

1. Plot the graphs given by the following polar expressions. Sketch the graph yourself first and check it then with the computer.

(a)  $r(\theta) = 2$

(b)  $r(\theta) = 3 \sin(\theta)$

(c)  $r(\theta) = 4 \cos(\theta)$

(d)  $r(\theta) = \sin(2\theta)$

(e)  $r(\theta) = 2 \cos(4\theta)$

(f)  $r(\theta) = \cos(5\theta)$

2. Find the polar curve describing the following graphs. Check your answer with the computer.

(a) The circle given by  $x^2 + (y - 5)^2 = 36$ .

(b) The ellipse given by  $\frac{x^2}{49} + \frac{y^2}{64} = 1$ .

3. For each of the graphs in 2., find the slope of the tangent at the following points.

(a)  $x^2 + (y - 5)^2 = 36$

Tangent at  $(0, 11)$ :

Tangent at  $(-\sqrt{35}, 6)$ :

(b)  $\frac{x^2}{49} + \frac{y^2}{64} = 1$

Tangent at  $\left(5, \frac{16\sqrt{6}}{7}\right)$ :

Tangent at  $(7, 0)$ :