

## Section 2.5: Exponent Laws Part 2

└─ « Power of a Power  
 « Power of a Product

Power  $\longrightarrow$  repeated multiplication

What is the difference between:

$(3^2)^4$  Power of a power

$$\begin{aligned} &\uparrow \\ &= (3^2)(3^2)(3^2)(3^2) \\ &= (3 \times 3)(3 \times 3)(3 \times 3)(3 \times 3) \\ &= 3^8 \end{aligned}$$

$(3 \times 2)^2$  Power of a product

$$\begin{aligned} &\uparrow \\ &= (3 \times 2)(3 \times 2) \\ &= 3 \times 3 \times 2 \times 2 \\ &= 3^2 \times 2^2 \end{aligned}$$

### Exponent Law for a Power of a Product

$$\longrightarrow (a \times b)^m = a^m \times b^m \quad \text{or} \quad (ab)^m = a^m b^m$$

### Exponent Law for a Power of a Power

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

**Example:** Use the laws of exponents to simplify and evaluate.

1.  $(2^3)^2$

2.  $(2 \times 3)^2$

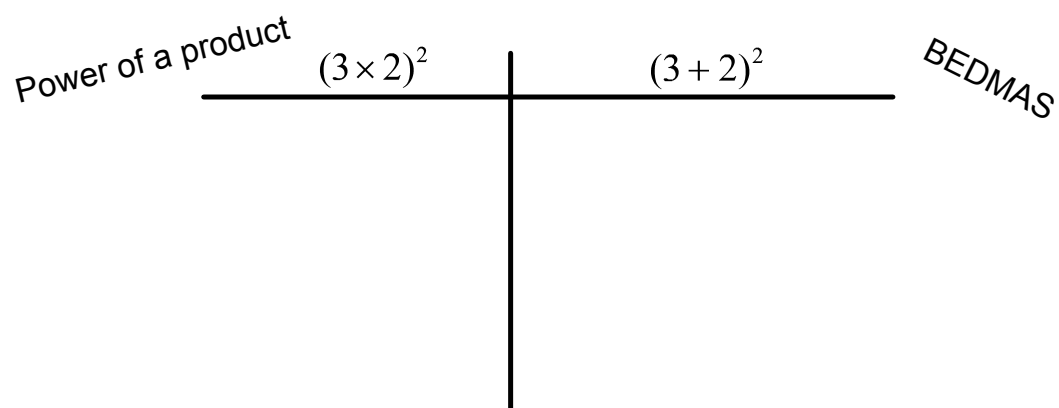
3.  $[(-3)^2]^2$

4.  $-[-3^2]^2$

5.  $(3^2 \times 3^8) \div (3^3)^2$

6.  $(2^3 \times 2^2)^3 - (3^2 \times 3)^2$

Compare the following example when using the law of exponents



**Exponent Law: Power of a Quotient**

↳ To find the power of a quotient, you keep the bases the same but raise each base to the same exponent.

$$\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$$

Example 7:  $\left(\frac{5}{6}\right)^3$

Write as a single power

Example 8 :  $\left(\frac{3}{4}\right)^3$

Example 9: Use + , - , x , ÷ to complete this equation:

$$5^2 \quad \underline{\quad} \quad 16 \quad \underline{\quad} \quad 2^2 \quad \underline{\quad} \quad 6 = 83$$

Work Sample Questions	Extra Practice Questions
p. 84-85: # 4ace, 5ace, 6aef, 8ace, 9, 11, 14aceg, 15, 16ace, 17ace, 19ace	p. 84-85: # 4bdf, 5bdf, 6bcd, 8bdf, 14bdfh, 16bdf, 17bdf, 19bdf

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