



*Kingdom of Saudi Arabia*  
*King Abdulaziz University*

**Faculty of Science --Mathematics Department**  
**First Mid-Term Exam (90 Minutes) - (Math 204).**

**21/4/1434 H – 3/3/2013 A.D.**

**Second Semester**

**1433-1434 H**

**Model: B**

<b>Name:</b>	<b>Section:</b>
<b>Student's I.N. :</b>	<b>Serial Number:</b>

$Q_1$	$Q_2$	$Q_3$	$Q_4$	$Q_5$	<b>Total Marks (25)</b>

**(Answer the following questions)**

- 1 Prove that the I.V.P.  $\frac{dy}{dx} = \sqrt{xy}$ ,  $y(2) = 1$  has unique solution.

[5 Marks]

2 Solve the differential equation:

[5 Marks]

$$(2y^2 + 3x)dx + 2xy dy = 0$$

3 Solve the differential equation:

[5 Marks]

$$\frac{dy}{dx} = \frac{x^2 + y^2}{xy - x^2}$$

4 Solve the differential equation:

[5 Marks]

$$\frac{dy}{dx} = \tan^2(x + y)$$

5. The population of a community is known to increase at a rate proportional to the number of people present at time  $t$ . If an initial population  $P_0$  has doubled in 5 years, how long will it take to triple? [5 Marks]