

Math 120 C - Autumn 2010
Mid-Term Exam Number One
October 21, 2010
Answers

There were two versions of the exam.

Version A - In problem 1, Arb is 10 km NORTH of Ott.

1. 9.90615 km

2. (a) $x = -5 + 3t, y = 3 - 2t$ (b) $t = 2.164725$ and $t = 1.06604$ seconds.

3.

$$A(x) = \begin{cases} 4t & \text{if } 0 \leq t \leq 1 \\ \frac{\sqrt{25(t-1)^2 + 16t^2}}{\sqrt{25(t-1)^2 + (12 + 3(t-3))^2}} & \text{if } 1 \leq t \leq 3 \\ \sqrt{25(t-1)^2 + (12 + 3(t-3))^2} & \text{if } 3 \leq t \end{cases}$$

4. (a) $f(x) = -2x^2 - 20x - 53$ (b) $4x + 6r + 20$

Version B - In problem 1, Arb is 14 km EAST of Ott.

1. 10.48045 km

2. (a) $x = -2 + 2t, y = -6 + 4t$ (b) $t = 0.75968$ and $t = 2.04031$ seconds

3.

$$A(x) = \begin{cases} 3t & \text{if } 0 \leq t \leq 2, \\ \frac{\sqrt{9t^2 + 16(t-2)^2}}{\sqrt{(12 + 5(t-4))^2 + 16(t-2)^2}} & \text{if } 2 \leq t \leq 4. \\ \sqrt{(12 + 5(t-4))^2 + 16(t-2)^2} & \text{if } 4 \leq t \end{cases}$$

4. (a) $f(x) = 3x^2 - 6x + 7$ (b) $-6x - 9r + 6$