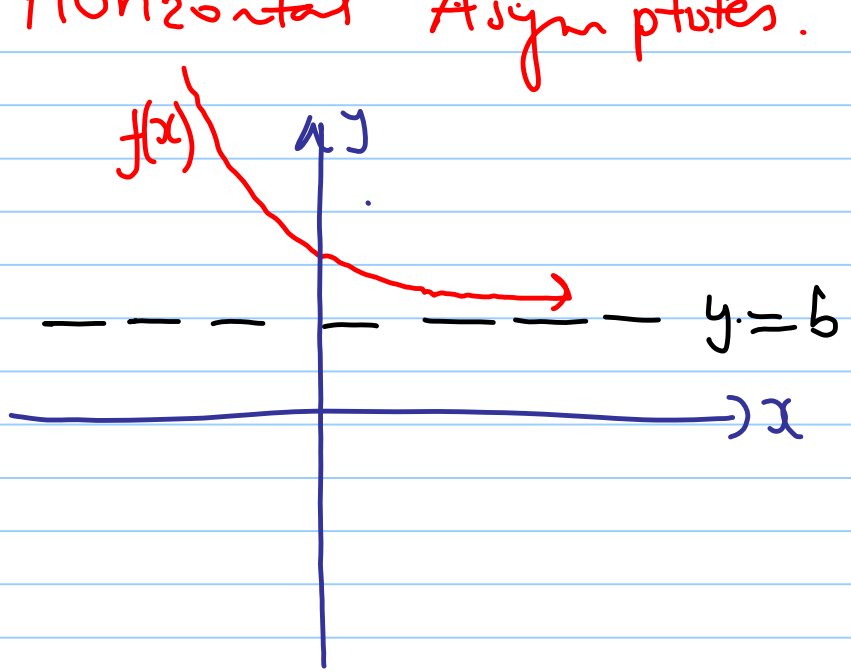
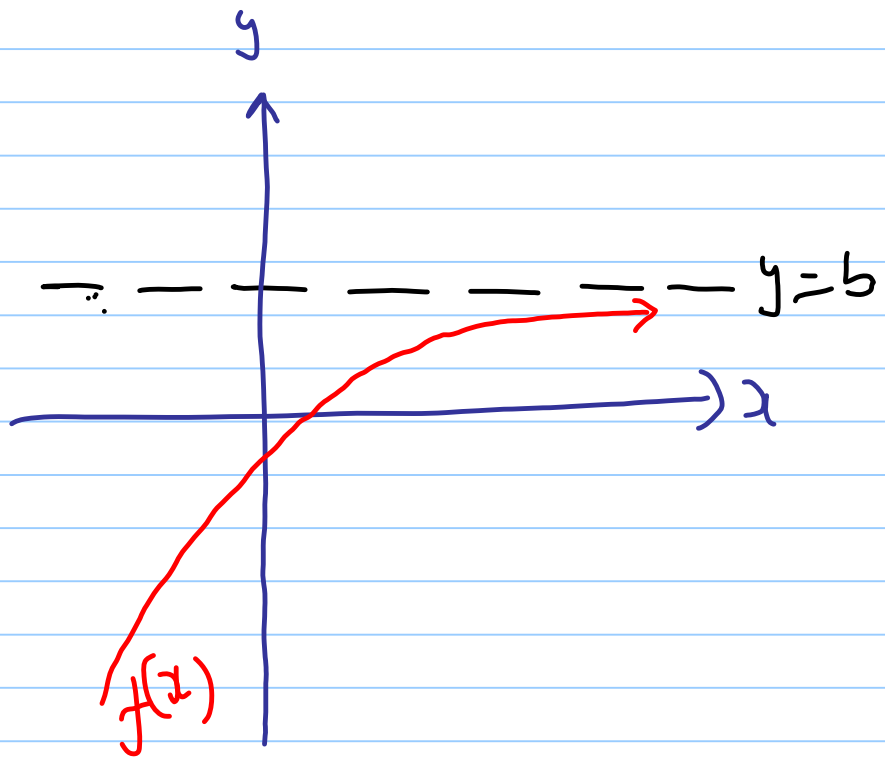
October 12, 2010

