

AP Calculus AB

8/22 and 8/23

8/22 Bellwork:

Write the equation of the line in point slope form for each case below:

1. $(4, -7)$ and $(3, 7)$ $\frac{-7-7}{4-3}$
2. (a, b) and (c, d) $\frac{d-b}{c-a}$
3. $(-1, 4)$ and $(x, f(x))$

$$y - y_1 = m(x - x_1)$$

$$y + 7 = -14(x - 4) \rightarrow y = -14(x - 4) - 7$$

$$-14x + 56$$

$$y = -14x + 49$$

$$14x + y = 49$$

$$(a, b) \quad (c, d)$$

$$\textcircled{2} \quad m = \frac{d-b}{c-a}$$

$$y - b = \left(\frac{d-b}{c-a}\right)(x - a)$$

$$y = \left(\frac{d-b}{c-a}\right)(x - a) + b$$

$$\textcircled{3} \quad (-1, 4) \quad (x, f(x))$$

$$m = \frac{f(x) - 4}{x + 1}$$

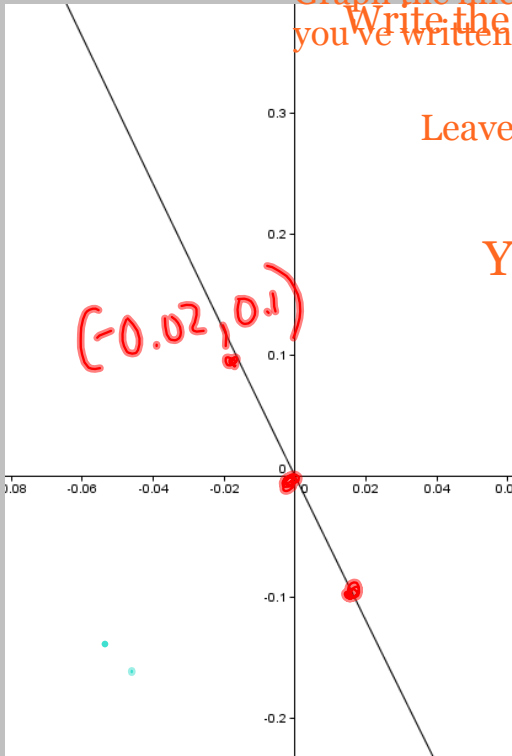
$$y - 4 = \left(\frac{f(x) - 4}{x + 1}\right)(x + 1)$$

$$y = \left(\frac{f(x) - 4}{x + 1}\right)(x + 1) + 4$$

used $(x, f(x))$

Graph the line on your calculator (same window) once you've written the equation.

Write the equation of this line.



Leave your answer in point-slope form.

You don't have to simplify.

$$y = x^3 + x^2 - 6x$$

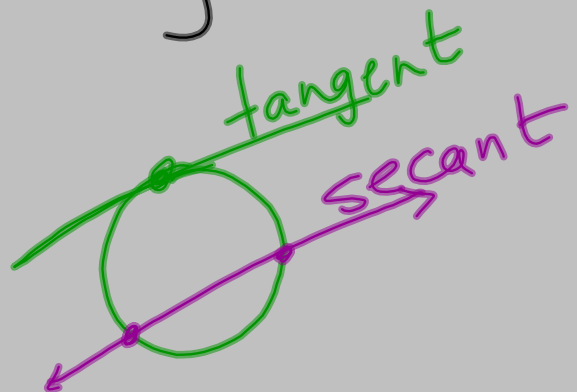
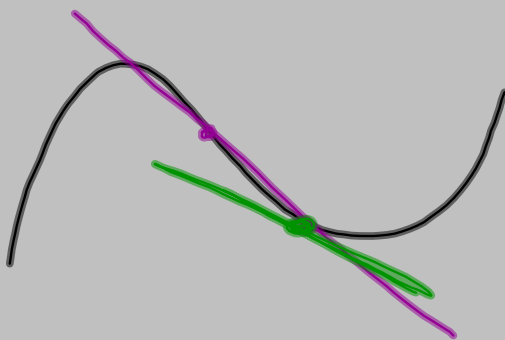
$$y = -5x$$

