Online Math Center

Inequalities: Comparing Values

We use inequalities to compare the relative size of things. With an inequality we can state that one item is either larger (greater) than another item, or that something is smaller (less) than something else..

For example,

Twenty-five dollars is more than three dollars. We write: $25 > $3

A cholesterol reading of 155 is less than a reading of 215. Hence, chorl 155 < chorl 215

The symbols associated with inequalities are:

Less than	$<$	21 is less than 8	$21 < 8$
Less than or equal	$\leq$	Pollution levels are less than or equal to 76 units	P levels $\leq$ 76 units
Greater than	$>$	3^3-4 is greater than 13	$3^3-4 > 13$
Greater than or equal	$\geq$	The population of the world in 2020 may be greater than or equal to 3 billion people	World Pop $\geq$ 3 billion

Order of Operations and Inequalities

There may be times when we want to compare two mathematical expressions.

For example,

True or False: $4^2-5(5)+4(5^2)$ is larger than or possibly equal to (9-4)(5+3(5)) ?

Solution:
Form an inequality, simplify, and determine if the answer is true or false.
Help: Order of Operations.

$4^2-5(5)+4(5^2) \geq ?\ (9-4)(5+3(5))$
$4^2-5(5)+4(25) \geq ?\ (5)(5+15)$
$16-5(5)+4(25) \geq ?\ (5)(20)$
$16-25+100 \geq ?\ 100$
$16-25+100 \geq ?\ 100$

$-9 + 100 \geq ? \; 100$
$91 \geq ? \; 100$

Since 91 is neither greater than nor equal to 100, the statement is FALSE.

Order of Operations, Absolute Values and Inequalities

Comparing Values using Absolute Values and Inequalities

True or False: $| 3^2 - 6(3) |$ is less than $23 + | -5 - 7 |$?

Solution:
Form an inequality, simplify, and determine if the result is true or false.
Help: Order of Operations, Absolute Values

$| 3^2 - 6(3) | < ? \; 23 + | -5 - 7 |$
$| 9 - 6(3) | < ? \; 23 + | -5 - 7 |$
$| 9 - 18 | < ? \; 23 + | -12 |$
$| -9 | < ? \; 23 + | -12 |$
$9 < ? \; 23 + 12$
$9 < ? \; 35$

The last statement is true, nine is less than thirty-five. The answer is TRUE.