

EXPONENTS

Exponents are used in math to signify repeated multiplication. They are written as superscript numbers to the right side of the base:

$$\text{base}^{\text{exponent}}$$

| <u>Multiplication</u> | <u>Exponents</u> |
|--|---|
| $2 \cdot 3 = 2 + 2 + 2 = 6$ <i>The 3 specifies how many times to add 2 to itself.</i> | $2^3 = 2 \cdot 2 \cdot 2 = 8$ <i>The 3 specifies how many times to multiply 2 by itself.</i> |

Bases that are **variables**, such as x or y , are treated the same way:

$$x \cdot x \cdot x \cdot x = x^4$$

In more complex equations, pay attention to how terms are **grouped**, because it will affect the outcome. The **order of operations** will also determine the outcome.

| | |
|---|--|
| $7 + 3^3 = 7 + (3 \cdot 3 \cdot 3) = 7 + 27 = 34$ while $(7 + 3)^3 = 10^3 = 10 \cdot 10 \cdot 10 = 1,000$ | - Exponents, then addition _____ - Parentheses, then exponents |
| $-5^2 = -1 \cdot 5^2 = -1 \cdot 5 \cdot 5 = -25$ while $(-5)^2 = (-1 \cdot 5)^2 = (-1 \cdot 5) \cdot (-1 \cdot 5) = 25$ | - Exponents, then multiplication _____ - Parentheses, then exponents |
| $y - 4^2 = y - 16$ while $(y - 4)^2 = (y - 4) \cdot (y - 4) = y^2 - 8y + 16$ | - Exponents, then subtraction _____ - Parentheses, then exponents |

