W13 Stepwise

Due date: Thursday 4/9, 11:59pm

01

Cycloid - Arclength and surface area of revolution

Consider the cycloid given parametrically by $c(t) = (t - \sin t, 1 - \cos t)$.

(a) Find the length of one arch of the cycloid.

(b) Suppose one arch of the cycloid is revolved around the x-axis. Find the area of this surface of revolution.

02

Convert points: Cartesian to Polar

Convert the Cartesian (rectangular) coordinates for these points into polar coordinates:

(a) $(1, 0)$ (b) $(3, \sqrt{3})$ (c) $(-2, 2)$ (d) $(-1, \sqrt{3})$

03

Convert equations: Polar to Cartesian

Convert the polar equation to a Cartesian equation. Be sure to simplify.

(a) $r = 7$ (b) $r = 2\sin\theta$ (c) $r = \dfrac{1}{\cos\theta - \sin\theta}$