1 5 points

Let

$$x = t - \sin t, \quad y = 1 - \cos t.$$

(a) Find an equation for the line tangent to the curve at the point $t = \frac{3}{2}\pi$.

(b) Find the lengths of the curves where $0 \leq t \leq \pi$.

2 5 points

Consider

$$r = \theta$$

for $0 \leq \theta \leq \pi$.

(a) Find the three points of the curve at $\theta = 0, \frac{\pi}{2}, \pi$ in xy-plane, and sketch the curve.

(b) Find the area bounded by the curve and x-axis.