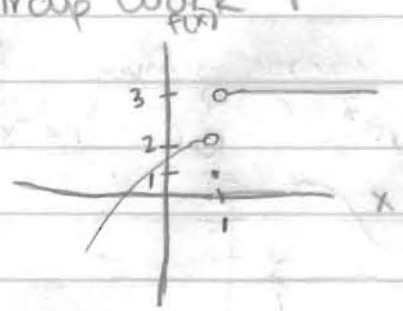
1-25-12

Group Work 1

1.



Hint:
- look at x values close to (but not equal to) a
- what are the y-values correspond to the these x-values getting closer to ?

a) $f(1) = 1$

b) $\lim_{x \to 1^-} f(x) = 2$ (right-hand limit) from the right

c) $\lim_{x \to 1^+} f(x) = 3$ (left-hand limit) from the left

d) no, the right hand limit ≠ left hand limit

* these need to be equal for the limit to exist

2. $\lim_{x \to 0} \frac{\sin x}{x} = 1$ (use calculator)

Group Work 2

1. $f(x) = \frac{(x-3)}{(x^2-9)}$

Q. what is the asymptote of $f(x) = \frac{(x-3)}{(x^2-9)}$

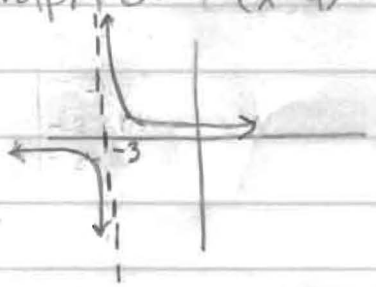
$f(x) = \frac{(x-3)}{(x-3)(x+3)}$ ← factor out $(x-3)$

$f(x) = \frac{1}{(x+3)}$ $x = -3$ is an asymptote

$(x+3) = 0$

$x = -3$

2. Graph of $\frac{x-3}{(x^2-9)}$



Q. Prove that $x = -3$ is an asymptote

$\lim_{x \to -3^+} = \infty$

$\lim_{x \to -3^-} = -\infty$

* also use a calculator to look at values of x as it approaches -3 from the left and right side.