Chapter 1
Section 1.7

Compound Inequalities

(1) Solve $\frac{1}{2}(x+6) > 3$ or $4(x-1) < 3x-4$.

(2) The price of a Full Salad at your favorite restaurant is 10 cents more than the hamburger. You are out with a group of people out to celebrate and the bill comes out with 10 hamburgers and 5 salads. If the bill was more than \$37.94 and less than \$46.04, including tax at 8% and a \$5.00 tip, then in what price range is a hamburger?

Absolute Value Inequalities
Absolute value inequalities are just a special type of compound inequalities. Most often they are used to calculate error.

Def: If L is the measurement you are trying to get and x is the measurement that you actually get then the **absolute error** or your measurement is $|x-L|$. The **relative error** of your measurement is $|x-L|/L$, that is, the error of your measurement relative to (as a percentage of) the desired measurement.

(3) Write the following absolute value equations as compound inequalities with "and" or "or" in them as exercise (1) above is written.

(a) $|x| \leq k$

(b) $|x| > k$

Q: Explain why one of the above is written with an "and" and the other is with an "or".

(4) A technician is testing a scale with a 50-lb block of steel. The scale passes the test if the relative error when weighing the block is less than 0.1%. If x is the reading on the scale, then for what value of x does the scale pass the test?

(5) Michelle is trying to keep the water temperature in her chemistry experiment at 35°C. For the experiment to work, the relative error for the actual temperature must be less than .8%. Write an absolute value inequality for the actual temperature. Find the interval in which the actual temperature must lie.