

July 14, 2015

Quotient Rule  $\rightarrow$  Negative Exponents

$$\frac{x^2}{x^3} = \frac{\cancel{x} \cdot \cancel{x} \cdot \boxed{1}}{\cancel{x} \cdot \cancel{x} \cdot x} = \boxed{\frac{1}{x}}$$

Same Base  $\leftarrow \frac{x^2}{x^3} = x^{2-3} = x^{-1} = \boxed{x^{-1}}$

Generally

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

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$$2^{-5} = \frac{1}{2^5} = \boxed{\frac{1}{32}}$$

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$2^0 = 1$  why? Quotient Rule

$$\frac{x^2}{x^2} = \frac{\cancel{x} \cdot \cancel{x}}{\cancel{x} \cdot \cancel{x}} = \boxed{1}$$

$$x^{2-2} = x^0 = \boxed{x^0}$$

More Generally then

\* Anything to the zero power is "one".

$\text{☺} = 1$

$2^1 = 2$   
 $2^2 = 4$   
 $2^3 = 8$   
 $\vdots$

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Scientific Notation

- Used to write numbers that are very large or very small.

\* A scientific Number

$$0 \leq a < 10$$

- greater than or equal to zero, but less than 10.

e.g.

3.45000000  $\rightarrow$  Standard Form

Moved the decimal Point 8 times to the left.

$$0 \leq \boxed{3.45} < 10 \text{ times}$$

$a$

$$\boxed{3.45 \times 10^8}$$

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Convert from Standard Form to Scientific

0.0000000000000003.74

15 times

$$\boxed{3.74 \times 10^{-15}}$$

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$$\boxed{6.2 \times 10^{-2}}$$

$$6.2 \times \frac{1}{10^2}$$

$$\frac{6.2}{1} \times \frac{1}{100}$$

$$\frac{6.2}{100} = \boxed{0.062}$$

S.S.

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$9.3826000000000000$   
 13 times  
 $9.3826 \times 10^{13}$  S.N.  
 $2.9 \times 10^{-7}$   
 $\downarrow$   
 $0.00000029$   
 $0.00000029$  S.Z

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$(3.4 \times 10^5) \cdot (6.1 \times 10^3)$   
 $3.4 \times (10^5 \cdot 6.1) \times 10^3$  assoc.  
 $3.4 \times (6.1 \cdot 10^5) \times 10^3$  Comm  
 $(3.4 \times 6.1) \cdot (10^5 \times 10^3)$  assoc.  
 $\begin{array}{r} 3.4 \\ 6.1 \\ \hline 20.74 \end{array}$   
 $20.74 \times 10^{5+3}$  Same base  
 $20.74 \times 10^8$   
 $2.074 \times 10^9$

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$(1.7 \times 10^{-6}) \cdot (8.3 \times 10^9)$   
 $(1.7 \times 8.3) \cdot (10^{-6} \cdot 10^9)$   
 $\begin{array}{r} 8.3 \\ 1.7 \\ \hline 581 \\ 830 \\ \hline 14.11 \end{array}$   
 $14.11 \times 10^{-6+9} = 3$   
 $14.11 \times 10^3$   
 $1.411 \times 10^4$   
 $\downarrow$   
 $1.411 \text{ EE } 4$

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$2.6 \text{ EE } -14$   
 $\downarrow$   
 $2.6 \times 10^{-14}$

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Exam #2 - Thursday  
 • 6.1 - 6.5  
 • Exam #1

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$a(b+c) = ab + ac$   
 $3(a+4) = 3a + 12$   
 $2x - 6y$   
 $2x - (2 \cdot 3)y$   
 $2(x - 3y)$

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Multiplicative Inverse

$$\frac{8}{1} \cdot \boxed{\frac{1}{8}} = 1$$

$$\frac{8}{8} = 1$$

$$\frac{3x}{3} = \frac{12}{3}$$

$$\boxed{\frac{1}{3} \cdot \frac{3}{1}} \cdot \frac{x}{1} = \frac{12}{1} \cdot \frac{1}{3}$$

$$\textcircled{1} \cdot x = \frac{4 \cdot \cancel{3} \cdot \cancel{1}}{1 \cdot \cancel{3}}$$

Mult Identity  $x = 4$

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$$\frac{2x}{2} = \frac{4}{2}$$

$$x = 2 \text{ m.d.}$$


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$$\begin{array}{r} 2 + x = 4 \\ -2 \quad 0 \quad -2 \\ \hline 0 + x = 2 \\ x = 2 \text{ A.d.} \end{array}$$

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Additive Identity

$$a + 0 = a$$

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Equality is two things having equivalent value

$$x = y$$

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