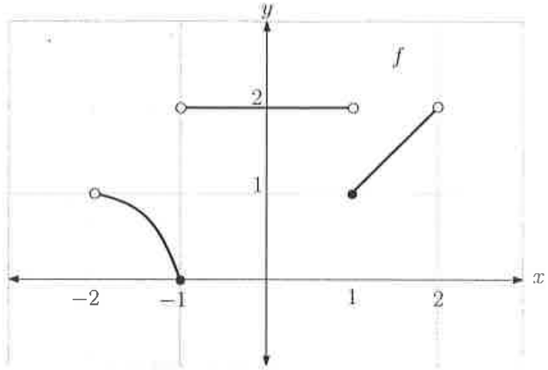
Score: ______ out of 10.

Math 201 - Quiz #2 Name: ____________________

1. Use the graph of the given function $y = f(x)$ below to compute the following limits (if they exist):



(a) $\lim_{x\to -1^-} f(x) = \boxed{0}$

(b) $\lim_{x\to -1^+} f(x) = \boxed{2}$

(c) $\lim_{x\to -1} f(x) = \boxed{\text{D.N.E.}}$

(d) $\lim_{x\to 1^-} f(x) = \boxed{2}$

(e) $\lim_{x\to 1^+} f(x) = \boxed{1}$

(f) $\lim_{x\to 1} f(x) = \boxed{\text{D.N.E}}$

2. (a) $\lim_{x\to -3^-} \dfrac{x+2}{x+3} = \boxed{+\infty}$

goes to −1 (and is −)

goes to 0 (and is −)

x<−3

(b) Part (a) shows that the function $f(x) = \dfrac{x+2}{x+3}$ has a vertical asymptote at $x = \boxed{-3}$

3. **Pick ONE of the following (please circle which one you will solve).** Otherwise, I will grade the first one you work on. You must show work on this problem.

(a) $\lim_{x\to 2} \dfrac{x^2-4}{x^2+x-6}$

(b) $\lim_{x\to 7} \dfrac{\sqrt{x+2}-3}{x-7}$

(c) $\lim_{x\to -4} \dfrac{\frac{1}{4}+\frac{1}{x}}{4+x}$

See next page for solutions

Please put your final answer in this box $\longrightarrow$ $\boxed{}$

(a) $\lim_{x \to 2} \frac{x^2-4}{x^2+x-6} = \lim_{x \to 2} \frac{\cancel{(x-2)}(x+2)}{\cancel{(x-2)}(x+3)}$

$= \lim_{x \to 2} \frac{x+2}{x+3}$

$= \frac{2+2}{2+3} = \boxed{\frac{4}{5}}$

(b) $\lim_{x \to 7} \left(\frac{\sqrt{x+2}-3}{x-7}\right)\left(\frac{\sqrt{x+2}+3}{\sqrt{x+2}+3}\right)$

$= \lim_{x \to 7} \frac{(\sqrt{x+2})^2 - \cancel{3\sqrt{x+2}} + \cancel{3\sqrt{x+2}} - 9}{(x-7)(\sqrt{x+2}+3)}$

$= \lim_{x \to 7} \frac{x+2-9}{(x-7)(\sqrt{x+2}+3)}$

$= \lim_{x \to 7} \frac{\cancel{(x-7)}}{\cancel{(x-7)}(\sqrt{x+2}+3)} = \lim_{x \to 7} \frac{1}{\sqrt{x+2}+3}$

$= \frac{1}{\sqrt{9}+3} = \frac{1}{3+3} = \boxed{\frac{1}{6}}$

(c) $\lim_{x \to -4} \frac{\frac{1}{4}+\frac{1}{x}}{4+x} = \lim_{x \to -4} \frac{\frac{x+4}{4x}}{\frac{4+x}{1}} = \lim_{x \to -4} \left(\frac{\cancel{x+4}}{4x}\right)\left(\frac{1}{\cancel{4+x}}\right)$

$= \lim_{x \to -4} \frac{1}{4x} = \boxed{\frac{-1}{16}}$