

A particle of mass m is moving in such a way that its position at time t is given by $(t^3 - 3t, 4t^2, 5t)$ relative to a Cartesian coordinate system.

- (i) Find the external force acting on the particle.
- (ii) Find the angular momentum of the particle about the origin.
- (iii) Verify that the torque law holds for the angular momentum about the origin.