ORDER OF OPERATIONS

Order of Operations: order in which you calculate mathematical expressions

Absolute Value: distance a number is from zero

Absolute Value Examples:

1. $|-13| =$ 13

2. $|21| =$ 21

3. $|-3| + |-5| =$ 8

4. $|9| + |-8| =$ 17

5. $|-12| + |15| =$ 27

6. $|21 - 17| =$ 4

7. $|-11| - |-5| =$ 6

8. $|4| - |-4| =$ 0

9. $|15 - 23| =$ 8

10. $|24| - |-15| =$ 9

11. $|28| - |-26| =$ 2

12. $|-3| + |19| =$ 22

Order of Operations Examples:

13. $135 \div \left[5(7-4)^2\right]$

$135 \div [5(3)^2]$

$135 \div [5(9)]$

$135 \div 45$

3

14. $\dfrac{2 \cdot 4^2 - 8 \div 2}{(5+2) \cdot 2}$

$\dfrac{2 \cdot 16 - 4}{7 \cdot 2}$

$\dfrac{32-4}{14} = \dfrac{28}{14} = 2$

15. $(8-5)^3 - |5^2 - 4^3| \div 3$

$(3)^3 - |25 - 64| \div 3$

$27 - |-39| \div 3$

$27 - 39 \div 3$

$27 - 13 = 14$

16. $\dfrac{12\left[30 - (9+4^2)\right]}{|10| - |-6|}$

$\dfrac{12[30-(9+16)]}{10-6}$

$\dfrac{12[30-25]}{4} = \dfrac{12[5]}{4} = \dfrac{60}{4} = 15$

EVALUATING EXPRESSIONS

Substitution Property: If $a = b$, then a may be replaced for b in any expression.

Example: Evaluate $ab^2 + c$ **when a = 2, b = 4, and c = 7**

$2(4)^2+7$

$2 \cdot 16 + 7$

$32+7 = 39$

THE MOST IMPORTANT RULE IN ALGEBRA:

Put parenthesis around negative numbers when substituting them into an expression!

Example: Evaluate $3x^2 - 4x$ **when x = -2**

$3(-2)^2 - 4(-2)$

$3(4) - 4(-2)$

$12 + (+8) = 20$

More Examples:

1 $a^2b - b^2$ when a = 3 and b = -4

$3^2(-4) - (-4)^2$

$9(-4) - 16$

$-36 - 16 = -52$

2 $a^2b - b^2$ when a = 4 and b = -7

$4^2(-7) - (-7)^2$

$16(-7) - 49$

$-112 - 49 = -161$

3 $-y^2 - 3xy$ when x = -4 and y = 2

$-(2)^2 - 3(-4)(2)$

$-4 - (-24)$

$-4 + 24 = 20$

4 $-y^2 - 3xy$ when x = -5 and y = -3

$-(-3)^2 - 3(-5)(-3)$

$-9 - 45 = -54$