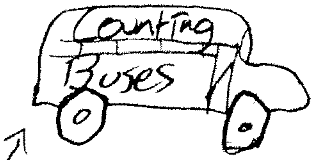
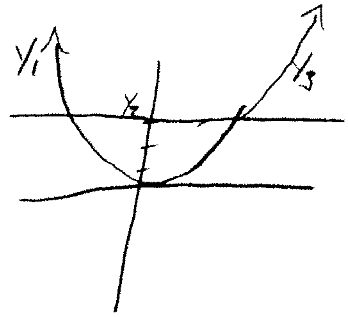
1.4 - 4/4

Determine whether $f(x)$ is continuous from the right at $x=2$



HW #5

$$f(x)=\begin{cases} x^2 & \text{if } x<2 \\ 3 & \text{if } x=2 \\ 3x-3 & \text{if } x>2 \end{cases}$$

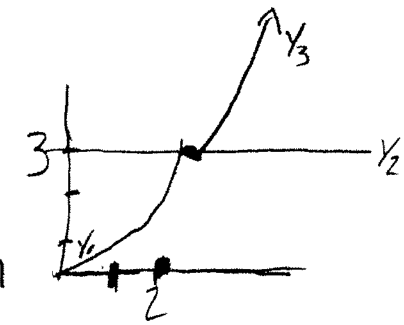


$\boxed{Y=}$ $Y_1=(x^2)/(x\overset{\text{[test 5]}}{<}2)$

$Y_2=3$

$Y_3=(3x-3)/(x\overset{\text{[test] 3}}{>}2)$

$\boxed{\text{Zoom}}$ 2: Zoom in



$\lim\limits_{x\to a^+} f(x)=f(a)$ is discontinuous because the graph has a jump at $x=2$

1.5 # 10 DGK

$$\lim_{x \to \infty} \frac{(2x^2 - x + 1)}{(4x^2 - 3x - 1)} \cdot \frac{\left(\frac{1}{x^2}\right)}{\left(\frac{1}{x^2}\right)}$$

$$\lim_{x \to \infty} \frac{2 - \frac{1}{x} + \frac{1}{x^2}}{4 - \frac{3}{x} - \frac{1}{x^2}}$$

$$= \frac{2}{4} = \frac{1}{2}$$

Section 1.5

- In exercise 29 – 32 determine all verticle and slant Asymptot

(30) $y = \dfrac{x^2+1}{x-2}$

Verticle Asymptotes = 2

Slant Asymptotes $= (x+2)\dfrac{5}{x-2}$

$$\begin{array}{r|l} & x+2 \\ x-2 & x^2+0+1 \\ & -x^2+2x \\ \hline & -2x+1 \\ & -2x+4 \\ \hline & 5 \end{array}$$

Section 2.1

28: Sketch in a plausible tangent line at the given Point or state that there is no tangent line.

