

MATH 111C – EXAM I Hints and Answers
Version Alpha
Autumn 2006

1. (4 points each)
 - (a) ANSWER: approximately 0.67 miles per minute
 - (b) ANSWER: approximately 0.357 miles per minute
 - (c) ANSWER: from about 4.6 to 6.6 or from about 21.8 to 23.8
 - (d) ANSWER: $t \approx 2$ minutes

2.
 - (a) (2 points) ANSWER: approximately \$4.80
 - (b) (4 points) HINT: $AC(2000) = \$6.50$ per Thing. But $AC(2000) = \frac{TC(2000)}{2000}$.
ANSWER: \$13,000
 - (c) (4 points) ANSWER: \$8,000
 - (d) (2 points) HINT: $FC = TC(2000) - VC(2000)$
ANSWER: \$5,000
 - (e) (5 points) HINT: The graph of marginal revenue is a horizontal line at height \$6 per Thing. Profit is maximized at the quantity at which MR falls below MC . This occurs at $q \approx 3400$ Things. Maximum profit is then $TR(3400) - TC(3400)$.
ANSWER: $q \approx 3400$ Things; max profit is approximately \$3910.

3.
 - (a) (5 points) TRANSLATION: There are fewer cars in the lot at $t = 6$ than at $t = 7$.
This is TRUE.
 - (b) (4 points) HINT: The overall rates will be the same at the times when the in and out graphs intersect. (NOTE: The graphs do intersect at $t = 0$, but there is no overall rate of flow at $t = 0$. Why not?)
ANSWER: $t \approx 14$
 - (c) (4 points) ANSWER: any one-hour interval between about 3 and 14 is acceptable
 - (d) (4 points) ANSWER: approximately 31 cars per hour