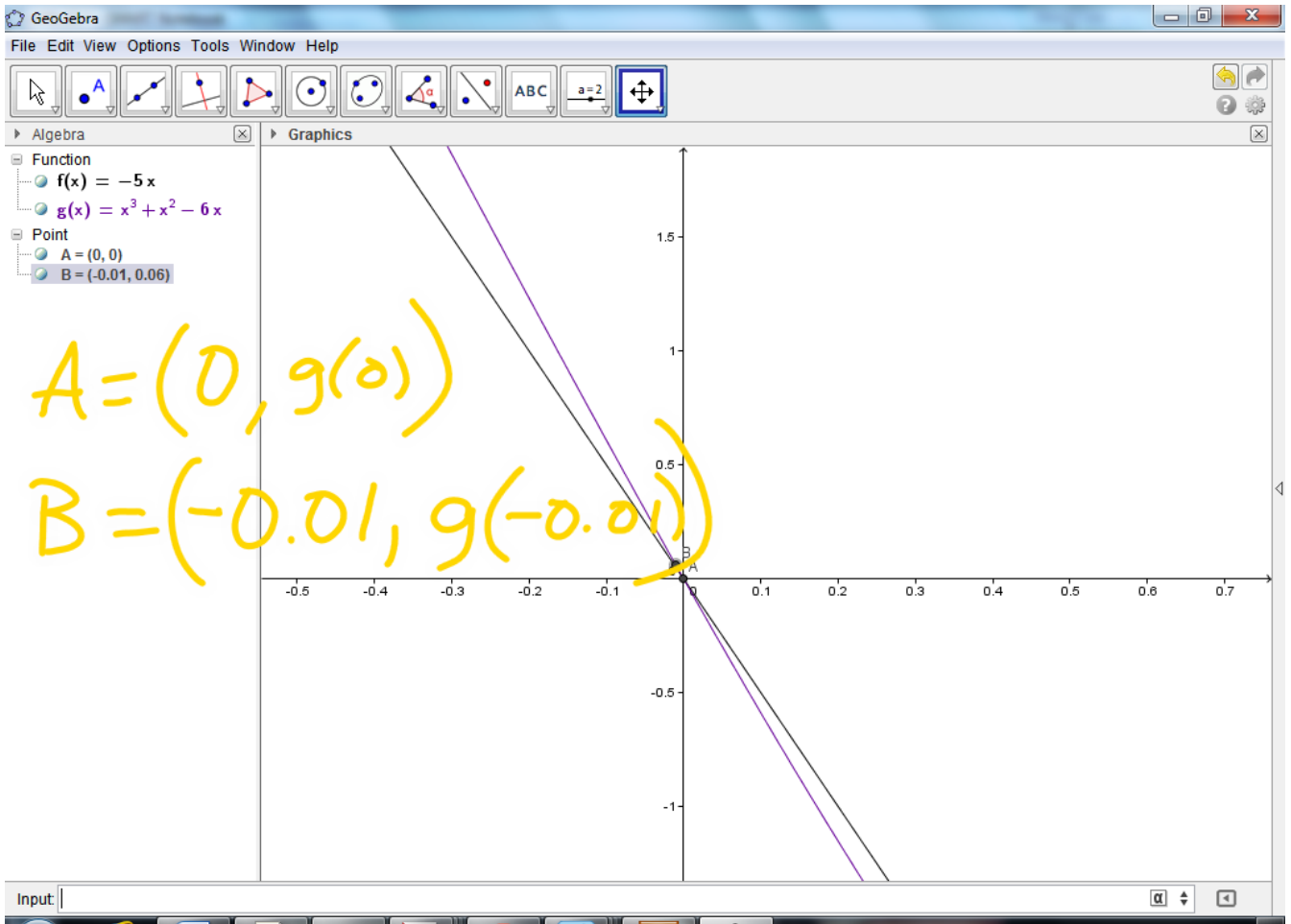
$$y = \frac{0.1}{-0.02}(x + 0.02) + 0.1$$

