

FE Curvilinear Coordinate Problem
Engineering Dynamics, Fall 2013

1. A moving body has a path length described by the equation, $s = 20t + 2t^2 - 3t^3$.

What is the particle's initial velocity?

What is the acceleration of the particle at time $t = 0$? (magnitude only)

What is the maximum speed reached by the particle?

2. A particle has a tangential acceleration of $a_t = 2t - \sin t + 3 \cot t$ $\left[\text{in } \frac{m}{s^2} \right]$ when it moves around a point in a curve with instantaneous radius of 1 m. What is the instantaneous angular velocity (in rad/s) of the particle?