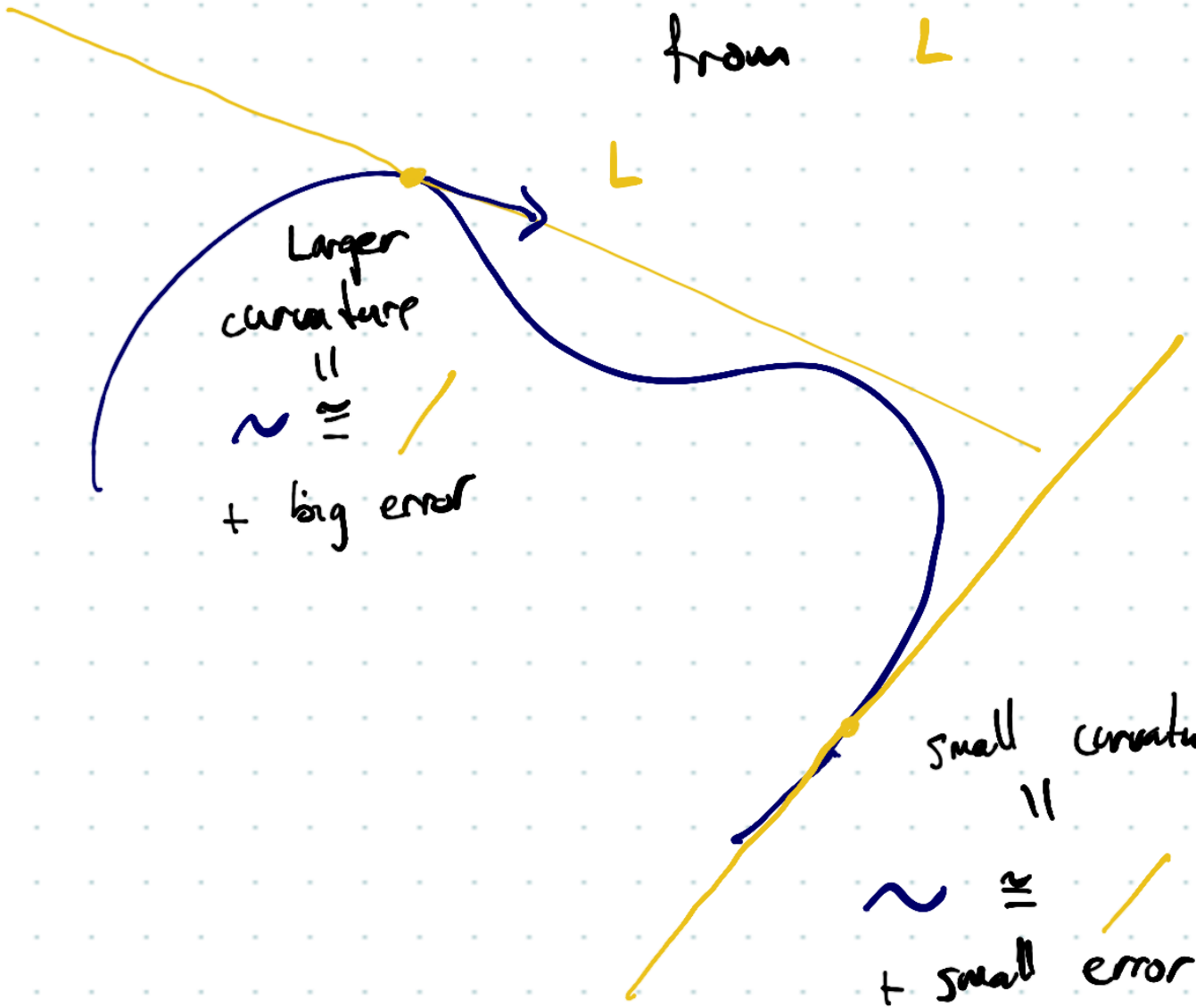
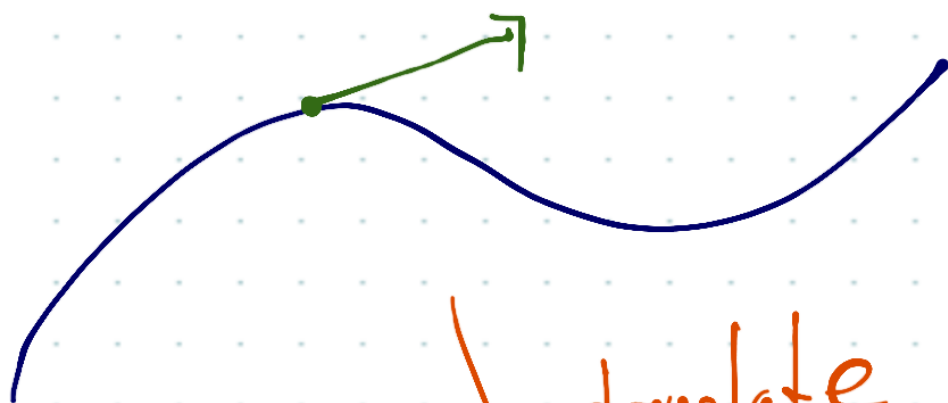


