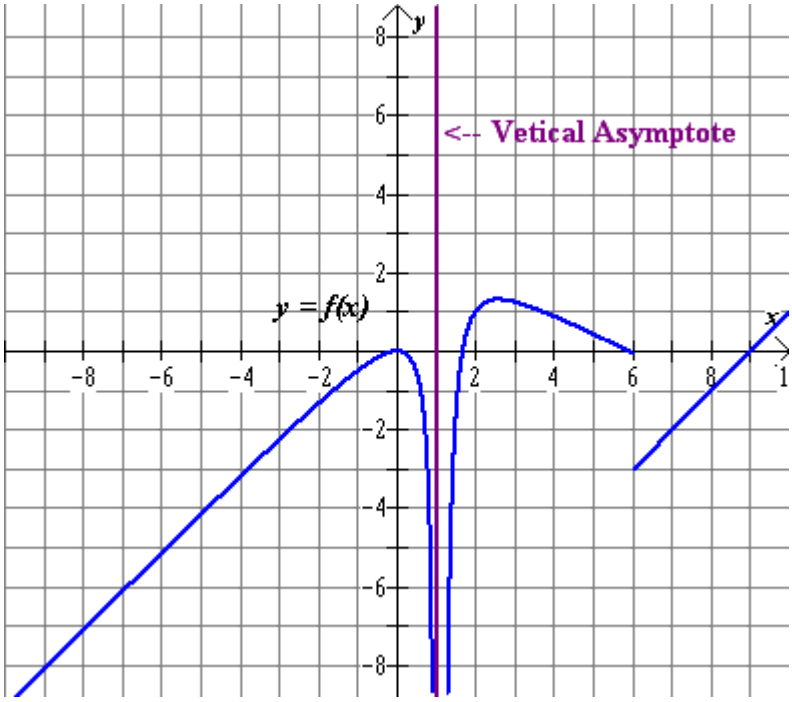
Exam 1 Calculus I 804-231 Spring 2009 /100

Name _____

1. (32 points) Below is a plot of the function $f(x)$.



Determine the following:

a) The values where $f(x)$ is discontinuous.

b) $\lim_{x \to 1} f(x)$ = _____

c) $\lim_{x \to 6^-} f(x)$ = _____

d) $\lim_{x \to 6^+} f(x)$ = _____

e) $\lim_{x \to 8} xf(x)$ = _____

f) $\lim_{x \to 2} x^2 f(x)$ = _____

g) $\lim_{x \to 1} \frac{x}{f(x)}$ = _____

2. (36 points) Evaluate the following limits:

a) $\lim_{x \to 2} \frac{x^2-4}{x+2}$ = _____

b) $\lim_{x \to -2} \frac{x^2-4}{x+2}$ = _____

c) $\lim_{t \to 0^+} \frac{t^2-t+5}{t}$ = _____

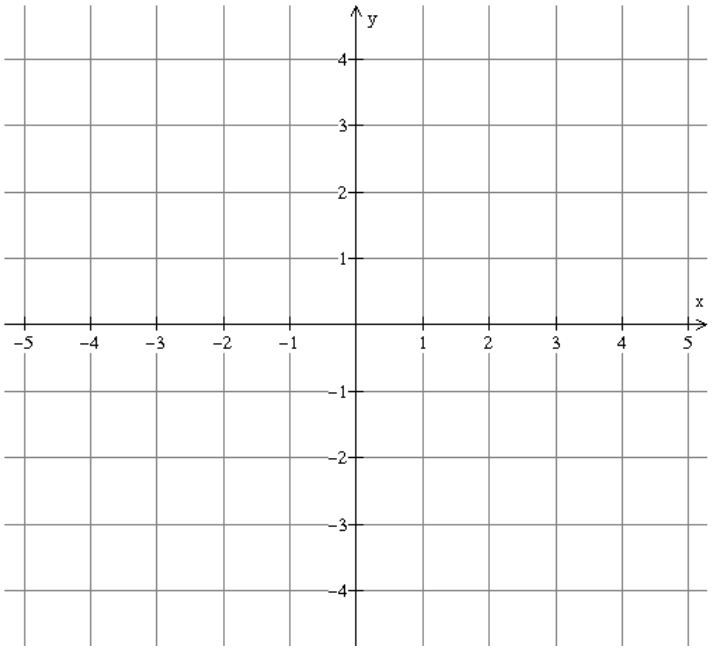
d) $\lim_{x \to \infty} \frac{\sin(\alpha x)}{x}$ = _____

f) $\lim_{x \to 4} \frac{\sqrt{x+5}-3}{x-4}$ = _____

g) $\lim_{x \to \infty} \sqrt{\frac{25x^5+11x^4-2x^3+6x^2+3x-19}{4x^5+6x^3-36x}}$ = _____

3. (32 points) For this problem use the piece wise defined function $f(x) = \begin{cases} x^2 & \text{for } |x| \leq 1 \\ x & \text{for } |x| > 1 \end{cases}$.

a) Graph $f(x)$ **and** state where in its domain the function is *c*ontinuous.

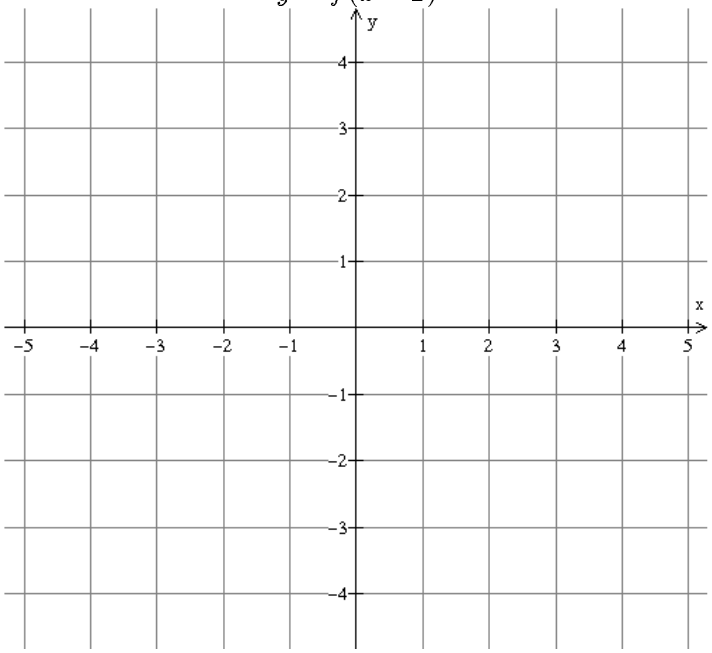


b) Evaluate the following:

$\lim_{x \to -1^-} f(x) =$ _____ $\lim_{x \to -1} (x+1)f(x) =$ _____

c) Sketch the following :

$y = f(x-2)$



$y = f(-x)$