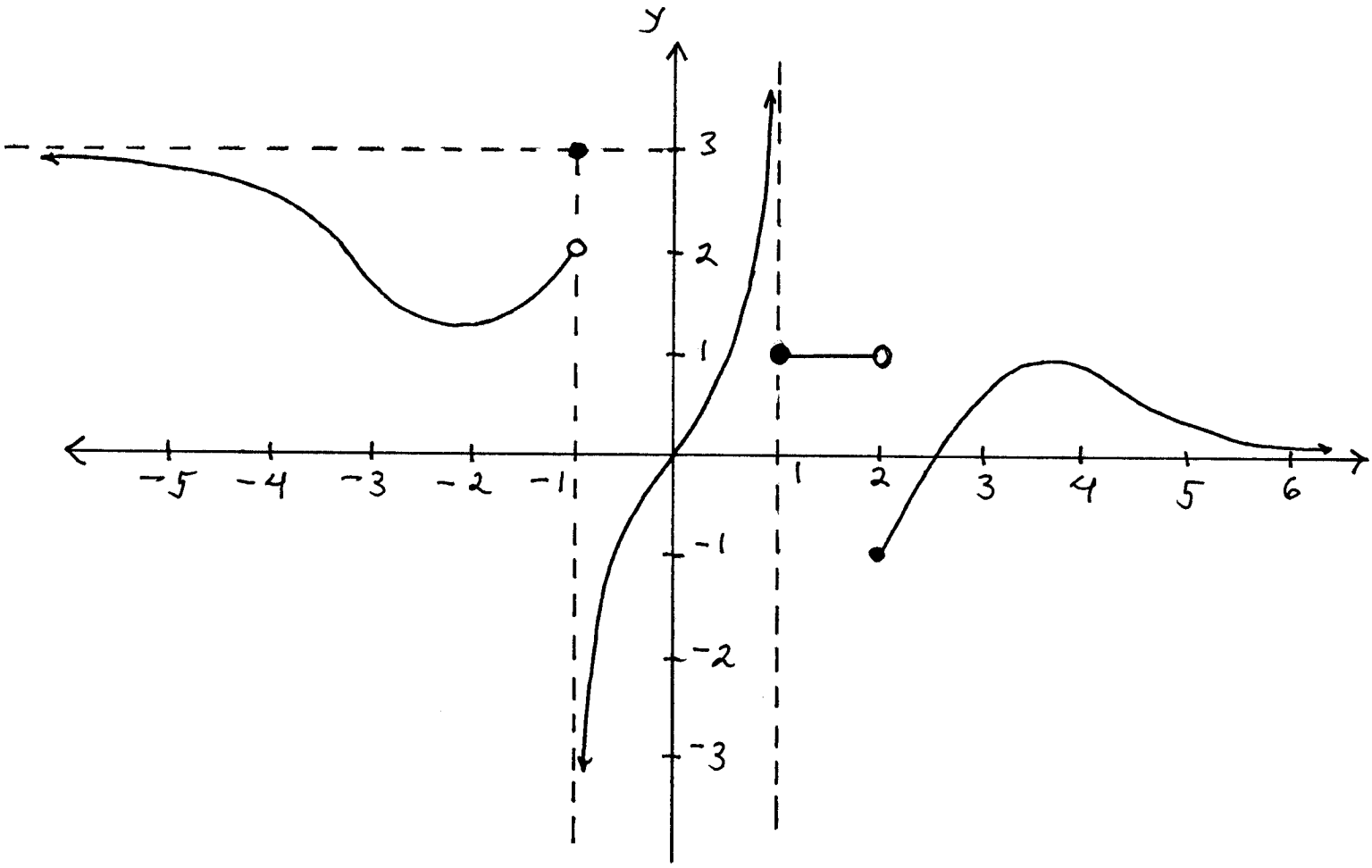
Math 16A (Summer 2008)
Kouba
Quiz 2

PRINT Name : _____

Exam ID # : _____

1.) (2 pts. each) Use the given graph to determine the following limits



a.) $\lim_{x \to 0} f(x) = 0$

b.) $\lim_{x \to 3} f(x) = \frac{1}{2}$

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

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

e.) $\lim_{x \to 2} f(x)$ DNE

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

g.) $\lim_{x \to -1^+} f(x) = -\infty$

h.) $\lim_{x \to -1^-} f(x) = 2$

i.) $\lim_{x \to \infty} f(x) = 0$

j.) $\lim_{x \to -\infty} f(x) = 3$

2.) (5 pts. each) Determine the following limits.

a.) $\lim_{x\to 3} \frac{x^2-9}{x^2+x-12} \overset{\text{"}\frac{0}{0}\text{"}}{=} \lim_{x\to 3} \frac{(x-3)(x+3)}{(x-3)(x+4)} = \frac{6}{7}$

b.) $\lim_{x\to 1} \frac{x-1}{\sqrt{x}-1} \overset{\text{"}\frac{0}{0}\text{"}}{=} \lim_{x\to 1} \frac{x-1}{\sqrt{x}-1} \cdot \frac{\sqrt{x}+1}{\sqrt{x}+1}$

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

c.) $\lim_{x\to\infty} \frac{x^3-x^2+10}{3x^2+7} \overset{\text{"}\frac{\infty}{\infty}\text{"}}{=} \lim_{x\to\infty} \frac{x^3-x^2+10}{3x^2+7} \cdot \frac{\frac{1}{x^2}}{\frac{1}{x^2}}$

$= \lim_{x\to\infty} \frac{x-1+\frac{10}{x^2}}{3+\frac{7}{x^2}} = \frac{\infty-1+0}{3+0} = \infty$

3.) Consider the function $y = \dfrac{3x-6}{x-1}$.

a.) (4 pts.) Find the x- and y-intercepts for the function.

$x=0$: $\boxed{y=6}$

$y=0$: $\dfrac{3x-6}{x-1} = 0 \rightarrow 3x-6=0 \rightarrow$

$3(x-2)=0 \rightarrow \boxed{x=2}$

b.) (4 pts.) Use limits to find equations for all vertical asymptotes.

$\lim\limits_{x\to 1^+} \dfrac{3x-6}{x-1} = \dfrac{"-3"}{0^+} = -\infty$, V.A. : $\boxed{x=1}$

$\lim\limits_{x\to 1^-} \dfrac{3x-6}{x-1} = \dfrac{"-3"}{0^-} = +\infty$

c.) (4 pts.) Use limits to find equations for all horizontal asymptotes.

$\lim\limits_{x\to\pm\infty} \dfrac{3x-6}{x-1} \cdot \dfrac{\frac{1}{x}}{\frac{1}{x}} \overset{"\frac{\infty}{\infty}"}{=} \lim\limits_{x\to\pm\infty} \dfrac{3-\frac{6}{x}}{1-\frac{1}{x}}$

$= \dfrac{3-0}{1-0} = 3$, H.A. : $\boxed{y=3}$

d.) (3 pts.) Use results from a., b., and c. to sketch the graph of the function. Label your graph appropriately.