

CALCULUS 1501 WINTER 2012

HOMEWORK ASSIGNMENT 7.

Due April 11.

- 7.1. Find the Cartesian equation of the curve which is given by a parametric equation

$$x = 2 \cos \theta, \quad y = 3 \sin \theta, \quad \theta \in (-\pi, \pi).$$

Sketch the curve indicating with an arrow the direction in which the curve is traced as the parameter increases.

- 7.2. Find the equation of the tangent line to the parametric curve given by

$$\begin{cases} x = 3t^2 + 1 \\ y = 2t^3 + 1, \end{cases}$$

that passes through the point $(4, 3)$.

- 7.3. Find the length of the loop of the curve

$$x = 3t - t^3, \quad y = 3t^2.$$

- 7.4. Find the points on the curve given in polar coordinates by

$$r^2 = \sin 2\theta$$

where the tangent line is horizontal or vertical.

- 7.5. Graph the curve

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

and find the area that it encloses.

- 7.6. Find a formula for the distance between the points with polar coordinates (r_1, θ_1) and (r_2, θ_2) .