

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

DEPARTMENT OF MATHEMATICS & STATISTICS

MATH201 – Section 02 (Term 161)

Date: October 6, 2016

Quiz 1

Duration: 30 minutes

Family Name: _____ **ID #:** _____ **Serial #:** _____

1. Consider the parametric curve, C , described by the parametric equations:

$$C: \quad x = e^t + e^{-t}, \quad y = 5 - 2t, \quad 0 \leq t \leq 3$$

(a) Find the slope of the tangent line that corresponding to $t = \ln 2$.

(b) Find the length of the curve C .

(c) Eliminate the parameter t to find a Cartesian equation for the curve C .

(3 + 4 + 3 = 10 points)

2. Consider the polar equations:

$$r = 2, \quad r = 4 \cos \theta, \quad 0 \leq \theta \leq 2\pi$$

(a) Find the intersection points between these two polar curves.

(b) Sketch these curves and highlight the region **R** that enclosed between them.

(c) Find the area of the region **R**.

(2 + 4 + 4 = 10 points)

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DEPARTMENT OF MATHEMATICS & STATISTICS

MATH201 – Section 07 (Term 161)

Date: October 6, 2016

Quiz 1

Duration: 30 minutes

Family Name: _____ **ID #:** _____ **Serial #:** ____

1. Consider the parametric curve described by the parametric equations:

$$C: \quad x = 3t - t^3, \quad y = 3t^2, \quad 0 \leq t \leq 1$$

(a) Find the slope of the tangent line that corresponding to $t = 1/2$.

(b) Find the surface area generated by revolving the curve C about the $x -$ axis.

(c) Sketch the curve C and indicate the direction (with an arrow) in which the curve is traced as t increases, as well as the initial and terminal points.

(3 + 4 + 3 = 10 points)

2. Consider the polar curve described by the polar equation:

$$r = 2 + 2 \cos \theta$$

(a) What type of symmetry is applicable to this polar curve and why?

(b) Find the length of the polar curve for $0 \leq \theta \leq \pi$.

(c) Find the points at which the tangent is horizontal.

(2 + 4 + 4 = 10 points)