

2.2

Exponents

$$x^4 = x \cdot x \cdot x \cdot x$$

$$2^4 = 2 \cdot 2 \cdot 2 \cdot 2$$

16

$$a^0 = 1$$

$$5^0 = 1$$

0⁰ undefined

$$10^3 = 1,000$$

$$10^2 = 100$$

$$10^1 = 10$$

$$10^0 = 1$$

$$10^{-1} = .1 \quad \frac{1}{10} \quad \frac{1}{10^1}$$

$$10^{-2} = .01 \quad \frac{1}{100} \quad \frac{1}{10^2}$$

$$10^{-3} = .001 \quad \frac{1}{1000} \quad \frac{1}{10^3}$$

$$10^{-4} = .0001 \quad \frac{1}{10,000} \quad \frac{1}{10^4}$$

$$10^{-5} = .00001 \quad \frac{1}{100,000} \quad \frac{1}{10^5}$$

$$a^{-n} = \frac{1}{a^n}$$

x⁻¹ Calc

$$\boxed{2} \boxed{x^{-1}} = \frac{1}{2^1} = \frac{1}{2}$$

$$(2^3)(2^4) \quad 2^7$$

$$(2 \cdot 2 \cdot 2)(2 \cdot 2 \cdot 2 \cdot 2)$$

$$(8)(16)$$

$$\frac{416}{8}$$

128

Product of Powers
 Multiplication of Like Bases

$$a^m \cdot a^n$$

$$a^{m+n}$$

$$2^3 \cdot 2^4$$

$$2^7$$

$(2^3)^4$ Multiply Exponents

$$2^{12}$$

$$4096$$

$$\sqrt[4]{2^3 \cdot 2^3 \cdot 2^3 \cdot 2^3}$$

$$2^{3+3+3+3}$$

$$2^{12}$$

Power of a Power

$$(a^m)^n$$

$$a^{mn}$$

$$(2x^3)^4$$

$$16x^{12}$$

$$2(x^3)^4$$

$$2x^{12}$$

$$(3st^{12})^3$$

$$27s^3t^{36}$$

$$4(3st^{12})^3$$

$$4(27s^3t^{36})$$

$$108s^3t^{36}$$

$$4s(3st^{12})^3$$

$$4s(27s^3t^{36})$$

$$108s^4t^{36}$$

$$3s + (3st^{12})^3$$

$$3s + 27s^3t^{36}$$

$$27s^3t^{36} + 3s$$

$$3s + 3s$$

$$6s$$

$$3s(3s)$$

$$9s^2$$

$$x + x$$

$$2x$$

$$x(x)$$

$$x^2$$

$$5 + 5$$

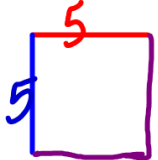
$$2(5)$$

$$10$$

$$5(5)$$

$$25$$

$$\begin{array}{c} \color{red}{5} \quad \color{blue}{5} \\ \hline 10 \end{array}$$



$$A = 25$$

$$\frac{2^5}{2^3}$$

Quotient of Powers
Division of Like Bases

$$2^2$$

$$\frac{2 \cdot 2 \cdot 2 \cdot 2 \cdot 2}{2 \cdot 2 \cdot 2}$$

$$\frac{32}{8}$$

$$\frac{2^2}{4}$$

$$\frac{a^m}{a^n}$$

$$\frac{2^5}{2^3}$$

$$a^{m-n}$$

$$\rightarrow 2^2$$

Numerator

$$\frac{2^{-3}}{2^{-5}}$$

$$\frac{3^{-5}}{3^4}$$

$$2^{-3+5}$$

$$3^{-5-4}$$

$$2^2$$

$$\text{Numerator } 2^{-9}$$

$$4$$

$$\frac{1}{3^9}$$

$$\frac{1}{19683}$$

$$5^{\frac{2}{3}}$$

$$49^{\frac{1}{2}}$$

$$\sqrt[3]{5^2}$$

$$\sqrt[2]{49^1}$$

Same

$$7$$

$$(\sqrt[3]{5})^2$$

$$64^{\frac{4}{3}}$$

$$\sqrt[3]{64^4}$$

$$(\sqrt[3]{64})^4$$

$$(4)^4$$

$$256$$