

Homework H.1.B

Given: Particle P moves in the xy -plane in such a way that the position vector of P as measured from the origin O is given as a function of time as: $\vec{r}_P = \left(-\frac{1}{6}t^3 + \frac{1}{2}t^2\right)\hat{i} + \frac{1}{12}t^4\hat{j}$, with the position vector components given in terms of meters and time t given in seconds.

Find: For this problem:

- At $t = 1\text{ s}$, determine the velocity \vec{v}_P and acceleration \vec{a}_P vectors in terms of the \hat{i} and \hat{j} Cartesian unit vectors, as well as the angles β and γ as measured from the direction of the positive x -axis.
- Repeat Part (a) above for $t = 4\text{ s}$.

