Curriculum Outcome

(N1) Demonstrate an understanding of powers with integral bases (excluding base 0) and whole number exponents by: representing repeated multiplication using powers; using patterns to show that a power with an exponent of zero is equal to one; solving problems involving powers.

(N2) Demonstrate an understanding of operations on powers with integral bases (excluding base 0) and whole number exponents.

Student Friendly:
“What does an exponent do to a number"

Chapter 2

$4a^2b^3$

$(3a^2)^3$

POWERS

$-(a^2)^3$

5^3

$25^{\frac{1}{2}}$


Power
exponent
8
3
base

Exponents

Exponents are shorthand for multiplication:
$(5)(5) = 5^2$, $(5)(5)(5) = 5^3$.

The "exponent" stands for however many times the term is being multiplied.

Exponent → 5^3

(3 times) $5 \times 5 \times 5 = 125$

The term that's being multiplied is called the "base".

Base → 5^3

Write each as a product, then evaluate.

#1

a) 3^4

$3 \times 3 \times 3 \times 3$

$= 81$

b) 5^3

$5 \times 5 \times 5$

$= 125$

c) $\left(\frac{2}{3}\right)^3$

$\left(\frac{2}{3}\right)\left(\frac{2}{3}\right)\left(\frac{2}{3}\right)$

$= \frac{8}{27}$

Write each as a power, then evaluate.

#2

a) (4)(4)(4)

4^3

= 64

b) (-6)(-6)(-6)(-6)(-6)

$(-6)^5$

= -7776

Powers with a Twist

Can you see the difference?

$(-4)^2$

Expanded: (-4)(-4)

Evaluated: 16

Base: (-4)

Exponent: 2

-4^2

Expanded: - (4)(4)

Evaluated: 16

Base: 4

Exponent: 2

You Try!!!

$-(-2)^3$

Base: (-2)

Exponent: 3

-2^5

Base: 2

Exponent: 5

$(-1)^2 = 1$

$(-1)^3 = -1$

$(-1)^4 = 1$

$(-1)^5 = -1$

$(-1)^6 = 1$

$(-1)^7 = -1$

Did you see a pattern??

$(-1)^{10247} = -1$ $(-1)^{29584} = 1$

$(-1)^{10247} = -1$ $(-1)^{29584} = 1$

Evaluating powers when the base is negative...

If the exponent is **even** the answer will be **positive**.

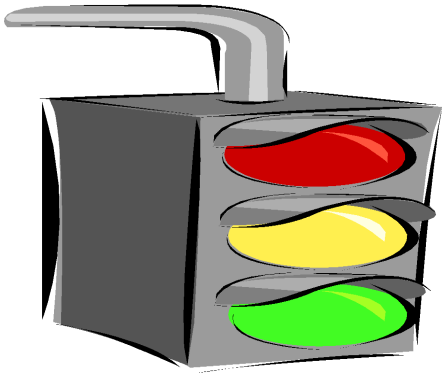
If the exponent is **odd** the answer will be **negative**.

Figure out if the answer is positive or negative: (Explain)

$$\frac{(-2)^{52} \times (-6)^{31}}{-(-4)^{6}} = \frac{(+)\ (-)}{(-)\ (+)} = \frac{(-)}{(-)} = (+)$$

Figure out if the answer is positive or negative: (Explain)

$$\frac{-(-x)^4 \, x \;\; (-y)^{12}}{-z^2(-xy)^5} = \frac{(-)(+)(+)}{(-)(+)\,(-)} = \frac{(-)}{(+)} = (-)$$



Class/Homework

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Questions

7ace,8ace,9, 11, 12,

13,14, 15,16,