

MAT 21B, Winter 2023
Homework 7

Due before 2:00pm on Wednesday, March 15

Please write the homework solutions in connected sentences and explain your work. Mark the answers to each question. Scan or take pictures of your homework and upload it to Gradescope before due time.

Compute the following integrals:

1. Find the area enclosed by the x -axis and the curve $x = 1 + e^{-t}, y = t - t^2$
2. A curve is given by parametrization $x = \sin(2t), y = \sin(3t), 0 \leq t \leq 2\pi$. Find all points (x, y) where the the tangent line is horizontal.
3. The **cardioid** is given by the equation $r = -1 + \cos(\theta)$ in polar coordinates. Find the equation of the tangent line at $\phi = \pi/2$.
4. The **logarithmic spiral** is given by the equation $r = e^\theta$ in polar coordinates. Find the equation of the tangent line at $\phi = \pi$.