MATH 156: Precalculus
Fall 2015
Worksheet §1.8: Inequalities

We will walk through FOUR types of inequalities. They all have slightly different methods of solution. Before each type you will identify the crucial properties to remember.
For all of the problems below, you must (1) solve the inequality, (2) express the solution as an interval, and (3) graph the solution set.

1. Linear Inequalities

   (a) What algebraic operation(s) will cause an inequality to "flip" direction?

   (b) $10 \geq -2x$

   (c) $\frac{5}{3} - \frac{1}{3}x < -\frac{1}{3} + x$

   (d) $-3 \leq 3x + 7 < 1$

2. Nonllinear Inequalities

(a) What is the strategy for solving nonlinear inequalities?

(b) $x(x+5)(x-3) > 0$

(c) $2x^2 + x \geq x^2 + 10x + 10$

(d) $x^3(x-2)^2 < 0$

3. Inequalities Involving Quotients

   (a) What is the strategy for solving quotients?

   (b) $\frac{2x-1}{3+x} \geq 0$

   (c) $\frac{x}{2} \geq \frac{7}{x+1} + 4$

4. Absolute Value Inequalities

   (a) What is the solution to $|x| > a$?

   (b) What is the solution to $|x| < a$?

(c) $|7x| \geq 14$

(d) $|5x - 2| < 8$

(e) What is the domain of $\sqrt{4 - x^2}$?