

Chapter 10 Test

- 1) For the following parametric Function find the equation of the tangent line at $t = 1$ and find the points at which the function has vertical and horizontal tangents.

$$x = t^2 - 3t \quad y = t^3 - 4t$$

- 2) Use the parametric equations of an ellipse $x = 2 \cos \theta$ $y = 3 \sin \theta$, $0 \leq \theta \leq 2\pi$ to find the area that it encloses

3) Find the length of the following curve

$$x = 2 \cos^2 t \quad y = 2 \sin t \cos t \quad 0 \leq t \leq 1$$

4) Find the surface area of the following curve rotated around the x-axis

$$x = 2t^2 + \frac{1}{t} \quad y = 8\sqrt{t} \quad 1 \leq t \leq 3$$

- 5) Find the slope of the tangent line at the give θ and also find the values of θ that give a vertical or horizontal tangent.

$$r = 2 \sin 2\theta \quad \theta = \pi/3$$

6) Find the area of the enclosed curve

$$r = 2 + \cos 4\theta$$

7) Find the length of the polar curve

$$r = \theta^2 \quad 0 \leq \theta \leq 2\pi$$