

King Saud University
Department of Mathematics

106
Second Midterm, December 2016

NAME:

Group Number/Instructor name:

ID:

- Duration of the exam: 90 minutes
- Simple calculators are allowed

Question	Grade
I	
II	
III	
IV	
Total	

I) [5 marks]

A) Sketch the graphs of functions $y = 2x - 4$, $y = -x + 5$ and $y = -2$ on the same system of coordinates and shade the region R , enclosed by the graphs of the three functions.

B) Find the area of the region R .

II) [5 marks]

A) Sketch the graph of the region R determined, in the plane, by the graphs of $y = x^2$ and $y = 2 - x$.

B) Find the volume of the solid obtained by revolving the region R about the x -axis.

III) [5 marks]

A) Compute the arc length of the graph of $y = \frac{x^3}{12} + \frac{1}{x}$, from $(1, \frac{13}{12})$ to $(2, \frac{7}{6})$.

B) The graph of $y = 2\sqrt{x+1}$, from $(0, 2)$ to $(3, 4)$, is revolved about the x -axis. Find the area of the resulting surface.

V) [5 marks]

A) Use logarithmic differentiation to compute $\frac{dy}{dx}$, if $y = \frac{x^2\sqrt{6x-2}}{(x+3)^3}$.

B) Use implicit differentiation to compute y' , if $xe^y + 4y^2 + x + \ln(y^2) = 4$.

Scrap paper. This will not be graded.