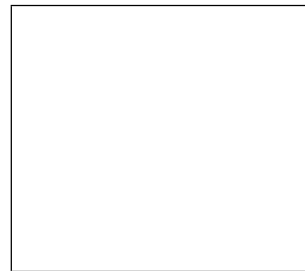


Calculus Homework Assignment 1

Class: _____

Student Number: _____

Name: _____



1. $x = 3 \cos \theta$, $y = 4 \sin \theta$, $-\pi/2 \leq \theta \leq \pi/2$.

a. Eliminate the parameter to find a Cartesian equation of the curve.

b. Sketch the curve and indicate with an arrow the direction in which the curve is traced as the parameter increases. [like §11.1 #12]

3. Find an equation of the tangent to the curve

$$x = 1 + \ln t, \quad y = t^2 + 2$$

at $(1, 3)$ by two methods:

a. without eliminating the parameter and

b. by first eliminating the parameter.

[§11.2 #7]

2. Find parametric equations for the path of a particle that moves along the circle

$$x^2 + (y - 1)^2 = 4$$

in the manner described.

a. Once around clockwise, starting at $(2, 1)$

b. Three times around counterclockwise, starting at $(2, 1)$

c. Halfway around counterclockwise, starting at $(0, 3)$ [§11.1 #33]

4. Find the area enclosed by the x -axis and the curve $x = 1 + e^t$, $y = t - t^2$. [§11.2 #33]

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5. Find the exact length of the curve.

$$x = 3 \cos t - \cos 3t, y = 3 \sin t - \sin 3t, 0 \leq t \leq \pi$$

[§11.2 #44]

7. Sketch the curve with the given polar equation.

$$r = 1 - 2 \sin \theta$$

[§11.3 #41]

6.

a. Find a Cartesian equation for the curve

$$r = 2 \sin \theta.$$

b. Find a polar equation for the curve

$$xy = 4.$$

[like §11.3 #17,26]

8. Find the points on the curve

$$r = 2 \cos \theta$$

where the tangent line is horizontal or vertical.

[like §11.3 #63]