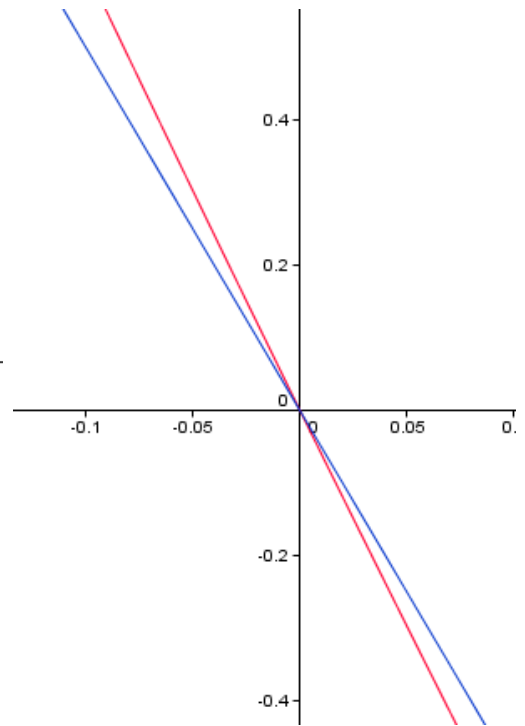
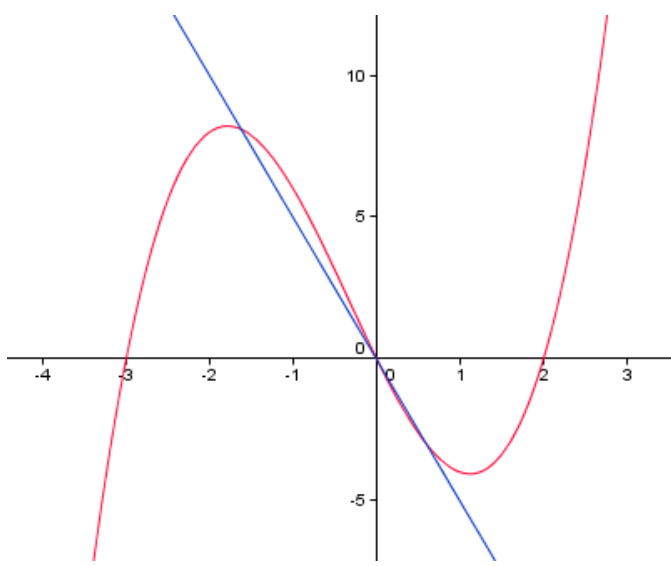
Now graph $y = x^3 + x^2 - 6x$

Change your window to be X: [-4,3] and Y: [-5,10]

local
linearity

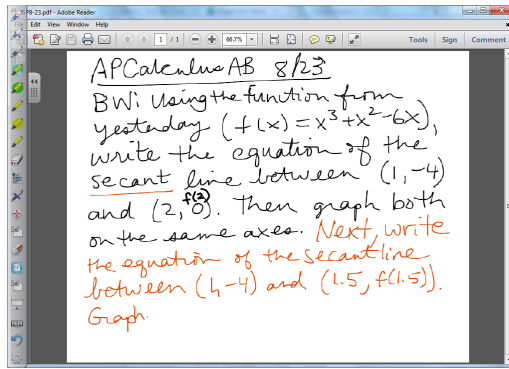






8/23...BW...See online notes

HW...Tangent line homework on web



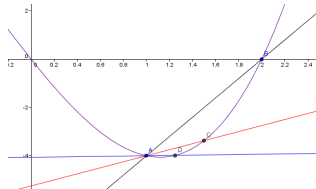
secant

$$y + 4 = 2(x - 0)$$

$$y + 4 = \frac{f(1.5) + 4}{0.5}(x - 1)$$

$$y + 4 = \frac{f(1.25) + 4}{0.25}(x - 1)$$

Moving pt B, closer to pt A.



Let's call the point we're moving Q.
 Call the fixed point P. In this ex. $P(1, -4)$.

$$Q(x, f(x))$$

$$\text{slope of } PQ? \quad m = \frac{f(x) + 4}{x - 1}$$

$$y + 4 = \left(\frac{f(x) + 4}{x - 1} \right) (x - 1) \rightarrow \text{Eqn of } \underbrace{PQ}_{\text{secant}}$$

Find eqn of tangent line \rightarrow

move Q really really really REALLY close to P $\hat{=}$ find slope.

$Q(x, f(x))$	Slope: $\frac{f(x) + 4}{x - 1}$
$(2, 0)$	4
$(1.5, f(1.5))$	1.25
$(1.25, f(1.25))$	0.06
$(1.1, f(1.1))$	-0.59 (approx)
$(1.01, f(1.01))$	-0.959
$(1.001, f(1.001))$	$\frac{f(1.001) + 4}{1.001 - 1} \approx -0.995$

