

Math152 - Calculus II - Winter 2005

Mid-Term TEST #1, January 20, 2005

In the following problems you are required to show all your work and provide the necessary explanations everywhere to get the full credit.

1. Find the following integrals:

$$(a) \int \sin^3 x \cos x \, dx$$

$$(b) \int \frac{x \, dx}{\sqrt{2x^2 + 5}}$$

$$(c) \int_0^{\sqrt{\pi}} x \cos(x^2) \, dx$$

$$(d) \int_1^e \ln^2 x \, dx$$

2. Sketch the region enclosed by the curves

$$x = \frac{2}{y}, \quad x = 0, \quad y = 1, \quad y = e$$

and find its area.

3. Find the exact arc length of the following parametric curve

$$x = e^{2t}(\cos 2t - \sin 2t), \quad y = e^{2t}(\sin 2t + \cos 2t) \quad (0 \leq t \leq 1).$$