

**King Fahd University of Petroleum and Minerals**  
**Department of Math & Stat**  
**Math 201 Section # 1, 9 (082)**  
**Quiz 1(a)**

Time: 20 minutes

Marks: \_\_\_\_\_/10

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Name: \_\_\_\_\_ Section #: \_\_\_\_\_

ID #: \_\_\_\_\_ Serial #: \_\_\_\_\_

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1. Draw the graph of equation  $r = 3 \sin 2\theta$ . (Give all necessary details).

2. For the parametric curve  $x = t^2$ ,  $y = t^3 - 3t$ , find  $\frac{d^2y}{dx^2}$ . Where is this curve concave upward?

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**Quiz 1(b)**

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Name: \_\_\_\_\_ Section #: \_\_\_\_\_

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1. Describe the motion of the particle with position  $(x, y)$  where  $x = 2 + \cos t$ ,  
 $y = 3 + \sin t$  and  $0 \leq t \leq 2\pi$ .

2. Calculate length of the curve:  $x = e^t \sin t$ ,  $y = e^t \cos t$  ( $0 \leq t \leq \pi$ ).

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**Quiz 1(c)**

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1. The position of two particles is given by:

$$x_1 = 3 \sin t, y_1 = 2 \cos t \quad (0 \leq t \leq 2\pi)$$

$$x_2 = 3 + \cos t, y_2 = 1 + \sin t \quad (0 \leq t \leq 2\pi)$$

Check whether or not the particles will collide.

2. Test the curve  $r = 2 \cos 2\theta$  for symmetry about  $x$ -axis,  $y$ -axis and the origin.

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1. Draw the curve  $2r = \cos \theta$ . Write domain of  $\theta$  in this case.

2. Set up integral to find area bounded by the curve  $x = \cos t$ ,  $y = e^t$   $\left(0 \leq t \leq \frac{\pi}{2}\right)$  and the lines  $y = 1$  and  $x = 0$ .