Solving Rational Inequalities

Name: _____

Solve the following rational inequalities.

1) $\frac{9}{x-4} \geq -6$

2) $\frac{7}{x+5} < \frac{8}{x+6}$

3) $\frac{1}{x-2} + \frac{1}{x^2-7x+10} > \frac{6}{x-2}$

4) When successful new software is first introduced, the weekly sales generally increase rapidly for a period of time and then begin to decrease. Suppose that the weekly sales S (in thousands of units) t weeks after the software is introduced are given by the equation: $S = \frac{200t}{t^2+100}$. When will sales be 8 thousand units per week or more?

5) A drug is injected into the bloodstream of a patient through her right arm. The concentration (in milligrams per milliliter) of the drug in the bloodstream of the left arm t hours after the injection is given approximately by the equation: $C = \frac{0.12t}{t^2+2}$. When will the concentration of the drug in the left arm be 0.04 mg/ml or greater?

6) The number of coyotes living on a ranch in west Texas is modeled by the equation: $P(t) = \frac{235t}{t+15}$ where t = 0 is the year 1850. Approximately what year does the population of coyotes reach 170? For what years is the coyote population less than 200? What is the horizontal asymptote of P(t), and what does it mean within the context of the problem?