

MATH 111C – EXAM II Hints and Answers

Version Alpha

Autumn 2010

1. (a) (5 points) ANSWER:  $\frac{f(x+5) - f(x)}{5} = -2x + 7$
- (b) (4 points) HINT: Find the formula for  $f(x) - g(x)$  and sketch the graphs of  $g(x)$  and  $f(x) - g(x)$ . Note the intervals on which each function is increasing.  
ANSWER: from  $x = 1.5$  to  $x = 2.4$
- (c) (4 points) HINT: Sketch the graph of  $f(x)$  and note its behavior on the interval from  $x = 7.25$  to  $x = 7.99$ .  
ANSWER:  $x = 7.25$
2. (a) (3 points) ANSWER: 26.86 dollars per Thing
- (b) (4 points) ANSWER:  $VC(q) = 0.1q^3 - 3q^2 + 35q$ ;  $AVC(q) = 0.1q^2 - 3q + 35$
- (c) (5 points) HINT: Set  $AVC(q) = 18$  and solve the resulting quadratic equation.  
ANSWER:  $q = 7.58$  and  $22.42$  hundred Things
- (d) (4 points) HINT: The shutdown price is the smallest value of  $AVC$ . Find the “ $y$ ”-coordinate of the vertex of  $AVC(q)$ .  
ANSWER: 12.50 dollars per Thing
- (e) (4 points) HINT: Since profit is 0 when  $q = 20$ ,  $TR(20) = TC(20)$ . You can compute that  $TC(20) = 315$ . The graph of  $TR$  is a straight line that goes through the points  $(0, 0)$  and  $(20, 315)$ .  
ANSWER:  $TR(q) = 15.75q$
3. (a) (4 points) HINT: Compute  $B(25) - B(4)$ .  
ANSWER: 21 gallons
- (b) (4 points) HINT: Set  $B(t) = 42.7$  and solve for  $t$ . Plug that value of  $t$  into  $A(t)$ .  
ANSWER: 169.75 gallons
- (c) (6 points) HINT: Set  $B(t) - A(t) = 2$  and solve for  $t$ .  
ANSWER:  $t = 0.31$  and  $2.09$  minutes
- (d) (3 points) ANSWER: iii and v