Prince Sultan University

Department of Mathematical Sciences

MATH 113 – second Examination

16 December 2008

Time allowed: 45 minutes — Dr. Bahaa Eldin Abdalla

Maximum points: 30 points

1. (10 points) Evaluate each integral.

   (a) $\int \frac{\sin\left(\ln x^3\right)}{x} dx$

   (b) $\int \frac{5^x + 1}{5^x} dx$

2. (5 points) Find the area of the surface that is generated by revolving the portion of the curve $x = 9y + 1$ between $y = 0$ and $y = 2$ about the *y*-axis.

3. (5 points) Prove that the area bounded by the graphs of $y = x^2$, $y = 2 - x$ and $y = 0$ is $5/6$ square units.

4. (5 points) Find the volume of the solid resulting from revolving the region bounded by the curves $y = 4 - x^2$ and $y = 1$ from $x = 0$ to $x = \sqrt{3}$ about the *y*-axis..

5. (5 points) Use cylindrical shells to find the volume of the solid formed by revolving the region bounded by the graph of $y = x^2$ and $y = 2 - x^2$ about the line $x = -2$.