

## Section 6.2 Solving Multi-Step Linear Inequalities

Solving multi-step inequalities are exactly like solving equations except for reversing the inequality sign when multiplying or dividing by a negative number. There are a few examples show below.

**Example 1:**  $3x + 7 = 28$       subtract 7 from both sides  
 $3x = 21$       divide both sides by 3  
 $x = 7$

**Example 2:**  $10 - 2x = 18$       subtract 10 from both sides  
 $-2x = 8$       divide by  $-2$  and reverse the inequality  
 $x = 4$

**Example 3:** You want to make more than \$3000 for your surf camp by mowing lawns. Each time you mow the big lawns, you get \$25. You have to get a mower for \$300 and each lawn costs you \$2 in mower operation costs. Write an inequality to express the situation. Let  $x$  = number of lawns mowed. Solve for the inequality.

Verbal Model: 

dollars per lawn
------------------

 \* 

number of lawns
-----------------

 - 

expense per lawn
------------------

 \* 

number of lawns
-----------------

 - 

cost of mower
---------------

 = 

profit
--------

Labels:      25      \*      x      -      2      \*      x      -      300      =      3000

Equation:  $25x - 2x - 300 = 3000$       combine like terms  
 $23x - 300 = 3000$

Solve:  $23x - 300 = 3000$       combine like terms  
 $23x = 3300$   
 $x = 3300/23$   
 $x = 143.77$

Since you cannot get paid for a partial lawn you need to round up to the next full lawn. You would have to mow 144 big lawns to make the profit you need.