PRACTICE EXAM 1 - MATH 152 DATE: Tuesday, September 21 INSTRUCTOR: George Voutsadakis

Read each problem very carefully before starting to solve it. Each question is worth 3 points. It is necessary to show your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

- 1. Find the equation of the tangent line to the graph of the function $f(x) = x \ln x$ at x = e.
- 2. Compute the definite integral

$$\int_{\sqrt{\pi}/2}^{\sqrt{\pi}} 3x \cos{(x^2)} dx.$$

- 3. Sketch the region enclosed by the two curves $y = e^x$ and $y = e^{2x}$ from x = 0 to $x = \ln 2$ and find its area.
- 4. Find the volume of the solid that results when the region enclosed by the curves $x = y^2$, x = y + 2 is revolved around the y-axis.
- 5. Find the exact length of the parametric curve

$$x = e^t \cos t, \quad y = e^t \sin t, \quad 0 \le t \le \frac{\pi}{2},$$

without eliminating the parameter.

6. Find the area of the surface generated by revolving the curve

$$x = 2\sqrt{1-y}, \quad -1 \le y \le 0,$$

around the y-axis.