

Chapter 2 Section 5
The Order of Operations Agreement
Part Two

Steps:

1. Do all operations inside parentheses.
2. Simplify any numerical expressions containing exponents.
3. Do multiplication and division as they occur from the left to right.
4. Do addition and subtraction as they occur from the left to right.

There is a mnemonic that helps students to remember the correct order of math operations that was described in section: PEMDAS(Please Excuse My Dear Aunt Sally).

$(-3)^2 = 9$ Step 1 and 2. You will square -3 . In another word you will multiply -3 twice:
 $(-3)*(-3) = 9$.

$-3^2 = -9$. Step 2 and 3. First you will square 3 and after you will multiply by negative 1:
 $3*3 = 9*(-1) = -9$.

$-3^2 = -9$ This is the same as $-(3)^2$.

Therefore $-3^2 \neq (-3)^2$.

Exercise

1. $8-4/(-2)$

Because there are no operation inside parentheses(step1) and neither exponent(step2), you will jump to the third step; Do the division.
Then do the subtraction

$$8-4/(-2) = 8-(-2) = 8+2 = 10.$$

2. $(-3)^2-2(8-3)+(-5)$

Perform operations inside the parentheses. (Step 1)

Simplify expression with exponents

Do the multiplication and division as they occur from left to right.

Do addition and subtraction as they occur from the left to right

$$\begin{aligned} (-3)^2-2(8-3)+(-5) &= (-3)^2-2(5)-5= \\ &= 9-2(5)-5 \\ &= 9-10-5 = -6. \end{aligned}$$

You can use the order of operations agreement rule in evaluation variable problems:

EX: Evaluate $ab-b^2$ when $a=2$ and $b=6$

Replace 2 and 6 in according to the letter stated above.

Using the order of operations agreement, you simplify the resulting numerical expression. Also, simplify the exponential expression.

Do the multiplication and the subtraction.

$$\begin{aligned}\text{Solving: } 2 \cdot 6 - (-6)^2 \\ -12 - 36 = -48\end{aligned}$$

More Examples:

1. Simplify $12/(-2)^2 - 5$

$$\begin{aligned}12/(-2)^2 - 5 &= 12/4 - 5 \\ &= 3 - 5 \\ &= -2.\end{aligned}$$

2. Simplify $(-3)^2(5-7)^2 - (-9)/3$

$$\begin{aligned}(-3)^2(5-7)^2 - (-9)/3 &= 9 \cdot (-2)^2 - (-9)/3 \\ &= 36 - (-3) \\ &= 39.\end{aligned}$$