Solving Linear Inequalities

Here's an example of a **linear inequality in one variable**: $3x - 2 \leq 1$

Is 0 a solution?

Is 1 a solution?

Is 2 a solution?

The solution set in interval notation is: _____

Ex 1.
Solve and graph the solution set of $2x + 3 < -5$.

Note: Solving inequalities is similar to solving equations, with one *important* difference:
If _____ both sides by a _____, then _____ inequality symbol.
Why? Here's an example:

$$1 < 2$$
$$(-1) \cdot 1 > (-1) \cdot 2$$
$$-1 > -2$$

Ex 2.
Solve and graph the solution set of $-3x + 4 \leq 10$.

Ex 3.

Solve and graph the solution set of:

$$\frac{x+2}{3} \geq \frac{x-1}{4} + \frac{1}{3}$$

Ex 4.

Solve $3(x+3) > 3x + 8$. What happens and what does it mean?

Ex 5.

Solve $x + 2 \leq x - 4$. What happens and what does it mean?

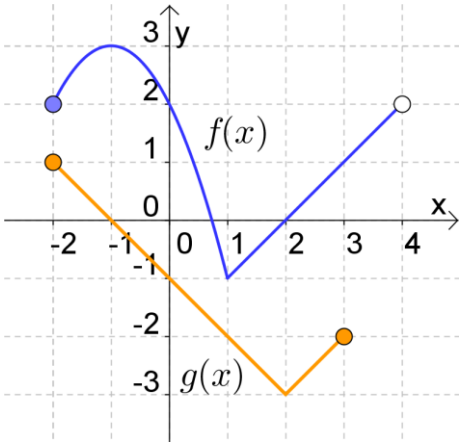
So, when solving an inequality…

…if get a _____ statement (like $0 > 1$), then solution set is _____ (i.e. _____).

…if get a _____ statement (like $3 > 2$), then solution set is _____ (i.e. _____).

Practice

1. Solve and graph the solution set of the following inequality. Express the solution set using interval notation.
   $-\frac{5x}{10} + 1 \geq \frac{1}{5} - \frac{x}{10}$
2. Solve $3(x-2) + x \leq 4(x-1)$. Express the solution set using interval notation.
3. Solve $5x < 5(x-3)$.
4. (Review) Solve $A = P + Prt$ for P.
5. (Review) Use the following graph to answer the following questions.



a) Find $f(1)$. b) Find $g(1)$. c) Find $\left(\frac{f}{g}\right)(1)$. d) Find $(fg)(0)$.

6. (Review) Simplify: $\left(\frac{-15a^4b^2}{5a^{10}b^{-3}}\right)^3$

Q: What has teeth but can't bite?