Evaluating Negative Numbers with a Power

A common mistake that is made with a negative number that has a power is when parentheses are left off when needed or added incorrectly.

Example 1:

$$-4^2 \qquad vs \qquad (-4)^2$$

These terms sound the same when read aloud but they mean very different things.

-4^2 **Meaning: The negative sign in front stands for -1, so this means -1 times 4 squared.**

$$-4^2 = -1(4)^2 = -1\,(16) = -16$$

$(-4)^2$ **Meaning: Negative 4 squared, means - 4 times - 4.**

$$(-4)^2 = (-4)\,(-4) = 16$$

When substituting a number for a variable ALWAYS place parentheses around the number because it can change the result of the answer as demonstrated in Example 1.

Example 2:

$y^2 + 2y$ *when* $y = -3$

$-3^2 + 2 - 3$ $(-3)^2 + 2(-3)$

Incorrect without parentheses *Correct with parentheses*

Example 3:

$-x^2 - 5x$ *when* $x = 4$

$(-4)^2 - 5(4)$ $-(4)^2 - 5(4)$

Incorrect use of parentheses *Correct use of parentheses*

Example 4:

$3x^2 - 4x$ *when* $x = -2$

$3(-2)^2 - 4(-2)$ *Substitute (-2) in for each x*

$3(4) + 8$ *Square the (-2) to get (4) and multiply -4(-2) to get 8*

$12 + 8$ *Add the 12 and 8*

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