

Math 111C - Winter 2003  
Final Exam  
Hints and Answers

1. (a) ANSWER: about 2 thousand gallons per hour  
(b) ANSWER: about 4 thousand gallons  
(c) ANSWER: about 3:30 AM
2. (a) HINT: Find the equation of the line through the two given data points. ANSWER:  $p = -0.2q + 26$   
(b) ANSWER:  $TR(q) = -0.2q^2 + 26q$   
(c) HINT: Profit is  $TR - TC$ . So,  $200 = TR(30) - TC(30)$ . Use the formula for  $TR$  from part (b) to compute  $TR(30) = 600$ . Then  $TC(30) = 400$  and cost per pen is  $\$400/30$  pens.  
ANSWER:  $\$13.33$   
(d) HINT: Find the vertex of  $TR(q)$ .  
ANSWER: 65
3. (a) ANSWER:  $\$111.25$   
(b) ANSWER:  $\$26.5$   
(c) ANSWER:  $\$500$   
(d) ANSWER:  $q = 4.11$
4. (a) i. multiplicative, multiplier=3  
ii. recursive:  $A(k+1) = 3A(k)$   
iii. explicit:  $A(k) = 3^{k-1}$   
(b) neither  
(c) i. additive, increment=7  
ii. recursive:  $A(k+1) = A(k) + 7$   
iii. explicit:  $A(k) = -2 + 7(k-1)$
5. (a) HINT: Start by writing the account balance as an exponential function.  
ANSWER:  $P = \$8977.52$   
(b) ANSWER: 21.03 years  
(c) ANSWER 7.37%
6. (a) ANSWER: 6.58 years  
(b) ANSWER: 6.37%  
(c) ANSWER: 8.35%