APCalculusAB
Wednesday,September4,2013

Bellwork:

Test tomorrow.. you can start as early as 7:15am

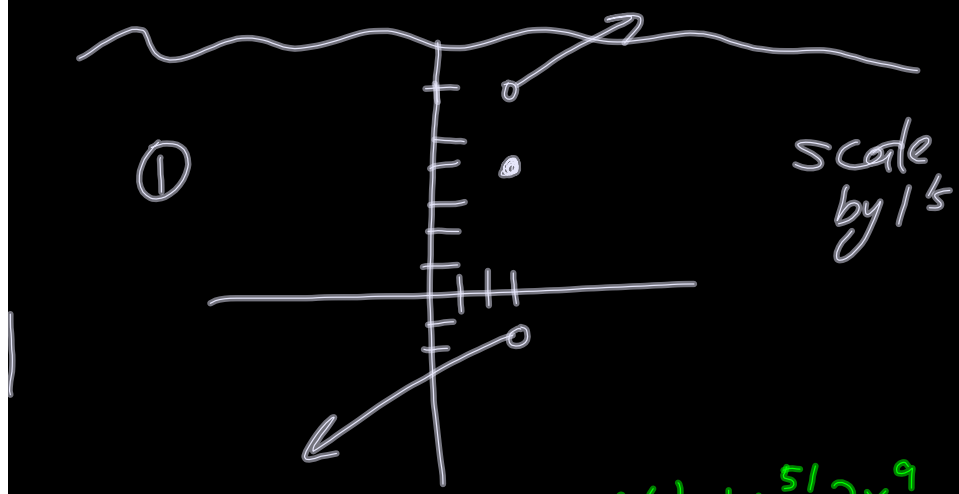
1. Sketch the graph of a function with the following attributes:

f(3) = 4 , $\lim_{x\to 3^-} f(x) = -2$, $\lim_{x\to 3^+} f(x) = 6$.

limit as x approaches three from the left is -2.
limit as x approaches three from the right is 6.

2. Find the equation of a rational function that has a limit of -2 as x approaches positive infinity.

③ Evaluate $\lim_{x\to a} \frac{x^2-a^2}{x^4-a^4}$



①

scale by 1's

② $f(x) = -2$

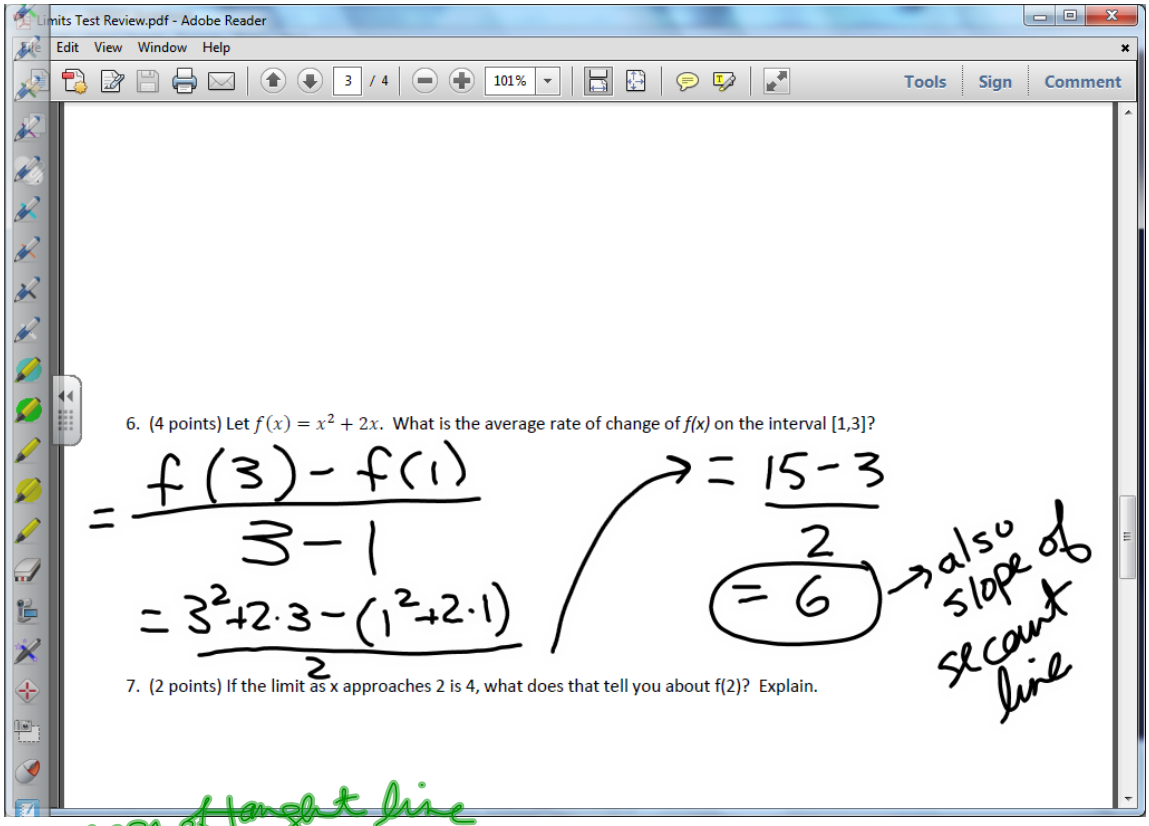
$h(x) = \frac{1000^{51} - 2x^9}{x+3x^3-15x^5+x^9}$

$g(x) = \frac{-2x^2-x}{x^2}$

③ $\lim_{x\to a} \frac{x^2-a^2}{x^4-a^4} = \frac{a^2-a^2}{a^4-a^4} = \frac{0}{0}$

$\lim_{x\to a} \frac{x^2-a^2}{(x^2-a^2)(x^2+a^2)}$

$\lim_{x\to a} \frac{1}{x^2+a^2} = \frac{1}{a^2+a^2} = \frac{1}{2a^2}$



eqn of ~~tangent line~~

$f(x) = x^3 - x^2 + 1 \quad @ \; x = -1$

$m_{tan} = \lim_{h \to 0} \frac{f(x+h) - f(x)}{h}$

$m_{tan} = \lim_{h \to 0} \frac{f(-1+h) - f(-1)}{h}$

$m_{tan} = \lim_{h \to 0} \frac{(h-1)^3 - (h-1)^2 + 1 - \left((-1)^3 - (-1)^2 + 1\right)}{h}$

$m_{tan} = \lim_{h \to 0} \frac{h^3 - 3h^2 + 3h - 1 - (h^2 - 2h + 1) + 1 - (-1 - 1 + 1)}{h}$

$= \lim_{h \to 0} \frac{h^3 - 4h^2 + 5h}{h}$

$= \lim_{h \to 0} h^2 - 4h + 5$

$m_{tan} = 5$