Math 124 H Autumn 2017
Mid-Term Exam Number Two
November 21, 2017
Answers

There were two versions, A and B.

Version A: The sphere's radius is 10 meters.

1. -1.06 m^2/sec
2. -0.159375 meters/second
3. The absolute maximum is $0.384901..$ and the absolute minimum is $0.2629818...$
4. (a) $l(x) = (\sec^5 4.5 - 1)(x - 4.5) + \tan 4.5 - 4.5 = 21.504848..(x - 4.5) + 0.137332$ (b) 4.4936139...
5. There is only one point: $(\frac{2}{5}, \frac{5}{4})$.
6. (a) $x = -\frac{3}{2} + \frac{3}{2}\ln\frac{3}{2}$ (b) Yes, $y = \frac{1}{2} - \frac{1}{2}\ln\frac{1}{4}$ (c) No: $t = 0$ and $t = -1$ are the only places where dy/dx is undefined, but t is restricted to $t > 0$.

Version B: The sphere's radius is 7 meters.

1. $-1.3428..$ m^2/sec
2. -0.246 m/sec
3. The absolute maximum is $0.58235..$ and the absolute minimum is $0.34606...$
4. (a)$l(x) = (\sec(-2)\tan(-2) - 1)(x + 2) + \sec(-2) + 2$ (b) -2.064473
5. There is only one point: $\left(1, \frac{1}{2}\right)$
6. (a)$x = \frac{2}{5}(-18 + \frac{1}{2}\ln 6) + 6 + \ln 6 = 0.950111..$. (b) No: $t = 0$ and $t = -1$ are the only places where dy/dx is undefined, but t is restricted to $t > 0$. (c) Yes, $y = \frac{1}{2} - \frac{1}{2}\ln 6$.