1 5 points

Let

$$x = \frac{3}{8}t^2, \quad y = (t+1)^{\frac{3}{2}}.$$

(a) Find an equation for the line tangent to the curve at the point $t = 3$.

(b) Find the lengths of the curves where $0 \leq t \leq 2$.

2 5 points

Consider

$$x = e^{\theta}\cos\theta, \quad y = e^{\theta}\sin\theta$$

for $0 \leq \theta \leq 2\pi$.

(a) Replace the curve with equivalent polar equations.

(b) Find the area of the fan-shaped region between the origin and the curve.