[1] Find the area under the parametrized curve

\[ x = e^t, \quad y = e^{2t}, \quad 0 \leq t \leq \ln(2). \]
Problem: _____
[2] Find the area of one petal of the polar curve

\[ r = \cos(2\theta). \]
Problem: _____
Find the surface area generating by rotating around the $x$-axis the parametrized curve

$$x = \cos(t), \quad y = \sin(t), \quad 0 \leq t \leq \pi.$$
Problem: _____
Find the arc length of the parametrized curve

\[ x = t \cos(t), \quad y = t \sin(t), \quad 0 \leq t \leq 2\pi. \]

Simplify the integral as far as possible, but do not solve it. Instead, guess its value.
Problem: _____
Find the arc length of the polar curve

\[ r = \theta, \quad 0 \leq \theta \leq 2\pi. \]

Simplify the integral as far as possible, but do not solve it. Instead, guess its value.
Problem: _____