 $\frac{1}{125}$ = -3 5. log27 3 = $\frac{1}{3}$

**Example Problems:** Solve the following for the variable.

1. Solve for x: log6 x = 2 2. Evaluate. log3 27 = y