

203 §13.3 #26, 47, 48

26) Graph curve w/ parametrizations

$$\langle x = \cos t, y = \sin t, z = \sin 5t \rangle$$

Then find curvature @ $(1, 0, 0)$

$$\vec{r} = \langle \cos t, \sin t, \sin(5t) \rangle$$

$$\vec{r}' = \langle -\sin t, \cos t, 5\cos(5t) \rangle$$

$$\vec{r}'' = \langle -\cos t, -\sin t, -25\sin(5t) \rangle$$

~~at~~ $(1, 0, 0) \rightsquigarrow t=0$

$$\vec{r}'(0) = \langle 0, 1, 5 \rangle$$

$$\times \vec{r}''(0) = \langle -1, 0, 0 \rangle$$

$$\langle 0, -5, 1 \rangle$$

$$\|\vec{r}'(0)\| = \sqrt{26}$$

$$\|\vec{r}'(0) \times \vec{r}''(0)\| = \sqrt{26}$$

$$\kappa = \frac{\|\vec{r}'(0) \times \vec{r}''(0)\|}{\|\vec{r}'(0)\|^3}$$

\Rightarrow

$$= \frac{\sqrt{26}}{(\sqrt{26})^3}$$

$$= \frac{1}{26} = \kappa$$