

King Fahd University of Petroleum and Minerals  
Department of Mathematical Sciences  
**MATH 102 (Section 1)**  
Exam I  
Semester I, 2004–2005(041)  
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Name: \_\_\_\_\_

ID #: \_\_\_\_\_ Sec. #: \_\_\_\_\_

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Q1. Sketch the region  $R$  bounded by the graphs of the equations  $y = 2x$  and  $y = 4x^2$  and find the volume of the solid generated when  $R$  is revolved about the  $y$ -axis.

Q2. Using the left endpoint of each subinterval, find the area under the graph of  $f(x) = x^3 + 1$  on the interval  $[0, 2]$ .

Q3. Evaluate the following integrals:

$$(a) \int_1^2 \frac{dx}{x^2 - 6x + 9}.$$

$$(b) \int \left(1 + \frac{1}{x}\right)^2 \frac{dx}{x^2}.$$

Q4. Sketch the region bounded by the graphs of the equations

$$y^2 = -x, \quad x - y = 4, \quad y = -1 \quad \text{and} \quad y = 2$$

and find its area.

Q5. A function  $f(x)$  is even if  $f(-x) = f(x)$ . Show that if  $f(x)$  is even then

$$\int_{-a}^a f(x)dx = 2 \int_0^a f(x)dx.$$