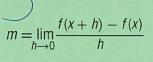
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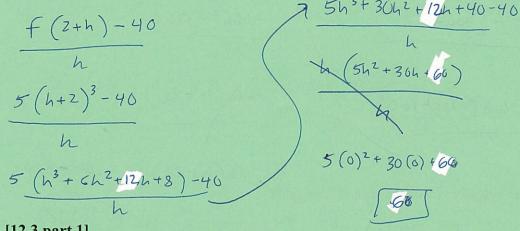
12.3 (part 2)

1) [Review] Find the slope of the tangent line to the graph of $f(x) = 5x^3$ at (2, 40).



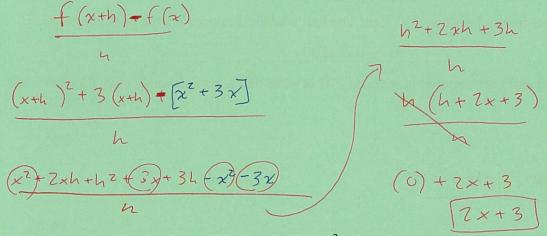
$$v(t) = \lim_{h \to 0} \frac{f(t+h) - f(t)}{h}$$

Submit your response via Socrative: 08EC238B (it's a zero)



[12.3 part 1]

Ex. A: Find an equation for the slope of the graph of $y = x^2 + 3x$ at any point.



2) Find an equation for the slope of the graph of $y = x^2 + 3x - 2$ at any point.

Submit your response via Socrative.

$$\frac{(x+h)^{2}+3(x+h)-2-[x^{2}+3x-2]}{h}$$

$$\frac{(x^{2}+2xh+h^{2}+3h-2)(x^{2}+3x+2)}{h}$$

$$\frac{h^{2}+2xh+3h}{h}$$

$$\frac{h}{(h+2x+3)}$$

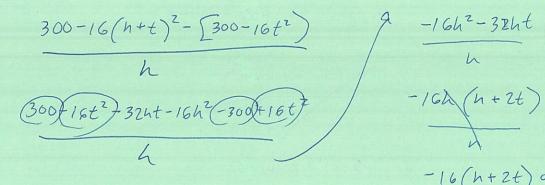
$$\frac{1}{h}$$

$$\frac{1}{h}$$

Ex. B: Tourist standing on a 300 foot tall viewing tower often drop coins into the fountain below. The height of a coin falling from the tower after t seconds is given by:

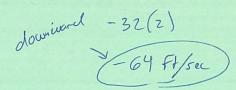
$$h(t) = 300 - 16t^2$$

Find the equation for the instantaneous velocity v(t) of the coin at any point in time. i)



-16(h+2t) or -164=32t

Find the instantaneous velocity v(t) of the coin at 2 seconds. ii)



3) A billiard ball is dropped from a height of 100 feet. The ball's height s at time t is the position function:

$$s = -16t^2 + 100$$

where s is measured in feet and t is measured in seconds. What's the ball's instantaneous velocity at t = 1 and t=2?

Submit your response via Socrative.

$$-16(h+t)^{2}+100-[-16t^{2}+100]$$
h
$$-16h^{2}-32ht(16t^{2})+100+16t^{2}-100$$
h
$$-16h^{2}-32ht(16t^{2})+100+16t^{2}-100$$

ta (-16h-32t) -16(0)-32t

-32t

t=1 is -32 ft/sec

t=2 is -64 ft/sec