MATH 111B – EXAM I Hints and Answers
Version Alpha
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1. (4 points each)

   (a) HINT: $VC(5000) = TC(5000) - FC$; $TC(5000) = 40,000$ and $FC = TC(0) = 5,000$
   ANSWER: \$35,000

   (b) ANSWER: approximately \$4.60 per Thing

   (c) HINT: Find the slope of the line tangent to the TC graph at $q = 1000$.
   ANSWER: approximately \$3

   (d) HINT: The graph of TR is a diagonal line with slope 6. Find the larger quantity at which the graphs of TR and TC intersect.
   ANSWER: approximately 4,300 Things

2. (a) (4 points) ANSWER: $D(4) = 3 + 1.25 + 1.75 - 0.75 - 1.5 = 3.75$ feet

   (b) (4 points) HINT: Charlie is getting closer to Lola whenever the change in the distance between them (ΔD) is negative.
   ANSWER: from $t = 2$ to $t = 7$

   (c) (5 points) ANSWER: Charlie is farther from Lola at $t = 9$ since the change in the distance between them from $t = 8$ to $t = 9$ (the height of the dot at $t = 8$) is 2 feet. That is, from $t = 8$ to $t = 9$, the distance between the cats increases by 2 feet.

   (d) (4 points) HINT: $D(13) - D(10)$ is the change in D from $t = 10$ to $t = 13$. The change from $t = 10$ to $t = 11$ is 1.5 feet, from $t = 11$ to $t = 12$ is 0 feet, and from $t = 12$ to $t = 13$ is 0 feet.
   ANSWER: 0.5

3. (a) (5 points) TRANSLATION: There are more cars in the lot at $t = 6$ than at $t = 7$.
   This is FALSE.

   (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: $t \approx 8.2$

   (c) (4 points) ANSWER: any one-hour interval between about 5 and 8 is acceptable

   (d) (4 points) ANSWER: approximately 520 cars per hour