MATH 111 – EXAM II Hints and Answers
Version Alpha
Autumn 2006

1. (a) (4 points) HINT: Compute $TR(4) - TR(4.001)$.
   ANSWER: 0.017001 thousand dollars or \$17
   (b) (4 points) HINT: $FC = TC(0) = 10$ and $VC(q) = TC(q) - FC = q^2 + 9q$. Compute $VC(10)$ (which is measured in thousdands of dollars) and divide by 10 thousand Framits to get $AVC(10)$.
   ANSWER: 19 dollars per Framit
   (c) (5 points) HINT: $TR(q) = 22q$. Set $TR(q) = TC(q)$ and solve for q. The smallest value of q that you get will be the smallest quantity at which you do not take a loss.
   ANSWER: $q = 0.821$ thousand Framits

2. (4 points each)
   (a) ANSWER: $f(x) = -0.3x + 1.2$
   (b) HINT: $A(x) = x \cdot f(x) = -0.3x^2 + 1.2x$. The graph of the area function is a parabola that opens down. It increases from $x = 0$ to the x-coordinate of the vertex.
   ANSWER: from $x = 0$ to $x = 2$
   (c) HINT: Set $A(x) = 1$ and solve for x. Choose the larger of the two solutions.
   ANSWER: $x = 2.82$

3. (4 points each)
   (a) ANSWER: $R(t) = 4 - 4t$
   (b) ANSWER: $A(t) = -2t^2 + 13.75t + 50$
   (c) HINT: Find the "y"-coordinate of the vertex of $A(t)$.
   ANSWER: 73.63 gallons

4. (a) (4 points) HINT: Set $MR = MC$ and solve for q.
   ANSWER: $q = 268$ Bobbles
   (b) (4 points) HINT: Set $MR - MC = 94.50$ and solve for q.
   ANSWER: $q = 163$ Bobbles
   (c) (5 points) HINT: $TR(q) = -0.25q^2 + 800.25q$ and $AR(q) = \frac{TR(q)}{q} = -0.25q + 800.25$. Set $AR = 725.25$ and solve for q.
   ANSWER: $q = 300$ Bobbles