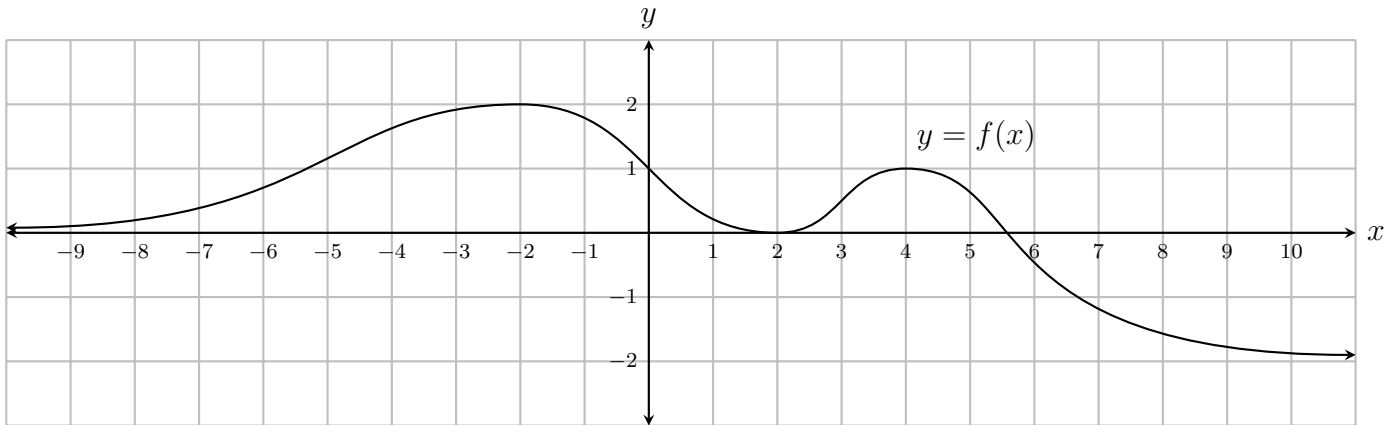Name: _____

Directions: Closed book, closed notes, no calculators.   Each problem is 10 points, for a total of 20 points.

By submitting this quiz you affirm that you agree with this statement: *On my honor, I have neither given nor received unauthorized aid on this assignment, and I pledge that I am in compliance with the VCU Honor System.*

1. Answer the following questions involving the function $f(x)$ graphed below.

(a) $\lim\limits_{x \to \infty} f(x) = \boxed{-2}$

(b) $\lim\limits_{x \to -\infty} f\left(\dfrac{1}{x}\right) = f\left(\lim\limits_{x \to -\infty} \dfrac{1}{x}\right)$

$\qquad\qquad = f(0) = \boxed{1}$

(c) $\lim\limits_{x \to -\infty} e^{f(x)} = e^{\lim\limits_{x \to -\infty} f(x)} = e^0 = \boxed{1}$

(d) $\lim\limits_{x \to -\infty} \dfrac{1}{f(x)} = \boxed{\infty}$

(Because $f(x)$ is positive, approaching 0.)

(e) $\lim\limits_{x \to 4} \dfrac{x}{1 - f(x)} = \boxed{\infty}$

(Because top approaches 4, bottom is positive, approaching 0.)

2. Sketch the graph of **one** function f, continuous on $(-\infty, 1) \cup (1, \infty)$, meeting **all** of these criteria:

(a) $f(-2) = 1$

(b) $\lim\limits_{x \to -\infty} f(x) = 0$

(c) $\lim\limits_{x \to \infty} f(x) = 1$

(d) $\lim\limits_{x \to 1^-} f(x) = -\infty$

(e) $\lim\limits_{x \to 1^+} f(x) = \infty$