K measures deviation from L

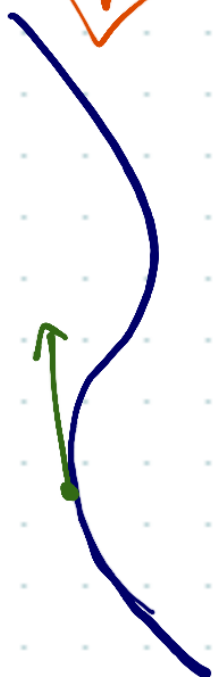




translate



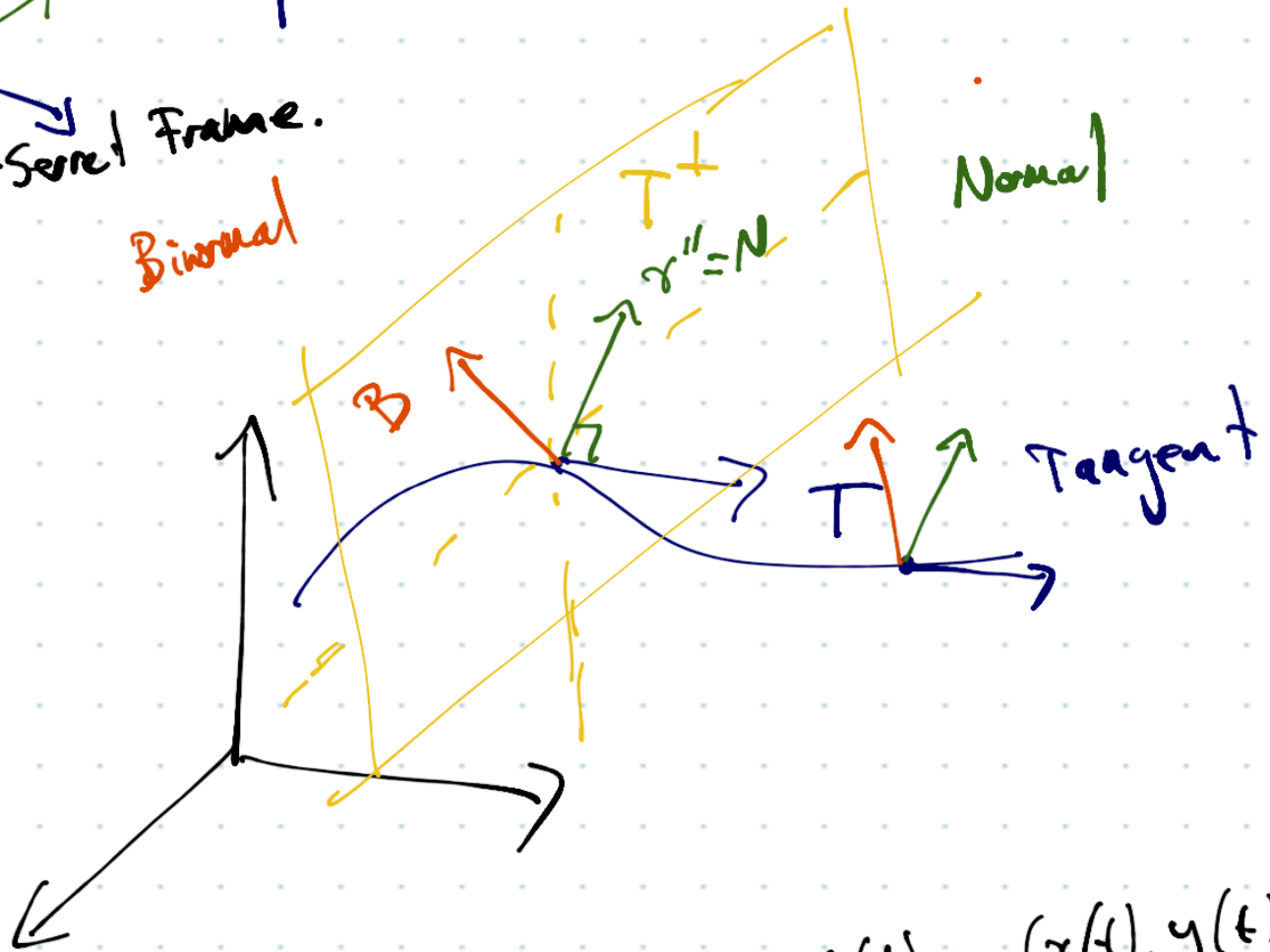
rotate



Space Curves

