Calculus, Fall 2003

Quiz 5

Dec 16 2003, 11:10 AM - 12:00 AM
Show all details.

(1) Given the line segment $L = \{(x, y) | \, y = e^{-x} - e^{-1}, 0 \leq x \leq 1\}$. Find the formulas for the following quantities (need not find the numerical values of the integrals).

(a) The arclength of L.
(b) The volume of revolution obtained by evolving L around x axis.
(c) The surface area of revolution obtained by evolving L around x axis.
(d) The volume of revolution obtained by evolving L around y axis.
(e) The surface area of revolution obtained by evolving L around y axis.

(2) Find the the following integrals:

(a) $\displaystyle\int \frac{dx}{\sqrt{-x^2 - 2x + 2}}$ (b) $\displaystyle\int \frac{dx}{x\sqrt{2 - \ln^2 x}}$ (c) $\displaystyle\int \frac{\sin x \, dx}{\sqrt{1 + \cos x}}$

(d) $\displaystyle\int \frac{d\theta}{\sec\theta + 2\tan\theta}$ (e) $\displaystyle\int_0^{\pi/2} \sqrt{1 + \cos t} \, dt$

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