

$$\langle 2, -1, 1 \rangle \cdot \langle 1, 3, -1 \rangle = |A| |B| \cos \theta$$

$$2 - 3 - 1 = \sqrt{6} \sqrt{11} \cos \theta$$

$$\theta = 104.3^\circ \quad \frac{-2}{\sqrt{66}} = \cos \theta$$

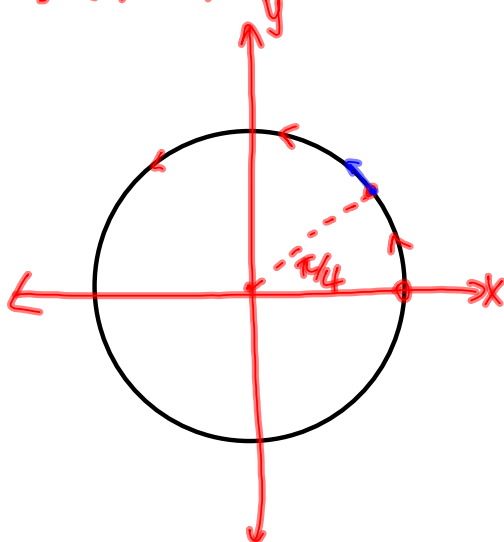
$$r(t) = \langle \cos t, \sin t \rangle$$

$$\frac{dr}{dt} = r'(t) = \langle -\sin t, \cos t \rangle$$

tangent

$$\frac{d^2r}{dt^2} = r''(t) = \langle -\cos t, -\sin t \rangle$$

$$f^2(x) = f(f(x))$$



$$r(t) = \langle t, 2t^2, e^t \rangle$$

Find eq. of tangent line at $t=0$.

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

$$r(t) = \langle 0, 0, 1 \rangle + t \langle 1, 0, 1 \rangle$$

$$r'(t) = \langle 1, 4t, e^t \rangle$$

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

$$T(t) = \frac{r'(t)}{|r'(t)|}$$

Find $T(t)$, unit tangent vector.

$$T(t) = \frac{r'(t)}{|r'(t)|} = \frac{\langle 1, 4t, e^t \rangle}{\sqrt{1 + 16t^2 + e^{2t}}}$$