Frenet-Serret Frame.

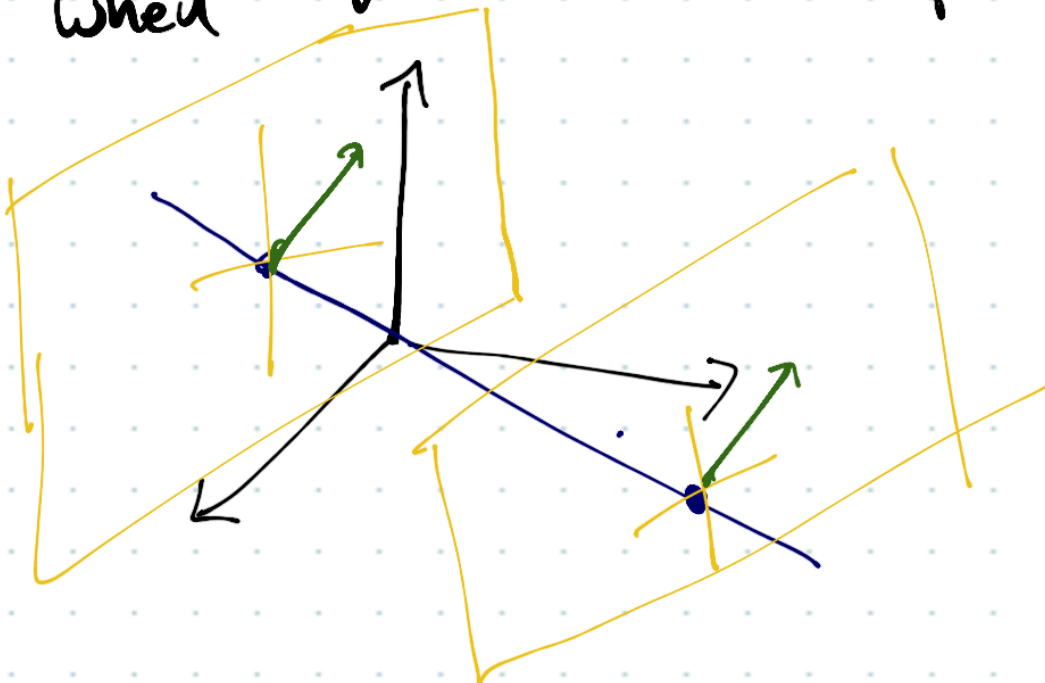
Binormal



$$\gamma(t) = (x(t), y(t))$$

$$\gamma'' = (x'', y'')$$

When $\gamma'' = 0$



Note:

