

## Exponent Review- Remember two things:

1. You never multiply a base by its exponent. The exponent tells you how many times to multiply the base by itself. \*  $4^3$  is NOT  $4 \times 3$ . It is  $4 \times 4 \times 4 = 64$
2. If a base is negative, it must be in parentheses to use it when you multiply. Otherwise, your answer will always be negative.

\*  $(-3)^4$  means \_\_\_\_\_

\*  $-3^4$  means \_\_\_\_\_

**YOUR TURN: Evaluate the exponential expression.**

1.  $5^3 =$  \_\_\_\_\_

2.  $\left(\frac{2}{3}\right)^3 =$  \_\_\_\_\_

3.  $(-6)^3 =$  \_\_\_\_\_

4.  $9^3 =$  \_\_\_\_\_

5.  $-2^2 =$  \_\_\_\_\_

6.  $1.1^3 =$  \_\_\_\_\_

## RULES OF EXPONENTS

### Rule 1: Product of Powers

$$a^m \cdot a^n = \underline{\hspace{2cm}}$$

When \_\_\_\_\_ exponents with the same base, \_\_\_\_\_ the exponents.

Ex:  $4^3 \cdot 4^2 =$  \_\_\_\_\_ Why?

**YOUR TURN: Simplify using exponents in your answer.**

1)  $3^2 \cdot 3^5 =$  \_\_\_\_\_

2)  $(-4)^3 \cdot (-4)^8 =$  \_\_\_\_\_

3)  $(4)(4^6) =$  \_\_\_\_\_

4)  $(-5)^7 \times (-5)^3 \times (-5)^2 =$  \_\_\_\_\_

### Rule 2: Quotient of Powers

$$\frac{a^m}{a^n} = \underline{\hspace{2cm}}$$

When \_\_\_\_\_ exponents with the same base, \_\_\_\_\_ the exponents.

Ex:  $\frac{3^6}{3^4} =$  \_\_\_\_\_ Why?

**YOUR TURN: Simplify using exponents in your answer.**

1)  $\frac{6^9}{6^5} =$  \_\_\_\_\_

2)  $\frac{(-18)^{10}}{(-18)^2} =$  \_\_\_\_\_

3)  $10^8 \div 10^4 =$  \_\_\_\_\_

4)  $9^5 \div 9 =$  \_\_\_\_\_

**Rule 3: Power of a Power**  $(a^m)^n = \underline{\hspace{2cm}}$

When finding the **power of a power**,  $\underline{\hspace{2cm}}$  the exponents.

Ex:  $= (6^3)^4 = \underline{\hspace{2cm}}$  Why?

**YOUR TURN: Simplify using exponents in your answer.**

1)  $(8^4)^3 = \underline{\hspace{2cm}}$                       2)  $(15^2)^8 = \underline{\hspace{2cm}}$

3)  $[(-4)^6]^2 = \underline{\hspace{2cm}}$                       4)  $(9^3)^5 = \underline{\hspace{2cm}}$

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**REVIEW:**

1)  $(-15)^6 \cdot (-15)^3 \cdot (-15) = \underline{\hspace{2cm}}$                       2)  $[(-8)^7]^6 = \underline{\hspace{2cm}}$

3)  $\frac{(-5)^8}{(-5)^3} = \underline{\hspace{2cm}}$                       4)  $(7^8)^2 = \underline{\hspace{2cm}}$

5)  $(4^1)^5 = \underline{\hspace{2cm}}$                       6)  $3^4 \cdot 3^6 = \underline{\hspace{2cm}}$

7)  $6^5 \times 6^2 = \underline{\hspace{2cm}}$                       8)  $\frac{10^{12}}{10^4} = \underline{\hspace{2cm}}$

9)  $(-12)^{10} \div (-12)^2 = \underline{\hspace{2cm}}$                       10)  $8^5 \times 8 = \underline{\hspace{2cm}}$

**Challenge:**

11)  $\frac{10^2 \times 10^6}{10^7} = \underline{\hspace{2cm}}$                       12)  $\frac{5^4 \cdot 5^6}{5^4} = \underline{\hspace{2cm}}$

13)  $\frac{7^5 \times 7^3}{7 \times 7^2} = \underline{\hspace{2cm}}$                       14)  $\frac{4^7 \cdot 4^3}{4^8 \div 4^2} = \underline{\hspace{2cm}}$

15)  $\frac{(3^6)^2}{(3^3)^4} = \underline{\hspace{2cm}}$                       16)  $\frac{2^8 \cdot 2^3 \times 2}{2^6 \cdot 2^3 \cdot 2^2} = \underline{\hspace{2cm}}$