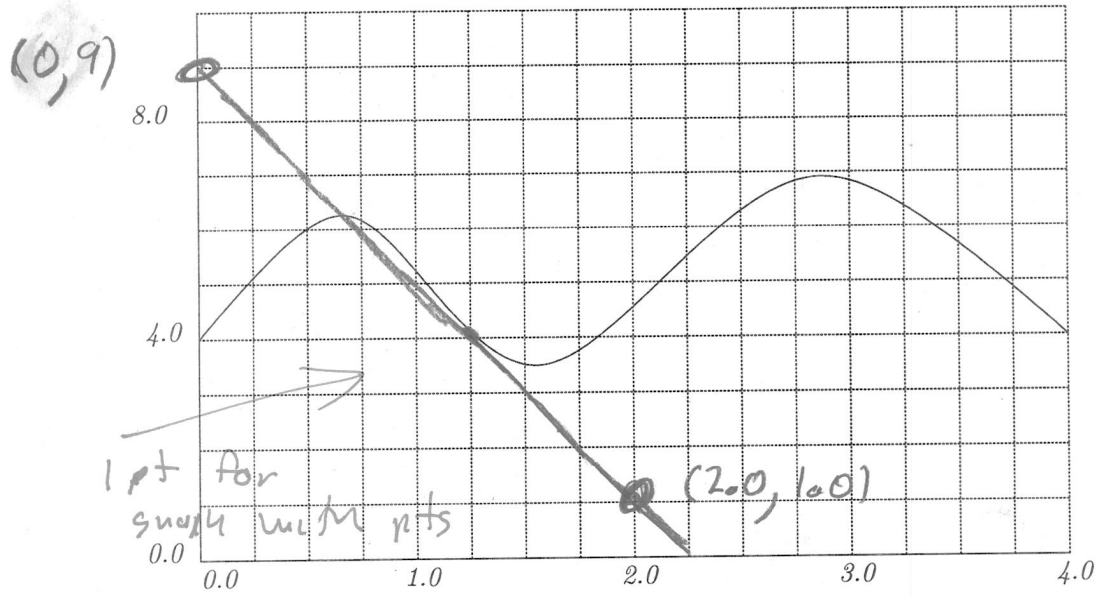
Mathematics 122 Quiz 12 Name: Key



(1) The graph is of $y = f(x)$. Draw the tangent line where $x = 1.25$, label two points on this line showing both the x and y coordinate and use this points to estimate $f'(1.25)$. 1 pt.

$f'(1.25) =$ slope of tangent line $= \frac{\Delta y}{\Delta x} = \frac{1-9}{2-0} = \frac{-8}{2} = -4$

$f'(1.25) \approx$ -4

(2) The weight in pounds, W, of a tree is a function of its height, h, in feet. That is $W = f(h)$. Assume that $f(10) = 300$ and $f'(10) = 45$.

1 pt

(a) What are the units of 45? HINT: $f'(h) = \frac{dW}{dh}$.

Units are lbs/ft

2 pts

(b) With this data estimate the weight of a tree that is 10.5 feet tall. (That is estimate $f(10.5)$)

$f(x) \approx f(a) + f'(a)(x-a)$

In our case this is

$f(10.5) \approx f(10) + f'(10)(10.5-10)$

$= 300 + 45(.5)$

$= 325.5$

$f(10.5) \approx$ 322.5 lbs.