

## Notes: Order of Operations with Integers, Decimals, and Fractions!

What classifies a value as an Integer?

NEGATIVE OR POSITIVE WHOLE NUMBER

What classifies a value as a Decimal?

THERE IS A DECIMAL POINT

What classifies a value as a Fraction?

$$\frac{\text{NUMERATOR}}{\text{DENOMINATOR}}$$
 ← FRACTION BAR IS DIVISION

Identify the following terms as an *Integer*, *Decimal*, or *Fraction*.

9	0.2	-10	100.02	$\frac{16}{3}$	100525	$-\frac{1}{6}$
I	D	I	D	F	I	F

## Reviewing basic operations

Simplify the following expressions. Check with the calculator! Simplify your answer.

$$10 - 15 = -5$$

$$10.5 - 15.6 = -5.1$$

$$\frac{1}{4} + \frac{1}{4} = \frac{2}{4} = \frac{1}{2}$$

$$\frac{3}{4} - \frac{5}{8} = \frac{6}{8} - \frac{5}{8} = \frac{1}{8}$$

*(Common Denominator)*

$$5.7 + 10.253 = 15.953$$

$$\frac{2}{5} * \frac{1}{2}$$

$$-\frac{3}{2} \div \frac{3}{1} = -\frac{3}{2} * \frac{1}{3}$$

*MULTIPLY BY RECIPROCAL*

$$5 \left( \frac{1}{3} \right) - \frac{5}{2}$$

$$\frac{1}{2} - \frac{5}{6} + \frac{1}{7} * \frac{5}{9} \div \frac{3}{6}$$

$$\frac{2}{10}$$

$$-\frac{3}{2} * \frac{1}{3} = -\frac{3}{6}$$

$$5 \left( \frac{1}{3} \right) - \frac{5}{2} = \frac{5}{3} - \frac{5}{2} = \frac{10}{6} - \frac{15}{6} = -\frac{5}{6}$$

*(Common Denominator)*

$$\frac{1}{2} - \frac{5}{6} + \frac{5}{63} \div \frac{3}{6}$$

$$\frac{1}{2} - \frac{5}{6} + \frac{5}{63} * \frac{6}{3}$$

$$\frac{1}{5}$$

$$-\frac{3}{6}$$

$$-\frac{1}{2}$$

FOLLOW ORDER OF OPERATIONS UNTIL COMPLETE.

# Order of Operations

What is our order of operations?

P	E	M	D	A	S
P A R E N T H E S I S	E X P O N E N T S	M U L T I P L Y	D I V I D E	A D D	S U B T R A C T

Lets think about why we follow the order of operations. Choose your **first step** for each problem. Focus on explaining WHY we made that choice.

$$2(6 - 2) + 6$$

$$2(4) + 6$$

PARENTHESES SAY  
DO THIS FIRST.

$$(5) + 9^2 - 11$$

$$5 + 81 - 11$$

EXPONENTS  
HAVE PRIORITY  
OVER OTHER OPERATIONS

$$\frac{40}{12+3^2}$$

$$\frac{-40}{12+9}$$

EXPONENTS

$$\nabla - \beta \left( \alpha + \varepsilon \left( \frac{\varphi}{\tau} + !^2 (N - \Sigma)^{33} \right) - Q \right)^E$$

NO MATTER THE NUMBER OR  
VARIABLE, FOLLOW ORDER OF OPERATIONS.

## Order of Operations Examples

$$5 \times 3 \times 2$$

$$15 \times 2$$

$$30$$

$$9 - 32 \div 4$$

$$9 - 8$$

$$1$$

$$5(10 - 1)$$

$$5(9)$$

$$45$$

$$9 + 8 + 7 + 6(3 - 1)$$

$$9 + 8 + 7 + 6(2)$$

$$9 + 8 + 7 + 12$$

$$15 + 7 + 12$$

$$22 + 12$$

$$34$$

$$9 + 8 + 7 + 6(3 - 1)^2$$

$$9 + 8 + 7 + 6(2)^2$$

$$9 + 8 + 7 + 6(4)$$

$$9 + 8 + 7 + 24$$

$$15 + 7 + 24$$

$$22 + 24$$

$$46$$

$$\frac{20}{(4 - (10 - 8))}$$

$$\frac{20}{(4 - (2))}$$

$$\frac{20}{2}$$

$$10$$

$$-4 + \frac{27}{2+3+2^2} + 3$$

$$-4 + \frac{27}{2+3+4} + 3$$

$$-4 + \frac{27}{9} + 3$$

$$-4 + 3 + 3$$

$$-1 + 3$$

$$2$$

COMPLETE THE  
TOP THEN THE  
BOTTOM, THEN  
DIVIDE.

$$(-6 - 4) \times 49 \div 7$$

$$-10 \times 49 \div 7$$

$$-490 \div 7$$

$$-70$$

$$\frac{8}{5-1} (3+6)^2 * 3$$

$$\frac{8}{4} (9)^2 * 3$$

$$2 (81) * 3$$

$$162 * 3$$

$$486$$