PHYS 211 Sample Test Question on using Vector cross product

1. Write down torque as s vector cross product.

2. Write down angular momentum of a particle, as a vector cross product.

3. At time *t*, $\vec{r}=2t^{2}\hat{i}-3t^{3}\hat{j}$ gives the position of a 2.0 kg particle relative to the origin of an *xy* coordinate system ( is in meters and *t* is in seconds).
I. Find an expression as a function of time for a) the velocity b) the acceleration c) the force, of the particle relative to the origin.
II. About the origin, at t = 1s, determine d) the torque and e) the angular momentum of the particle in unit–vector notation.