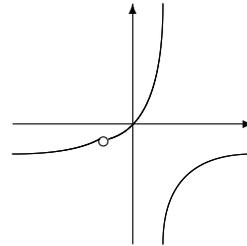


Math 163A**Guide for Test 1**

Here are some sample questions from Sections 1.1, 1.2, 2.1–3, 3.1, and 3.2. Some topics that we covered are not represented by these questions, but are still fair game.

- Find the equation for the line that passes through the point $(-1, 0)$ and the point $(1, 4)$.
 - Find the equation for the line that passes through the point $(2, -4)$ and has slope -2 .
 - Find the point where these two lines intersect. (Solve for it; no credit for guessing.)
 - Graph both lines.
- Consider the parabolic function $f(x) = x^2 - 10x + 21$.
 - Find its x -intercepts (if it has any).
 - Find its axis and vertex.
 - Graph it.
- 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 $f(x) = \frac{x^2 + x}{1 - x^2}$. Its graph looks roughly like:



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

5. Compute the following limits:

- $\lim_{x \rightarrow 2} \frac{x - 2}{x^2 - 5x + 6}$
- $\lim_{h \rightarrow 0} \frac{x^2 - (x - 2h)^2}{h}$
- $\lim_{x \rightarrow 1} \frac{\sqrt{x} - 1}{x - 1}$
- $\lim_{x \rightarrow -\infty} \frac{3x^3 - 4}{2x^3 - 2}$

6. Consider the function

$$f(x) = \begin{cases} x^2 & \text{if } x \leq -2 \\ Ax & \text{if } x > -2 \end{cases},$$

where A is some constant.

- Find $\lim_{x \rightarrow -2^-} f(x)$. Is f continuous from the left at $x = -2$?
- What value of A would make f continuous at $x = -2$?
- Using the value of A that you just found, graph f .