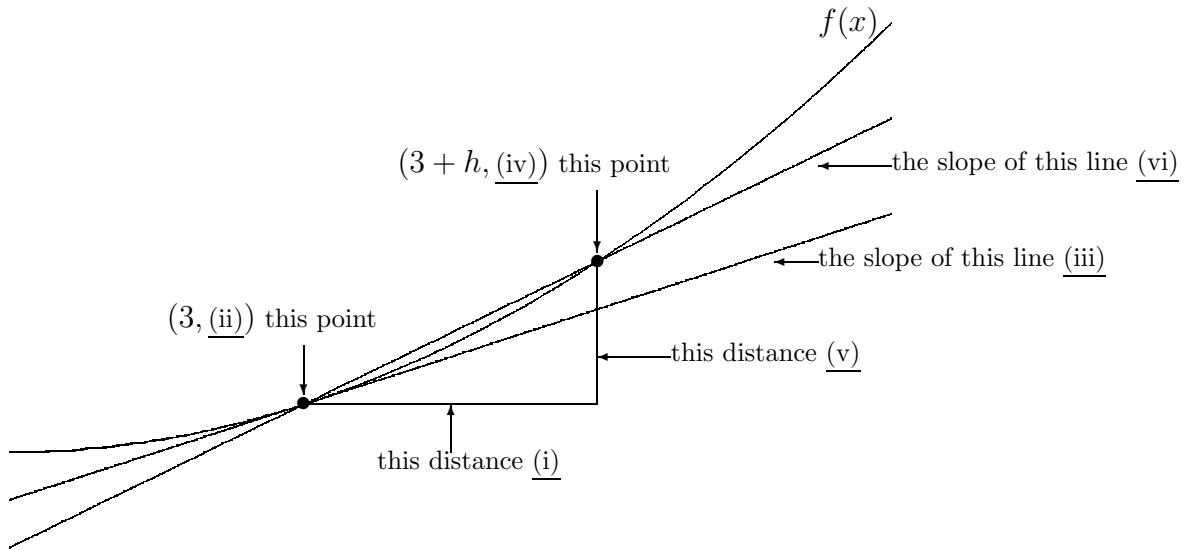
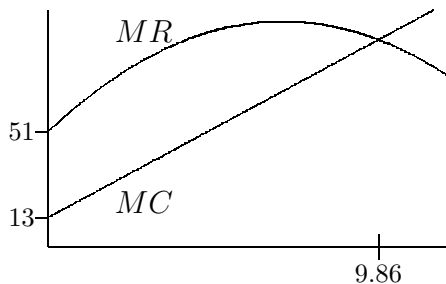


MATH 112 A - Spring 2003  
Exam 1, Version 1 - Hints and Answers

1. (a) (4 points) ANSWERS:  $f'(x) = 2x - 4$ , slope= $f'(3) = 2$   
 (b) (6 points)  $\frac{f(3+h) - f(3)}{h} = (0)h^2 + (1)h + 2$   
 (c) (6 points)



2. (a) (4 points) ANSWER:  $q = 5.5$   
 (b) (6 points) HINT: Compute  $MR = R'(q)$ , a quadratic function. Use the vertex formula to compute the quantity that yields maximum  $MR$ . Plug this quantity back into  $R'(q)$  to find the maximum  $MR$ .  
 ANSWER: 100 dollars  
 (c) (4 points) HINT: Find where  $MR = MC$ .



ANSWER:  $q = 9.86$  hundred clocks

- (d) (4 points) HINT:  $TR$  increases when  $MR$  is positive. So, you need the largest interval on which  $MR$  is both positive and increasing.  
 ANSWER: from  $q = 0$  to  $q = 7$

3. (a) (4 points) HINT: You need to compute  $\frac{d(2.5) - d(2)}{0.5}$ . Let  $p = 2$  and  $h = 0.5$ .  
Use the formula given to compute  $d(2.5) - d(2)$  and divide by 0.5.  
ANSWER: 116.75 feet per second
- (b) (4 points) HINT: You want a formula for  $d(s) - d(1)$ . Let  $p = 1$  and  $p + h = s$ .  
Then  $h = s - p = s - 1$ .  
ANSWER:  $d(s) - d(1) = 113(s - 1) + \frac{3}{2}(s - 1)^2 = \frac{3}{2}s^2 + 110s - 111.5$ .
- (c) (4 points) HINT: You need to compute  $d'(p)$ . Compute  $\frac{d(p+h) - d(p)}{h}$  and let  $h$  go to 0.  
ANSWER: instantaneous speed =  $110 + 3p$
- (d) (4 points) HINT: You first need to compute  $d(12)$ . This will be the same as  $d(12) - d(0)$ . Take  $p = 0$  and  $h = 12$  in the formula for  $d(p+h) - d(p)$ . That will be the distance travelled over the first 12 seconds. Divide by 12 seconds to get the average trip speed.  
ANSWER: average trip speed = 128 feet per second