Prince Sultan University, Department of Mathematics, 6/11/10.

Calculus II (Math 113), Mid-Term 2- Fall (101).

Dr Abdul-Wahed HAMDI Duration : 90 min

– Answer all the questions.
– This exam consists of a total of 4 pages and 5 questions.
– Show your working in the space provided for each question.
– Show all the key steps of your work.
– Scientific, non-programmable calculators are allowed.

Question	Maximum Score	Your Score
1	12	
2	12	
3	5	
4	5	
5	16	
Total	50	

Name	
ID Number	

1. Determine $\dfrac{dy}{dx}$

(a) $y = \dfrac{x^2}{1 + \log_2(x)}$

(b) $y = \dfrac{\sin(x)\tan^2(x)\cos(x)}{\sqrt{2-x}}$

(c) $y = \log_x(2)$.

(d) $y = [\sin(2x)]^{2x^3-2x}$

2. Evaluate the following definite integrals

(a) $\displaystyle\int_{e^{-3}}^{e^3} \frac{\sqrt{9-(\ln(x))^2}}{x}dx$

(b) $\int_{-1}^{1} \sqrt{e^{3x}}dx$

(c) $\int_{-1}^{1} \dfrac{e^{-2x}+e^{2x}}{e^{-2x}-e^{2x}}dx.$

3. Find the exact arc length of the curve $x = (y^2+2)^{3/2}$ from $y = 0$ to $y = 1$.

4. Determine the surface area of the solid obtained by revolving $y = \sqrt{4 - x^2},\ x \in [-1,\ 1]$ about the x-axis.

5. Setup the integral giving the volume by two methods (Cylindrical Shells and Washers) of the solid generated by revolving the region bounded by :

(a) $y = 0,\ \ y = \sqrt{x+1},\ \ x = 8$ about the line $x = -3$
(b) $y = x^2 - 5x + 4$ and the x-axis about the line $y = -4$