$y = \tan^{-1} x$ at $x = 0$

$y' = \dfrac{1}{1+x^2}$

when $x = 0$

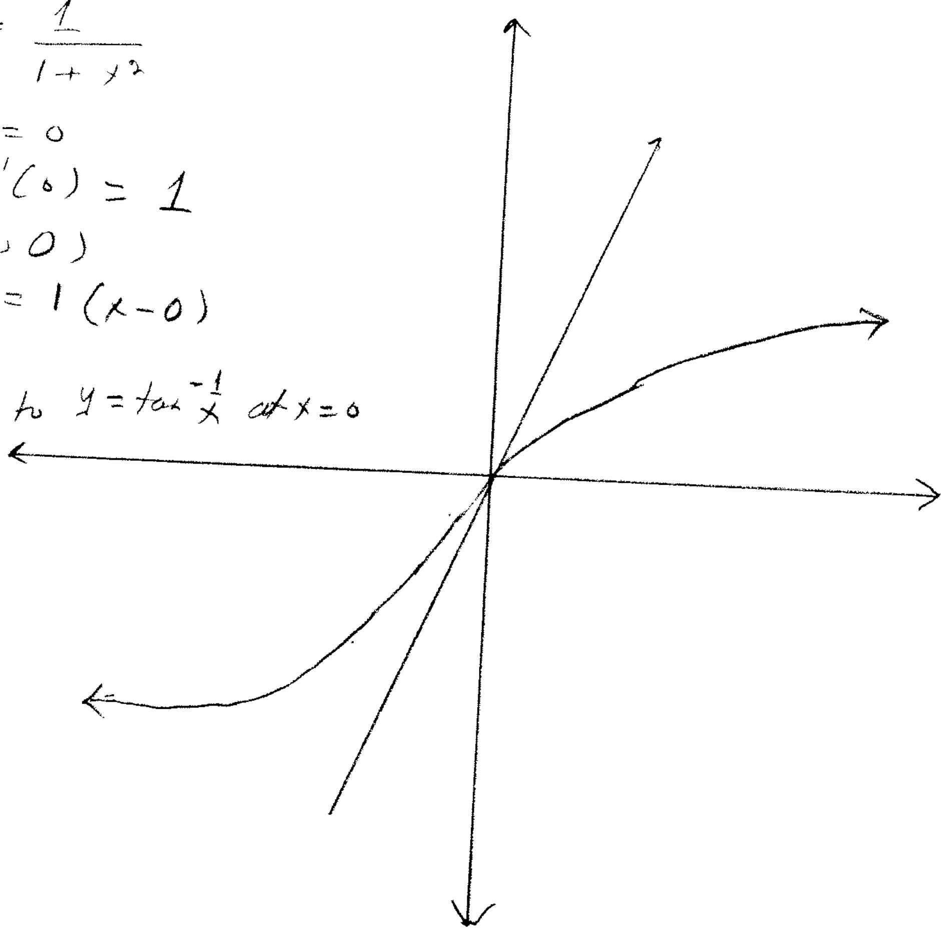
$y'(0) = 1$

$(0, 0)$

$y - 0 = 1(x - 0)$

$y = x$

tangent to $y = \tan^{-1} x$ at $x = 0$



Deutsche Produktion - DP

section 1.5 / 42

$$\lim_{x \to -\infty} \frac{2x^3+7x^2+1}{x^3 - x\sin(x)}$$

$$\lim_{x \to -\infty} \frac{\frac{2\cancel{x^3}}{\cancel{x^3}} + \cancel{\frac{7x^2}{x^3}} + \cancel{\frac{1}{x^3}}}{\frac{x^3}{x^3} - \frac{x\sin(x)}{x^3}}$$

$$\lim_{x \to -\infty} \frac{2}{1}$$

$$\lim_{x \to -\infty} \frac{2x^3+7x^2+1}{x^3 - x\sin(x)} = 2$$

$f(x) = \frac{P(x)}{Q(x)}$ $\quad$ $p \Rightarrow$ degree of $P(x)$

$q \Rightarrow$ degree of $Q(x)$

If

$p < q$ $\quad$ $\lim_{x \to \infty} = 0$

$p > q$ $\quad$ $\lim_{x \to \infty} = \infty$

$p = q$ $\quad$ ratio of leading coefficients

Ted Condo
Grayson Rogers Patrick Wells 2/5/11
Homework #4
Ch. 1.6 #2

2) Find δ in terms of ε (delta in terms of epsilon).

$$\lim_{x \to 1} 3x = 3$$

1st: as x approaches 1, $3x$ approaches 3.

$3(1) = 3 : 3 = 3$

2nd: $|f(x) - L| < \varepsilon$

$|3x - 3| < \varepsilon$ (factor out 3)

$3|x-1| < \varepsilon$ (divide both sides by 3)

