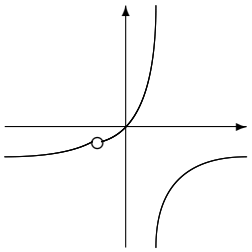
Math 266A **Winter 2009** **Guide for Test 1**

The first test is in class on Friday 16 January.

Here are some sample questions, so that you have an idea of what to expect. The homework problems are also a good source of practice material.

1. (a) Find the equation for the line that passes through the point $(1, -1)$ and the point $(2, 1)$.
   (b) Find the two points where this line intersects the parabola $y = x^2 + 2x - 4$. (Solve for them; no credit for guessing.)
   (c) Graph the line and the parabola.

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



   (a) Find its domain and range.
   (b) Sketch a graph of $-f(x + 1)$.

3. Let $f(x) = \sin(x)$ and $g(x) = |3x|$.
   (a) Evaluate $(f \circ g)(-\pi/3)$.
   (b) Evaluate $(g \circ f)(-\pi/2)$.
   (c) Sketch the graph of $g(x)f(x)$.

4. Consider the relationship $s = 10 \cdot 100^t$.
   (a) Use a logarithmic transformation to uncover a linear relationship.
   (b) Plot the (linear) relationship between the transformed quantities, labeling the axes and two points on the line.

5. You accidentally eat 10,000 salmonella bacteria on some undercooked chicken. In two hours the population has grown to 100,000. Assuming exponential growth, how many salmonella will be living in your intestine five hours after you ate the chicken?