

MATH 112 – EXAM I Hints and Answers  
Version Delta  
Winter 2009

1. ANSWER:  $f'(x) = -\frac{5}{2}x^{-7/2} + 8x^{-3} - 5x^{-2}$
2. (a) (2 points) ANSWER: approximately 7.3 minutes  
(b) (4 points) ANSWER: approximately 1.75 feet per minute; down  
(c) vi; iv; iii; i
3. i. (4 points) ANSWER: 0.3018  
ii. (4 points) ANSWER:  $\frac{-0.6}{(2.2 + 5r)(2 + 5r)}$   
iii. (2 points) ANSWER:  $\frac{-15}{(2 + 5a)^2}$   
iv. (4 points) HINT: Set  $\frac{-15}{(2 + 5a)^2} = -0.15$  and solve for  $a$ .  
ANSWER:  $a = -2.4$  or  $1.6$
4. (4 points each)
  - (a) ANSWER:  $MR(q) = -8q + 70$ ;  $MC(q) = 3q^2 - 25.8q + 55.72$
  - (b) HINT: Find the “ $y$ ”-coordinate of the vertex of  $MC(q)$ .  
ANSWER: 0.25 dollars per Item (or dollars)
  - (c) ANSWER:  $q = 8.75$  thousand Items
  - (d) HINT: Profit is increasing over the interval on which  $MR$  is larger than  $MC$ . If you sketch rough graphs of  $MR$  and  $MC$ , you will see that  $MR$  is larger than  $MC$  from  $q = 0$  until  $MR = MC$ . So, set  $MR = MC$  and solve for  $q$ .  
ANSWER: from  $q = 0$  to  $q = 6.649$  thousand Items