

W13 Regular

Due date: Sunday 4/12, 11:59pm

01

Parametric arclength

Find the arclength of the curve given parametrically by $x = 2t^2$, $y = 3t^2 - 1$ over the time interval $0 \leq t \leq 4$.

✍ Minimum speed of a particle

Suppose a travelling particle has position modelled by the parametric curve:

$$c(t) = (t^3 - 4t, t^2 + 1)$$

What is the *slowest speed* of the particle?

✍ Convert points: Polar to Cartesian

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

- (a) $(3, \frac{\pi}{6})$ (b) $(-6, \frac{3\pi}{4})$ (c) $(0, \frac{\pi}{5})$ (d) $(5, -\frac{\pi}{2})$

✍ Convert equations: Cartesian to Polar

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

(a) $x^2 + y^2 = 25$ (b) $x = 5$ (c) $y = x^2$