

■ Let  $r(t) = t^3\mathbf{i} + \sqrt{t+2}\mathbf{j} + \frac{\sin t}{t}\mathbf{k}$  , for  $t \neq 0$  . Find the limit

$$\lim_{t \rightarrow 0} r(t) = \underline{\hspace{2cm}} .$$

■ Ans :  $(0, \sqrt{2}, 1)$

Sol :

$$r(t) = (t^3, \sqrt{t+2}, \frac{\sin t}{t}), \forall t \neq 0.$$

$$\lim_{t \rightarrow 0} r(t) = (\lim_{t \rightarrow 0} t^3, \lim_{t \rightarrow 0} \sqrt{t+2}, \lim_{t \rightarrow 0} \frac{\sin t}{t}) = (0, \sqrt{2}, 1)$$