

ASSIGNMENT POLAR COORDINATES

QUESTION 1

- a) Transform the polar equation

$$r = \frac{4 \cos \theta}{\cos^2 \theta + 1}$$

into its Cartesian form and identify the curve. (5 marks)

- b) Consider the polar equation $r = 3 \sin(3\theta)$.

- i. Test the symmetries for the above polar equation. (4 marks)
- ii. Construct a table for (r, θ) by choosing appropriate values for r and θ . Hence, sketch the graph of $r = 3 \sin(3\theta)$ on the **polar grid provided in page 7**. (6 marks)
- iii. Sketch the graph of $r = 3$ on the same polar grid in part (ii). (2 marks)
- iv. Find all intersection points between $r = 3 \sin(3\theta)$ and $r = 3$. (3 marks)

QUESTION 2

Given the polar equation $r = 1 - \cos \theta$.

- (i) Test the symmetries of the above polar equation. (3 marks)
- (ii) Construct a table for (r, θ) with appropriate values and sketch the graph of $r = 1 - \cos \theta$. (**Use the polar grid provided**) (5 marks)
- (iii) Sketch the graph $\tan \theta = 1$ on the same diagram. (3 marks)
- (iv) Find the intersection points between the curves $r = 1 - \cos \theta$ and $\tan \theta = 1$. (4 marks)