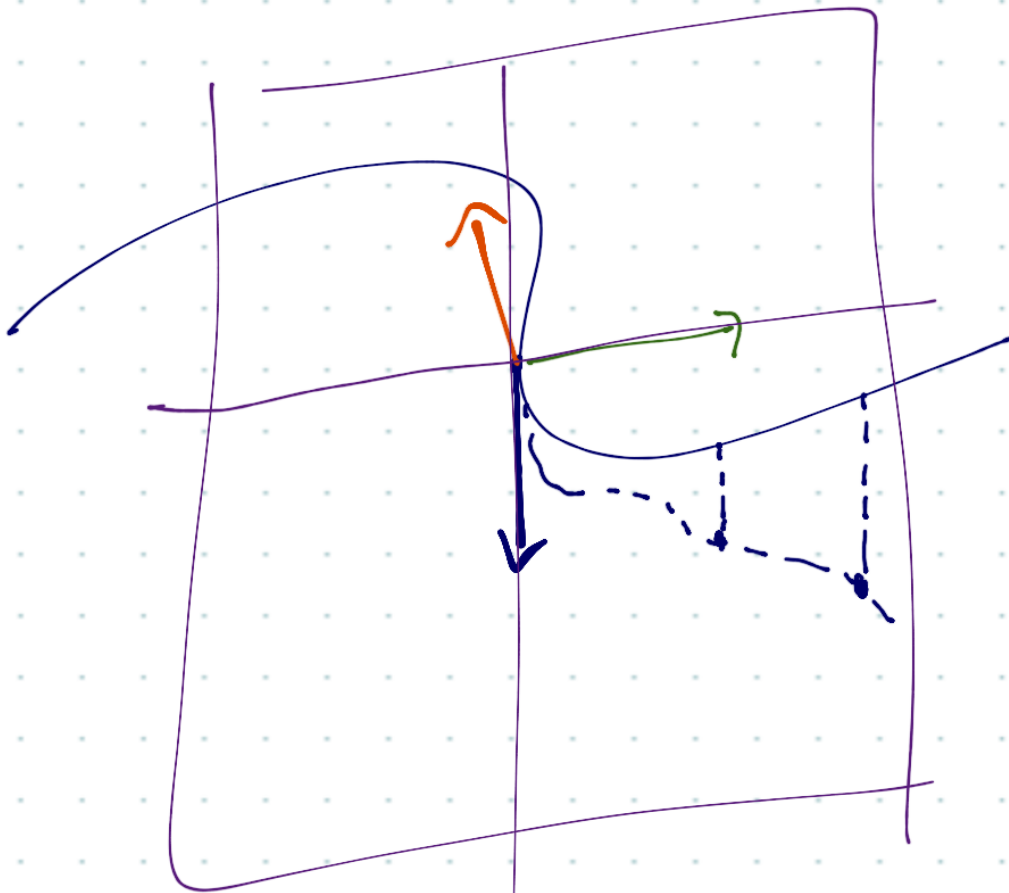
$$\gamma'' = \partial_s T = |\gamma''| \frac{\gamma''}{|\gamma''|}$$

$$= |\gamma''| N$$

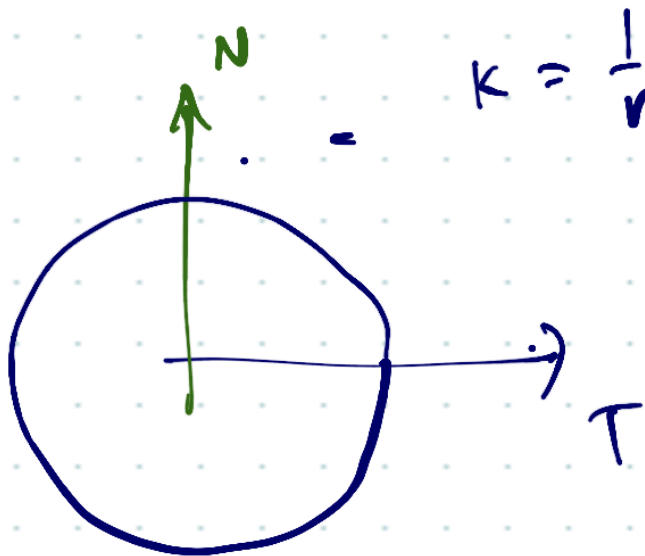
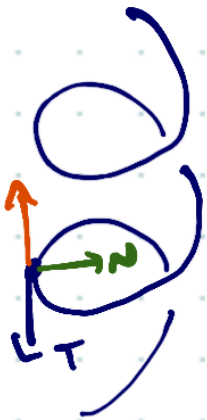
$$= k N$$

