

For each of the two vector functions given below, find the velocity, and write down the equation of the tangent line corresponding to the initial value of parameter $t=t_0$. Then, sketch the trajectory over the given interval of t , and sketch the tangent line on the same plot

$$\text{a) } \mathbf{r}(t) = \left\langle \frac{\cos t}{\sqrt{t}}, 1 - \frac{1 - \sin^2 t}{t} \right\rangle, t \in \left[\frac{\pi}{2}, \pi \right] \quad (t_0 = \pi/2)$$

$$\text{b) } \mathbf{r}(t) = \langle \cos(2t), t \sin(2t) \rangle, t \in [0, 2\pi] \quad (t_0 = 0)$$