Note Title 10/12/2010

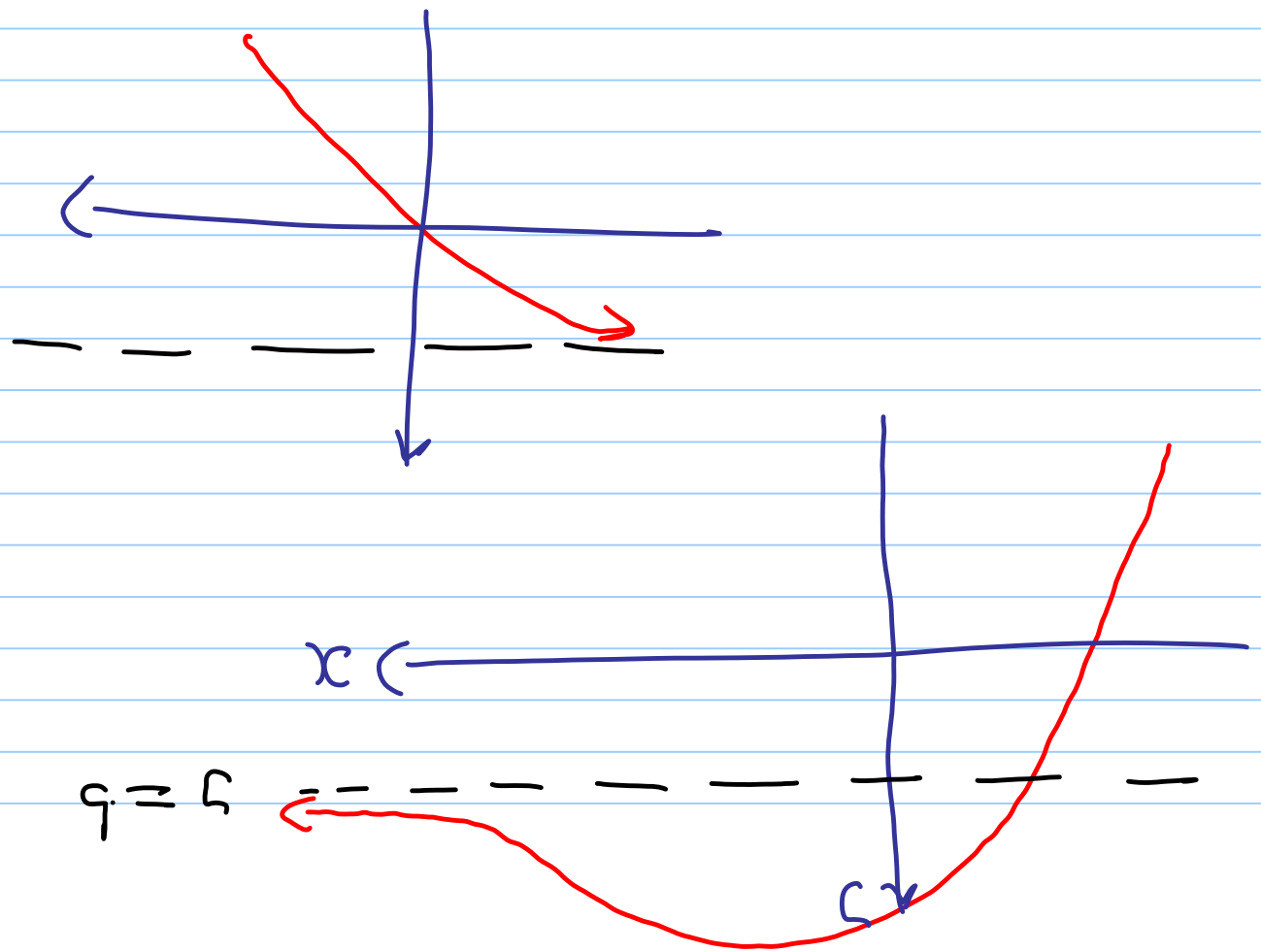
100	100	100							
90	92	93	95	95	95	96	97	99	99
84	85	85	85	87	89	89			
70	72	72	74	75	76	76	77	78	
63	65	65	67						
44									

Horizontal Asymptotes..

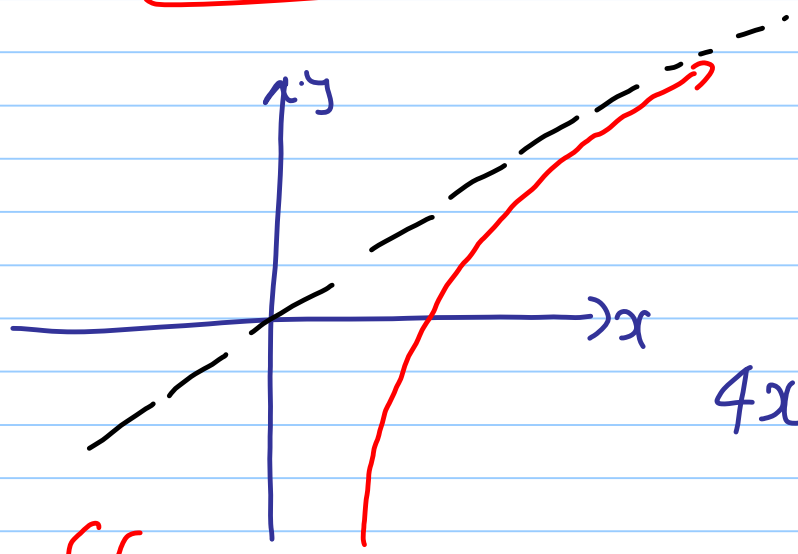




As $x \to \infty$ $\quad f(x) \to b$


x
y = b

SLANT ASYMPTOTE



$$h(x) = \frac{8x^3 + 3}{4x^2 + 1}$$

$$\begin{array}{r|l} & 2x \\ \hline 4x^2+1 & 8x^3 + 0x^2 + 0x + 3 \\ & \underline{8x^3 \quad\quad + 2x} \\ & -2x + 3 \end{array}$$

Remainder

Aside

$$\begin{array}{r|l} & 66 \\ \hline 3 & 199 \\ & \underline{18} \\ & 19 \\ & \underline{18} \\ & 1 \end{array}$$

remainder

$$\frac{199}{3} = 66 + \frac{1}{3}$$

$$\frac{8}{5} = 1 + \frac{3}{5}$$

$$\frac{8x^3+3}{4x^2+1} = \boxed{2x} + \frac{-2x+3}{4x^2+1}$$

Slant asymptote

Example

$$f(x) = \frac{x^2+9x+20}{x-3}$$

$$
\begin{array}{r}
x+12 \\
x-3 \;\overline{)\; x^2+9x+20} \\
-\;\underline{x^2-3x} \\
12x+20 \\
\underline{12x-36} \\
56
\end{array}
$$

← Remainder

$\therefore$ Slant asymptote

$y = x+12.$

$$\frac{x^2+9x+20}{x-3} = \boxed{x+12} + \frac{56}{x-3}$$

Exponential functions

$f(2) = 3^2 = 9$

$g(-3/2) = \left(\frac{1}{4}\right)^{-3/2}$

$x^{-n} = \frac{1}{x^n}$

$= \left(\frac{4}{1}\right)^{3/2} = \left(4^{1/2}\right)^3 = (2)^3 = 8$