

Problem 1.25

Spiraling particle

A particle moves outward along a spiral. Its trajectory is given by $r = A\theta$, where A is a constant. $A = (1/\pi)$ m/rad. θ increases in time according to $\theta = \alpha t^2/2$, where α is a constant.

- (a) Sketch the motion, and indicate the approximate velocity and acceleration at a few points.
- (b) Show that the radial acceleration is zero when $\theta = 1/\sqrt{2}$ rad.
- (c) At what angles do the radial and tangential accelerations have equal magnitude?