Math 120 A - Spring 2008
Mid-Term Exam Number One
April 24, 2008
Answers

Version A (in problem 1, you start 12 km East, 8 km North)

1. 3.12276 hours

2. $$D(t) = \begin{cases} 5t & \text{if } 0 \le t \le 40, \\ \sqrt{200^2 + (4(t-40))^2} & \text{if } 40 \le t \le 70, \\ \sqrt{120^2 + (200 - 3(t-70))^2} & \text{if } 70 \le t \le 170 \end{cases}$$

3. $\dfrac{5000}{17} = 294.1176...$ square feet

4. (a) $$f(g(x)) = \begin{cases} -1 - x & \text{if } x \le 3, \\ 5 - 3x & \text{if } x > 3 \end{cases}$$

   (b) $x = -2$ is the only solution.

Version B (in problem 1, you start 14 km East, 6 km North)

1. 2.178498 hours

2. $$D(t) = \begin{cases} 4t & \text{if } 0 \le t \le 40, \\ \sqrt{160^2 + (6(t-40))^2} & \text{if } 40 \le t \le 60, \\ \sqrt{120^2 + (160 - 5(t-60))^2} & \text{if } 60 \le t \le 140 \end{cases}$$

3. $\dfrac{12800}{17} = 752.941...$ square feet

4. (a) $$f(g(x)) = \begin{cases} 1 - x & \text{if } x \le 3 \\ 7 - 3x & \text{if } x > 3 \end{cases}$$

   (b) $x = 2$ is the only solution.