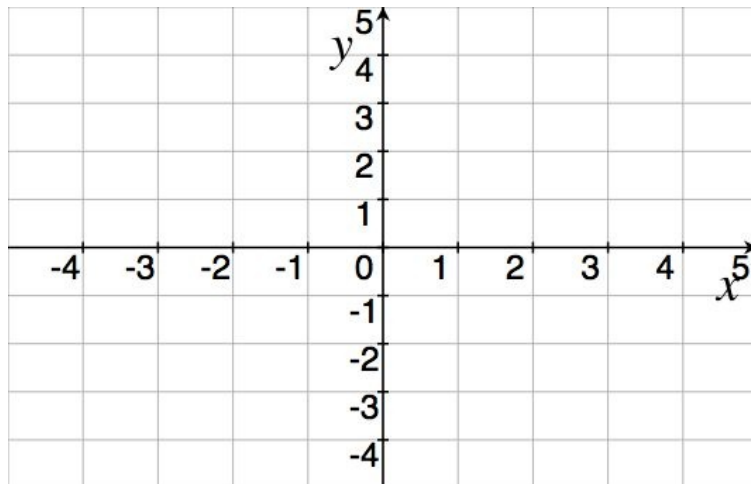# TMATH 124: Quiz 1

Show *all* your work (numerically, algebraically, or geometrically) for each and simplify. No credit is given without supporting work.

1. (§2.2 #12) Let $f(x) = \begin{cases} 3^x & \text{if } x < 1 \\ \sin(\pi x) & \text{if } 1 \le x \end{cases}$

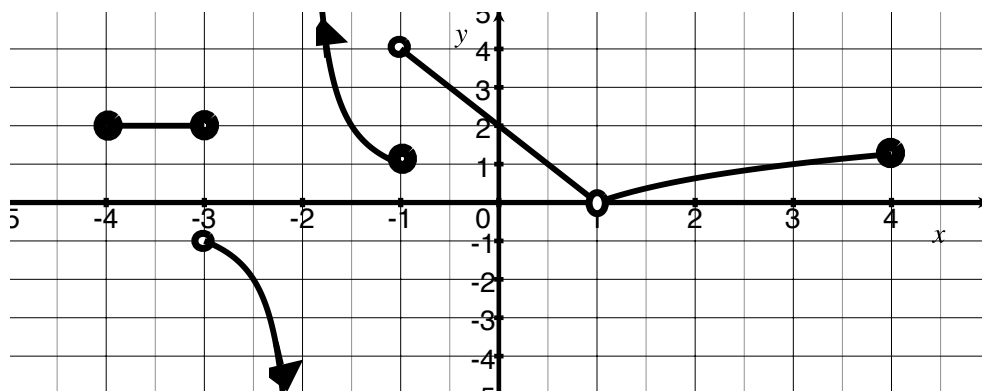   (a) [2] *Carefully* graph f on the axis provided

   (b) [1]Determine the values of c for which $\lim_{x \to c} f(x)$ exists.

2. [2] (WebHW3 #8) Find:

$$\lim_{t \to 0} \left(\frac{9}{t} - \frac{9}{t^2 + t} \right)$$

3. [2] (limit laws wks #2) For the function f whose graph is given, estimate the value of each quantity, if it exists.

$f(-1)$ $\lim\limits_{x \to 1} f(x)$ $\lim\limits_{x \to -3+} f(x)$

4. [3] (Limit Wks #3) Sketch a graph of a function α that satisfies *all* of the following:

(a) $\lim\limits_{x \to -1} \alpha(x) = 3$

(b) $\lim\limits_{x \to 2+} \alpha(x) = \infty$