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Lecture - 4 Quiz

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$$1) \quad x = \cos(t) \quad y = \sin(t) \quad z = t^2 + 1 \quad ; \quad (1, 0, 1)$$

- Find the parametric equation for the tangent line to the curve with the given parametric equation at the specific point.

$$\cos t = 1$$

$$\sin t = 0$$

$$t^2 + 1 = 1$$

$$t = 0$$

$$t_0 = 0$$

$$\langle x'(t), y'(t), z'(t) \rangle$$

$$r'(t) = \langle -\sin t, \cos t, 2t \rangle$$

$$r'(0) = \langle 0, 1, 0 \rangle$$

$$\langle 1, 0, 1 \rangle + t \langle 0, 1, 0 \rangle = \langle 1, t, 1 \rangle$$

$$2) \quad \text{r}'(t) = i(t) + 2j + k(t+1)$$

$$r(0) = i + 2j + 3k$$

$$\int r'(t) dt = \left[(i)t + r(2j) + tk + k \right] dt$$

$$i + 2j + 3k = \frac{t^2}{2} i + 2jt + \frac{t^2}{2} k + kt + C$$

$$i + 2j + 3k = C$$

$$r(t) = \left(\frac{t^2}{2} + 1 \right) i + 2j(t+1) + k \left(\frac{t^2}{2} + t + 3 \right)$$