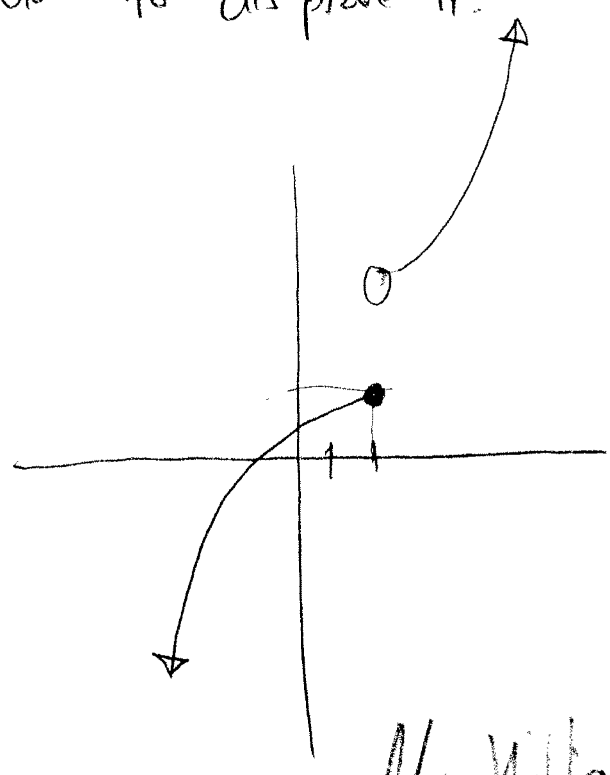
$|x-1| < \frac{\varepsilon}{3}$ Absolute value of $x-1$ is less than $\frac{\varepsilon}{3}$

$\delta = \frac{\varepsilon}{3}$

Delta equals epsilon divided by three.

1.6 #4 | M.A.T- FINISHERS

In order for a limit to exist, given every $\varepsilon > 0$, we must be able to find $\delta > 0$ such that the if/then inequlities are true. To prove that the limit does not exist, we must find a particular $\varepsilon > 0$ such that the if/then equalities are not true for any choice of $\delta > 0$. To understand the logic behind the swapping of the "for every" and "there existing" roles, draw an analogy with the following situation. Suppose The statement, "Everybody loves Somebody" is true. If you wanted to verify the statement, why would you have to talk to every person on earth? But suppose that the statement is not true. What would you have to do to disprove it?



Mo Williams Hiroaki Tsuda Julian Ward

PURPLE PARROTS

1.6 #6

$$\lim_{x \to -1} (3-4x) = 7$$

$$|f(x) - L| < \varepsilon$$

$$|3 - 4x - 7| < \varepsilon$$

$$|-4x - 4| < \varepsilon$$

$$-4|x+1| < \varepsilon$$

$$|x+1| > \frac{\varepsilon}{-4}$$

$$\delta = \frac{\varepsilon}{-4}$$

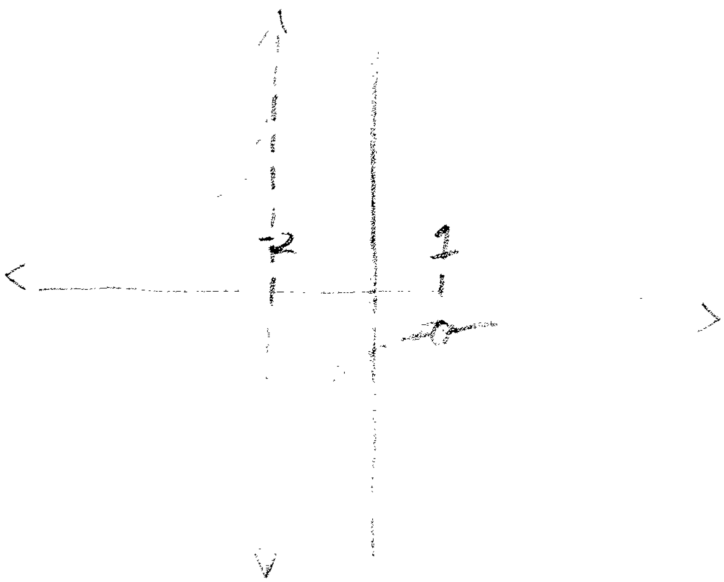
Timothy Lukowicz
Abraham Sherman

section 2.1

26) $f(x) = \frac{1-x}{x^2+x-2}$

$f(x) = \frac{-1\cancel{(x-1)}}{\cancel{(x-1)}(x+2)}$ $\qquad x \neq 1, -2$

$f(x) = -1/x+2$ $\qquad y_1 = -1/(x+2)$



$\lim_{x \to -2^-} -1/x+2 = \infty$

$\lim_{x \to -2^+} -1/x+2 = -\infty$

$\lim_{x \to -\infty} -1/x+2 = 0$

$\lim_{x \to \infty} -1/x+2 = 0$

$\lim_{x \to 1} -1/x+2 = -1/3$