Math 163A **Guide for Test 1**

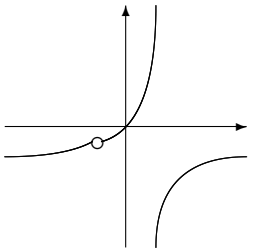
Here are some sample questions from old tests. Some topics that we covered are not represented by these questions, but are still fair game.

1. (a) Find the equation for the line that passes through the point $(-1, 0)$ and the point $(1, 4)$.
   (b) Find the equation for the line that passes through the point $(2, -4)$ and has slope -2.
   (c) Find the point where these two lines intersect. (Solve for it; no credit for guessing.)
   (d) Graph both lines.

2. Consider the parabolic function $f(x) = x^2 - 10x + 21$.
   (a) Find its x-intercepts (if it has any).
   (b) Find its axis and vertex.
   (c) Graph it.

3. It costs you \$7 to buy a gizmo that makes widgets, and then \$2 to make each widget. Widgets sell for \$4. How many do you need to sell to make a profit of \$53, so that you can buy a new toy?

4. Consider the function $f(x) = \dfrac{x^2 + x}{1 - x^2}$. Its graph looks roughly like:



   (a) Find its domain and range.
   (b) Find its asymptotes (if it has any).
   (c) Sketch a graph of $-f(x + 1)$.