2.2

Exponents

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

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

16

$a^0 = 1$

$5^0 = 1$

0^0 undefined

$10^3 = 1{,}000$

$10^2 = 100$

$10^1 = 10$

$10^0 = 1.$

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

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

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

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

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

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

x^{-1} Cale

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

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

$(2\cdot2\cdot2)(2\cdot2\cdot2\cdot2)$

$(8)(16)$

128

$\begin{array}{r} 4\,|\,6 \\ 8 \\ \hline 128 \end{array}$

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

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

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

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

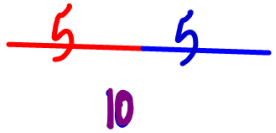
$5 + 5$

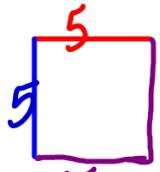
$2(5)$

10

$5(5)$

25





A= 25

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

Quotient of Powers
Division of Like Bases

2^2

4

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

$\frac{32}{8}$

4

2^2

4

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

a^{m-n}

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

2^2

Numerator

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

2^{-3+5}

2^2

4

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

3^{-5-4}

3^{-9}

Numerator

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

$\frac{1}{19683}$

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

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

Same

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

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

$\sqrt{49^1}$

7

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

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

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

$(4)^4$

256