4.3 Order of Operations (REVIEW) - PEMDAS



"Operations" means things like add, subtract, multiply, divide, squaring, etc. If it isn't a number it is probably an operation.

But, when you see something like ... what do you do?

$$7 + (6 \times 5^2 + 3)$$



Warning: Calculate them in the wrong order, and you will get a wrong answer!

Order of Operations

Do things in Parentheses First. Example:

$$6 \times (5+3) = 6 \times 8 = \frac{4}{8}$$
 (wrong)
 $6 \times (5+3) = 30+3 = \frac{3}{3}$ (wrong)

Exponents (Powers, Roots) before Multiply, Divide, Add or Subtract. Example:

$$5 \times 2^2 = 5 \times 4 = 20$$

 $5 \times 2^2 = 10^2 = 100$ (wrong)

Multiply or Divide before you Add or Subtract. Example:

$$2 + 5 \times 3 = 2 + 15 = \frac{1}{7}$$
 $2 + 5 \times 3 = 7 \times 3 = 21$ (wrong)

Otherwise just go left to right. Example:

$$30 \div 5 \times 3 = 6 \times 3 = \frac{1}{8}$$
 $30 \div 5 \times 3 = 30 \div 15 = 2 \text{ (wrong)}$

How Do I Remember It All ... ? PEMDAS!



P Parentheses first

Exponents (ie Powers and Square Roots, etc.) Ë

Multiplication and Division (left-to-right) MD

Addition and Subtraction (left-to-right) AS

**Divide and Multiply equally (and go left to right)

**Add and Subtract equally (and go left to right)

Examples

Example: How do you work out 3 + 6 x 2?

Example: How do you work out $(3 + 6) \times 2$

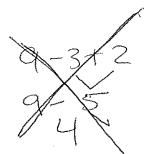


$$9-12 \div 4 + 2$$

$$9 - 3 + 2$$
 $6 + 2 = (8)$

$$150 + 3$$

$$1 \div 4 + 2$$



$$45 + 10(32 - 32) + 40$$

$$16 + 5 • 7 - 81 ÷ 9 + 30$$

$$16 + 5 \cdot 7 - 81 \div 9 + 30$$

 $16 + 35 - 81 \div 9 + 30$
 $16 + 35 - 9 + 30$