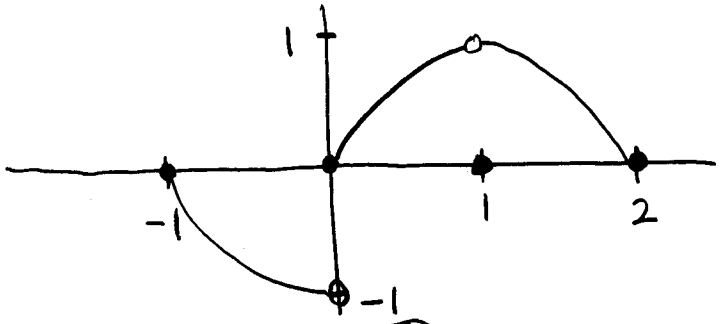
MATH 113 – QUIZ 1 – 29 JANUARY 2007

Answer all of the following questions in the space provided. Show all work as partial credit may be given. Answers without justification, even if they are correct, will earn no credit.

1. (1 pt. each) Consider the function $f(x)$ whose graph is sketched below. Determine whether each of the following statements is true or false (CIRCLE ONE).



(a) $\lim_{x\to 1} f(x)$ does not exist. T (F)

(b) $\lim_{x\to 1} f(x) = f(1)$. T (F)

(c) $\lim_{x\to 1} f(x) = 1$. (T) F

(d) $\lim_{x\to 0} f(x)$ does not exist. (T) F

2. (2 pts. each) Evaluate each of the following limits.

(a) $\lim_{x\to 4} \frac{2x}{x^2-1} = \frac{2(4)}{(4)^2-1} = \frac{8}{15}$ //

(b) $\lim_{y\to 0} \frac{4y+y^2}{3y-y^2} = \lim_{y\to 0} \frac{4+y}{3-y} = \frac{4}{3}$ //

Simplify

$\frac{4y+y^2}{3y-y^2} = \frac{y(4+y)}{y(3-y)} = \frac{4+y}{3-y}$ if $y \neq 0$

(c) $\lim_{x\to 1} \frac{\sqrt{x+3}-2}{x-1} = \lim_{x\to 1} \frac{1}{\sqrt{x+3}+2} = \frac{1}{4}$ //

Simplify

$\frac{\sqrt{x+3}-2}{x-1} \cdot \frac{\sqrt{x+3}+2}{\sqrt{x+3}+2} = \frac{x+3-4}{(x-1)(\sqrt{x+3}+2)} = \frac{(x-1)}{(x-1)(\sqrt{x+3}+2)}$

$= \frac{1}{\sqrt{x+3}+2}$ if $x \neq 1$