

REVIEW: Powers

October-31-13

11:03 AM

Exponent Laws:

Multiplying

↳ ADD the exponents

$$a^m \times a^n = a^{m+n}$$

Dividing

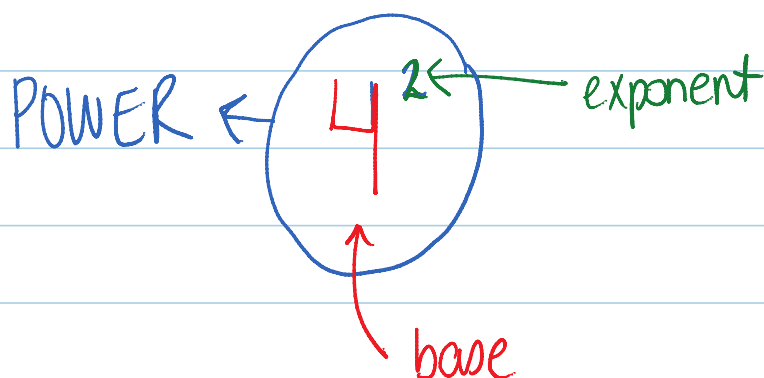
↳ SUBTRACT the exponents

$$a^m \div a^n \text{ or } \frac{a^m}{a^n} = a^{m-n}$$

Power of a Power

↳ MULTIPLY the exponents

$$(a^m)^n = a^{m \times n}$$



Ex. #1

$$\begin{aligned} \text{(a.) } (-2)^3 & \\ &= (-2)(-2)(-2) \\ &= -8 \end{aligned}$$

$$\begin{aligned} \text{(b.) } -2^3 & \\ &= -2 \times 2 \times 2 \\ &= -8 \end{aligned}$$

$$\begin{aligned} \text{(c.) } -(2)^3 & \\ &= -(2 \times 2 \times 2) \\ &= -8 \end{aligned}$$

$$\begin{aligned} \text{(d.) } (-3)^2 & \\ &= (-3)(-3) \end{aligned}$$

$$\begin{aligned} \text{(e.) } -3^2 & \\ &= -3 \cdot 3 \end{aligned}$$

$$\begin{aligned} \text{(f.) } -(3)^2 & \\ &= -(3 \cdot 3) \end{aligned}$$

$$\begin{aligned} \text{(d.) } (-5) & \\ &= (-3)(-3) \\ &= 9 \end{aligned}$$

$$\begin{aligned} \text{(e.) } -5 & \\ &= -3 \times 3 \\ &= -9 \end{aligned}$$

$$\begin{aligned} \text{(f.) } -(5) & \\ &= -(3 \times 3) \\ &= -9 \end{aligned}$$

Ex. #2

$$\begin{aligned} \text{(a.) } \frac{4^3}{4^2} & \\ &= 4^{3-2} \\ &= \boxed{4} \end{aligned}$$

$$\begin{aligned} \text{(b.) } \frac{2^2 \times 2}{2^4} & \\ &= \frac{2^{2+1}}{2^4} \\ &= \frac{2^3}{2^4} = 2^{3-4} \\ &= \boxed{2^{-1}} \end{aligned}$$

$$\begin{aligned} \text{(c.) } 2^2 + 3^2 & \\ &= 4 + 9 = \boxed{13} \end{aligned}$$

Zero Exponent Law

↳ anything to the power of 0 = 1 $a^m = a^0 = 1$

Negative Exponent Law

↳ make it into a fraction

↳ change your exponent to a positive

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

Ex. #3

$$\begin{aligned} \text{(a.) } 412^0 & \\ &= 1 \end{aligned}$$

$$\begin{aligned} \text{(b.) } 80^0 & \\ &= 1 \end{aligned}$$

$$\begin{aligned} \text{(c.) } 4,312,612,432^0 & \\ &= 1 \end{aligned}$$

$$(d.) 8^{-2}$$

$$= \frac{1}{8^2}$$

$$= \frac{1}{64}$$

$$(e.) (2 \times 3)^{-2}$$

$$= (6)^{-2}$$

$$= \frac{1}{6^2}$$

$$= \frac{1}{36}$$

$$(f.) (-3)^4 \times 4^{-2}$$

$$= 81 \times \frac{1}{4^2}$$

$$= \frac{81}{4^2}$$

$$= \frac{81}{16} = 5 \frac{1}{16}$$