

SHUBIN XIE RUID: 203002353. section 22

$$\begin{array}{lll} 1. \cos t = 1 & \sin t = 0 & t^2 = 1 \\ t=0 & t=0 & t=0 \end{array}$$

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

$$\text{direction } r'(0) = \langle 0, 1, 0 \rangle$$

$$\begin{aligned} \text{line tangent: } & \langle 1, 0, 1 \rangle + t \langle 0, 1, 0 \rangle \\ & = \langle 1, t, 1 \rangle \end{aligned}$$

$$x(t) = 1 \quad y(t) = t \quad z(t) = 1$$

2.

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

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

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

