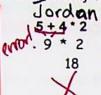Thurs 8/23

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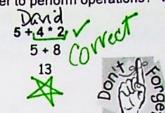**Objectives:** The students will be able to solve problems using order of operations.

Order of Operations

Jordan solved the problem 5 + 4 * 2 and got the answer of 18. David solved the same problem and got 13. Can both be correct? Is there only one correct order to perform operations? Who is correct?

Don't forget the different symbols for multiplication:

5*2   5(2)   5x2   5·2

Jordan
5 + 4 * 2
error . 9 * 2
18   ✗

David
5 + 4 * 2 ✓
5 + 8   Correct
13   ✗

Don't forget

① P (Level 1) — Grouping Symbols ( ) [ ] $\frac{x+y-z}{2c}$ fraction bar

② E (Level 2) — Exponents x^2 $\sqrt{25}$ y^3 $\sqrt[3]{64}$

③ D & M (Level 3) — Multiplication and Division (left to right)

④ S & A (Level 4) — Addition and Subtraction (left to right)

Practice   P   E   MD   AS

Steps must be shown so that each line of work is equal to the line above.

1. 5 * 10 - 6 * -2
$$50 + (+12)$$
$$50 + 12$$
$$\boxed{62}$$

2. 24 ÷ -6 * 2
$$-4 * 2$$
$$\boxed{-8}$$

3. -3 - 5(7 - 5)
$$-3 - 5(2)$$
$$-3 + -10$$
$$\boxed{-13}$$

4. 18 ÷ 5 * -3
$$18 + 15$$
$$\boxed{33}$$

5. $\dfrac{9 + 7 * 5}{4}$
$$\frac{9 + 35}{4} \quad \frac{44}{4}$$
$$\boxed{11}$$

6. 2 [9 (-6 + -4)] + 4
$$2 [9(-10)] + 4$$
$$2(-90) + 4$$
$$-180 + 4 \quad \boxed{-176}$$

7. 30 - 2^3
$$30 - 8$$
$$\boxed{22}$$

8. 3(8 + -14)²
$$3(-6)^2$$
$$3(36) \quad \boxed{108}$$

9. 25 - (2 + 2) * -3
$$25 + -4 * -3$$
$$25 + 12 \quad \boxed{37}$$

10. $\dfrac{8 - (7-1)^2}{-20 + 9 \cdot 2}$
$$\frac{8 + (-6)^2}{-20 + 18}$$
$$\frac{8 + 36}{-2} \quad \frac{44}{-2} \quad \boxed{-22}$$

11. -5[4³ - 2(-9 + 6)]

12. 9(-15 - 3 + 14)

Objectives: The students will be able to evaluate expressions and solve problems by evaluating expressions.

Evaluating Expressions

We have learned that, in an algebraic expression, letters can stand for numbers. When we substitute a specific value for each **variable**, and then perform the operations, it's called **evaluating** the expression.

Evaluating a variable expression

Example 1

Evaluate $18 + 2g$, for $g = 3$.

$18 + 2g$ Replace the variable

$18 + 2 \cdot 3$ Use the order of operations to solve.

$18 + 6$

24

Example 2

Evaluate $2ab - \dfrac{c}{3}$, for $a = 3$, $b = 4$, $c = 9$

$2ab - \dfrac{c}{3}$ Replace the variable

$2 \cdot 3 \cdot 4 - \dfrac{9}{3}$ Use the order of operations

$24 - 3$

21

Practice

Remember that a number beside a variable is multiplied. **2a means 2 * a**

Evaluate each expression.

1. $63 - 5x$, for $x = -7$ 2. $4(t + 3) + 1$, for $t = 8$ 3. $6(g + h)$, for $g = -18$ & $h = 7$

4. $2xy - z$, for $x = 4$, $y = 3$, and $z = -1$ 5. $\dfrac{r + s}{2}$, for $r = -13$ and $s = -11$

6. Becky saves $125 each year since her first birthday.

a. Write an expression for Becky's savings after 3 years. _____

b. Write an expression for Becky's savings after y years _____