

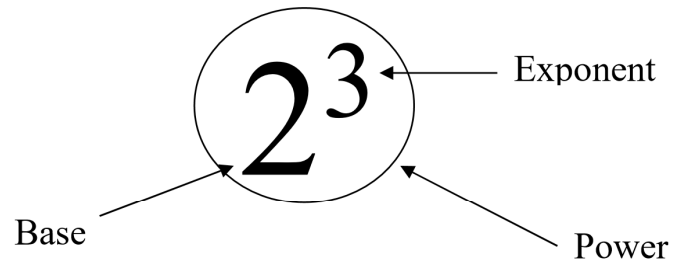
L4 Exponent Review

Wednesday, October 5, 2022 8:29 AM



L4 Exponent Review new

Lesson 4 Exponent Review



Exponent Laws

Product Law

$$a^m \cdot a^n = a^{m+n}, a \neq 0$$

** add exponents*

Example 1

$$x^3 \cdot x^4 = x^7$$

Example 2

Simplify.

a) $x^5 \cdot x^2 \cdot x^1$

$$x^8$$

b) $(-2)^3 \cdot (-2)^7$

$$(-2)^{10}$$

** Keep the same base,
add exponents*

c) $(x^2y)(x^3y^6)$

$$x^5y^7$$

Quotient Law

$$\frac{a^m}{a^n} = a^{m-n}, a \neq 0$$

* subtract exponents

Example 3

$$\frac{3^8}{3^6} = 3^2$$

Example 4

$$\text{a) } \frac{x^{17}}{x^5} = x^{12}$$

$$\text{b) } \frac{(-5)^{11}}{(-5)^5} = (-5)^6$$

$$\text{c) } 16x^4y^3 \div 8x^3y$$

$$\text{or } \frac{16x^4y^3}{8x^3y} = 2xy^2$$

Power Law

$$(a^m)^n = a^{mn}$$

* multiply exponents

Example 5

$$(2^3)^2 =$$

$$2^6$$

Example 6

a) $(x^{13})^4$ $\times 52$

b) $((x^3)^2)^5$ $\times 3 \cdot 2 \cdot 5$
 \times^{30}

Product to a Power

$$(ab)^n = a^n \cdot b^n$$

apply exponent to each part of the product

Example 7

$$(xy)^3 = x^3 y^3$$

Example 8

a) $(-2xy)^2 = 4x^2 y^2$
 $(-2xy)(-2xy)$

b) $(-4p^3 q^2)^3$
 $-64 p^9 q^6$

$$\begin{aligned} &(-4)(-4)(-4) \\ &16(-4) \\ &-64 \end{aligned}$$

Fraction to a Power

$$\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}, b \neq 0$$

Example 9

$$\left(\frac{2}{3}\right)^2 = \frac{2^2}{3^2} = \frac{4}{9}$$

Example 10

$$a) \left(\frac{2x}{3y}\right)^2 \quad \frac{4x^2}{9y^2}$$

$$b) \left(\frac{1}{2x}\right)^5 \quad \frac{1}{32x^5}$$

Zero Power Law

$$a^0 = 1, a \neq 0$$

Example 11

$$4^0 = 1$$

Example 12

$$a) (6x)^0 = 1$$

$$b) 6x^0 \leftarrow \text{exponent only applies to } x$$

$$6(1)$$

$$6$$

Example 13

$$\frac{(2a^3b^2)^3(2ab^4c^4)}{-4abc^2}$$

$$\frac{(8a^9b^6)(2ab^4c^4)}{-4abc^2}$$

$$\frac{16a^{10}b^{10}c^4}{-4abc^2}$$

$$-4a^9b^9c^2$$