Problem 1

Sketch the the set of points whose polar coordinates satisfy the given inequalities:

$$0 \leq r \leq 5 \quad 0 \leq \theta \leq 2\pi$$

$$1 \leq r \leq 2 \quad 0 \leq \theta \leq 2\pi$$

$$-1 \leq r \leq 1 \quad \pi/6 \leq \theta \leq \pi/2$$

$$0 \leq \theta \leq \pi/6 \quad \text{no restriction on } r$$

Problem 2

Graph the curve $r = 1 + \cos(\theta)$. Then, give the equation of the tangent line (in the usual Cartesian coordinates) at the point $(r, \theta) = (\frac{3}{2}, \frac{\pi}{3})$. Graph the tangent line on the graph of the curve.

Problem 3

Graph the curves $r = 1 + 2\cos(\theta)$ and $r = \sin(2\theta)$ (separately).