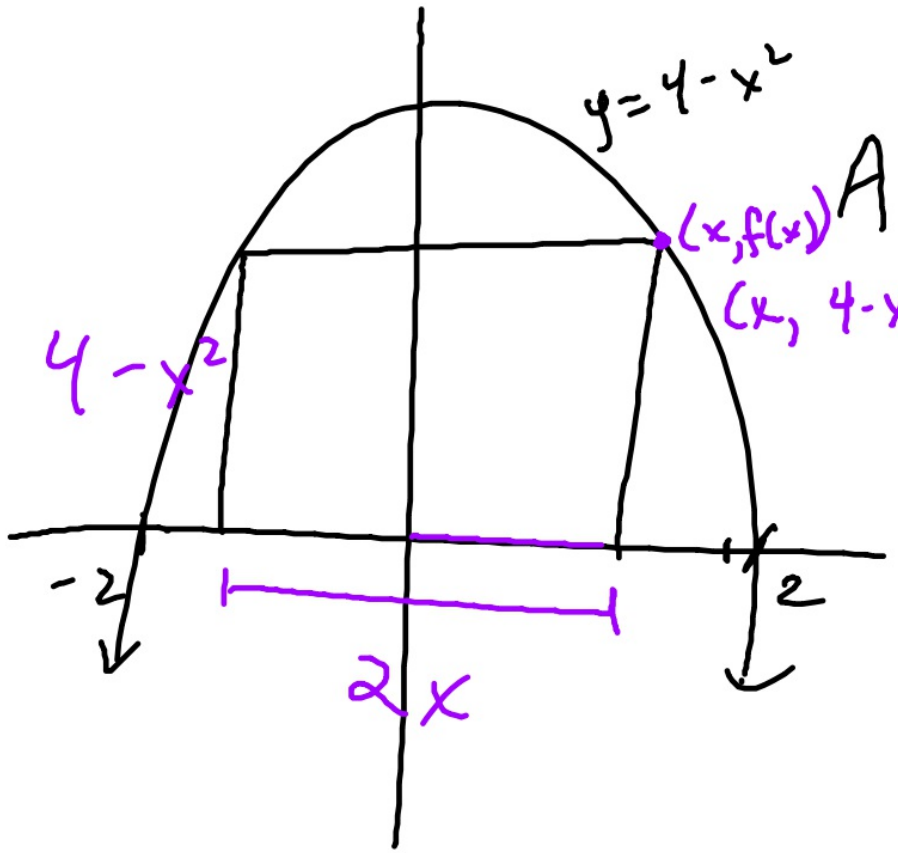

B H

$A(x) = 2x \cdot (4 - x^2)$

$A(x) = 8x - 2x^3$

$A'(x) = 8 - 6x^2 = 0$

$2(4 - 3x^2) = 0$

$x^2 = \frac{4}{3}$

$x = \pm\sqrt{4/3} \approx 1.155$

Helpful hints on winter break packet of misery:

#6: find each position's functions velocity function (derivative of each), graph them as y1 and y2 in your calculator or desmos, find number of intersections

#7: skip for now

#8: choose suitable numbers for a and b and experiment with the velocity function

I: is x((a+b)/2) positive or negative?
II: is v(a)=0?
III: is v(b) positive?

To find v(t) you will need to use the power rule (and chain, but derivative of insides =1)

#9: note that $g'(x) = f'(f(x))f'(x)$ [chain rule]
then plug in x=1
to approximate f'(1), use (0.5,1.8) and (1.5,2.4) and the 8th grade slope formula

#11: note that
I: the left side of the equal sign looks a lot like f'(x) at a certain number...
II: average rate of change (think of MVT, or just old fashioned slope formula)
III: concave up f" positive....concave down f" negative

#13: uh, see earlier notes from this PDF?

#14: this problem actually has two possible answers (whoops). What do I mean? c could be positive or negative

#15: plug $\tan^{-1}(x^3-x)$ into y_1, put 2 as y_2 in calc, find number of intersections