

Show all work. 5 points each.

1. Find the equation of the normal plane for $\mathbf{r}(t) = \langle t, t^2, t^3 \rangle$ at the point $(1, 1, 1)$, i.e. $t = 1$.

2. Find the velocity and position vectors of a particle that has the given acceleration and the given initial velocity and position.

$$\mathbf{a}(t) = \langle 1, 2, 0 \rangle \quad \mathbf{v}(0) = \langle 0, 0, 1 \rangle \quad \mathbf{r}(0) = \langle 1, 0, 0 \rangle$$