

University of Bahrain
Department of Mathematics
MATHS122: Calculus II
Spring 2016
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Test 1

Student's Name: _____ ID: _____

Section: _____ Serial Number: _____

- *Do not* open the exam until you are instructed to do so.
- Show sufficient work to justify each answer.
- Calculators are allowed but cell phones are *not* allowed during the exam.
- Exchange of any material such as calculator, pen, eraser is *not* allowed.
- **No** questions are allowed.
- You have 1 hour to finish this exam. You can leave only after 30 minutes of the exam.
- There are 3 questions and 5 pages in this exam.

Question	Points	Score
1	6	
2	4	
3	10	
Total:	20	

Question 1 (6 points)

Consider the region enclosed by the curves $y = \sqrt{x}$, $y = 1$, and $x = 0$.

(a) Sketch the region above.

(b) Find the volume of the solid generated by revolving the region about the line $x = 4$.

Question 2 (4 points)

Find the length of the curve

$$y = 24x^{\frac{3}{2}}, \quad 0 \leq x \leq 2$$

Question 3 (10 points)

(i) Use l'hospital's rule to find the following limits:

(a) $\lim_{x \rightarrow 0} \frac{\sin x - x}{x^3}$

(b) $\lim_{x \rightarrow 0^+} x (\ln x)^2$

(ii) Evaluate the following integrals:

(a) $\int (6x + 5) \cos x \, dx$

(b) $\int_1^e 25x^4 \ln x \, dx$