

U1D2-T Order of Operations

Saturday, January 27, 2018 4:27 PM



U1D2-T
Order of ...

U1D2 Order of Operations

When simplifying expressions, we must always follow the 'Order of Operations'.

Brackets

Exponents

Division

Multiplication

Addition

Subtraction

> in order
left to right

> in order
left to right

Is the acronym to help us remember the correct order.

Example 1: Evaluate.

a) $(8 - 3) + (1 - 6)$

$$= 5 + (-5)$$

$$= 5 - 5$$

$$= 0$$

b) $-(4 - 9) - (14 - 4)$

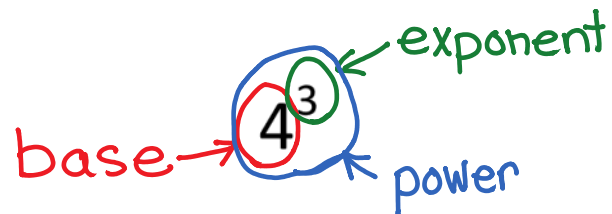
$$= -(-5) - 10$$

$$= 5 - 10$$

$$= -5$$

$$\begin{aligned}
 \text{c) } & (4)(-1) + (7 - 2) \\
 & = (4)(-1) + 5 \quad \leftarrow \\
 & = -4 + 5 \\
 & = 1
 \end{aligned}$$

Working with Exponents



Example 2: Evaluate.

$$\begin{aligned}
 \text{a) } & 5^2 \\
 & = 5 \times 5 \\
 & = 25
 \end{aligned}$$

$$\begin{aligned}
 \text{b) } & (-4)^2 \\
 & = (-4)(-4) \\
 & = 16
 \end{aligned}$$

$$\begin{aligned}
 \text{c) } & -4^2 \text{ (OR) } -(4)^2 \\
 & = -4 \times 4 \\
 & = -16
 \end{aligned}$$

$$\begin{aligned}
 \text{d) } & (-2)^3 \\
 & = (-2)(-2)(-2) \\
 & = 4(-2) \\
 & = -8
 \end{aligned}$$

$$e) -3^2 = -9$$



$$f) -0.3^3 \quad (\text{Remember: no calculator})$$

$$\begin{array}{r} -2.7 \\ -0.27 \end{array}$$

$$= -\left(\frac{3}{10}\right)^3$$

$$= \frac{-3 \times 3 \times 3}{10 \times 10 \times 10}$$

$$\begin{array}{r} 0.3 \\ \times 0.3 \\ \hline 0.09 \\ \times 0.3 \\ \hline 0.27 \end{array}$$

$$= \frac{-27}{1000} = -0.027$$

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

NOTE: $-\frac{2}{3} = \frac{-2}{3} = \frac{2}{-3}$

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

$$\frac{-2}{-3} = \frac{2}{3} \neq -\frac{2}{3}$$

$$= \frac{2 \times 2}{3 \times 3}$$

$$= \frac{4}{9}$$

Example 3: Evaluate.

$$a) 3(-2 + 4)^3 - 2(-4 + 1)$$

$$= 3(2)^3 - 2(-3)$$

$$= 3(8) - 2(-3)$$

$$= 24 - (-6)$$

$$= 24 + 6$$

$$= 30$$

$$\text{b) } [(-15)-3] \times [(-12)-(-4)]$$

$$= (-15-3)(-12+4)$$

$$= (-18)(-8)$$

$$= 144$$

$$\frac{80}{64}$$

$$\text{c) } 2 \times 100 \div 10 \times 2$$

$$= 200 \div 10 \times 2$$

$$= 20 \times 2$$

$$= 40$$

$$\text{d) } \left[\frac{(-6+3)(13-9)}{(-1)(8-10)} \right]^2$$

$$= \left[\frac{(-3)(4)}{(-1)(-2)} \right]^2$$

$$= \left(\frac{-12}{2} \right)^2$$

$$= (-6)^2$$

$$= 36$$

$$e) \frac{3(9-4)(-2)(10-7)}{-(15-8)}$$

$$= \frac{3(5)(-2)(3)}{-7}$$

$$= \frac{5 \times 2 \times 3 \times 3}{7}$$

$$= \frac{90}{7}$$

even
number
of negatives
multiplied/divided
together so
answer is
positive.