$$k > 0$$

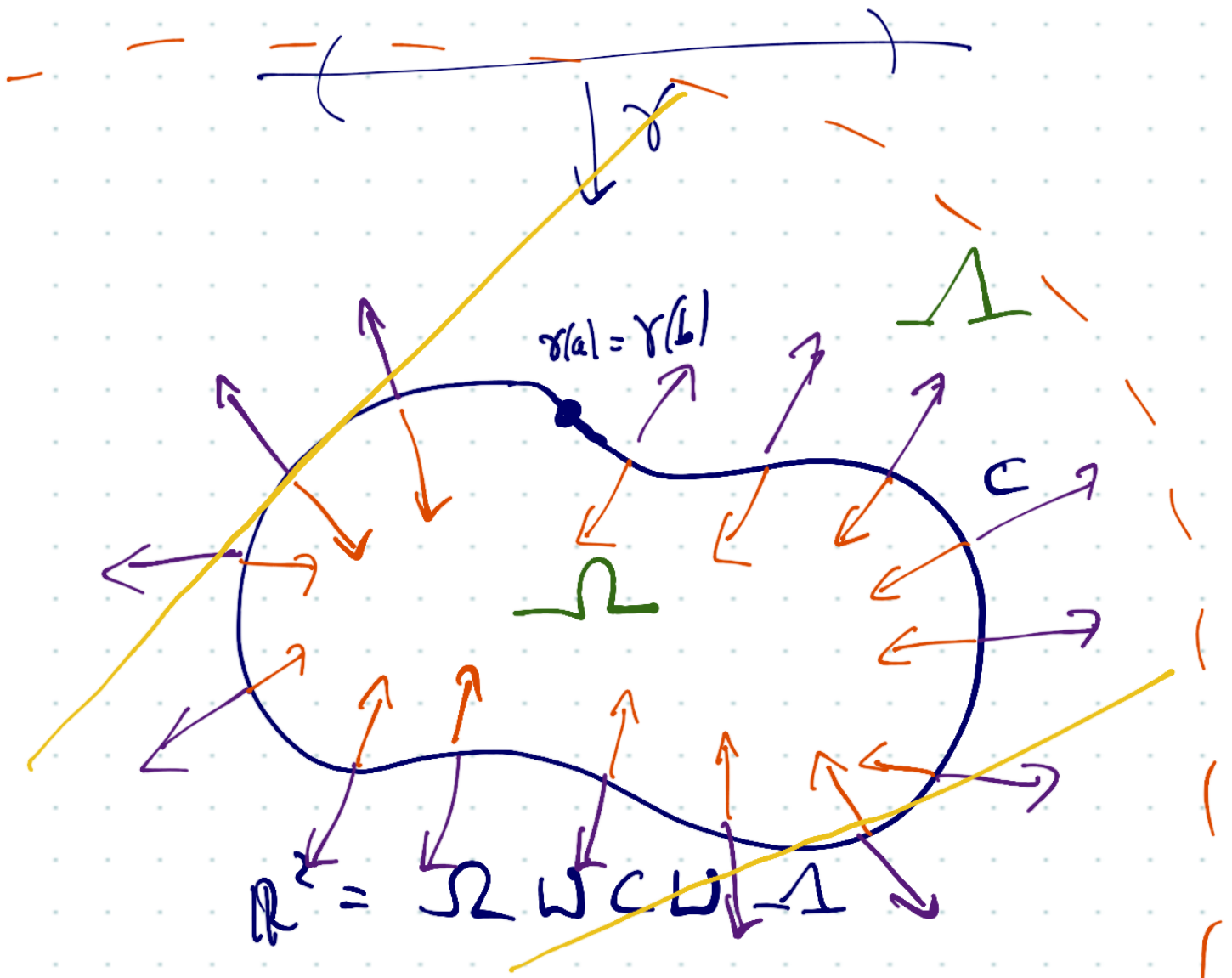
Osculating Plane & F-S Frame



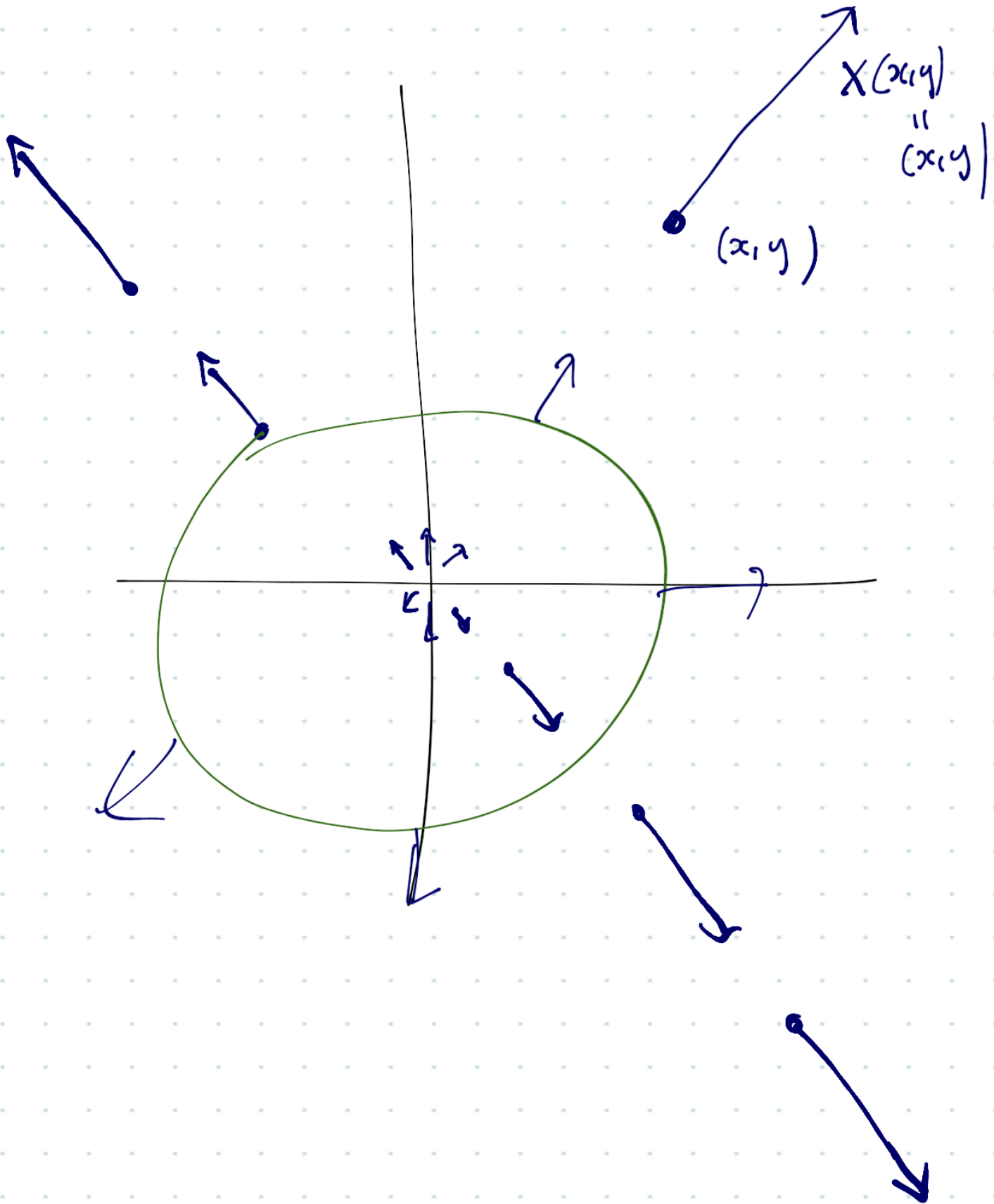
$\kappa \neq 0$ & $\tau \neq 0$ \Leftrightarrow helix
 & $\kappa = 0$ \Leftrightarrow straight line



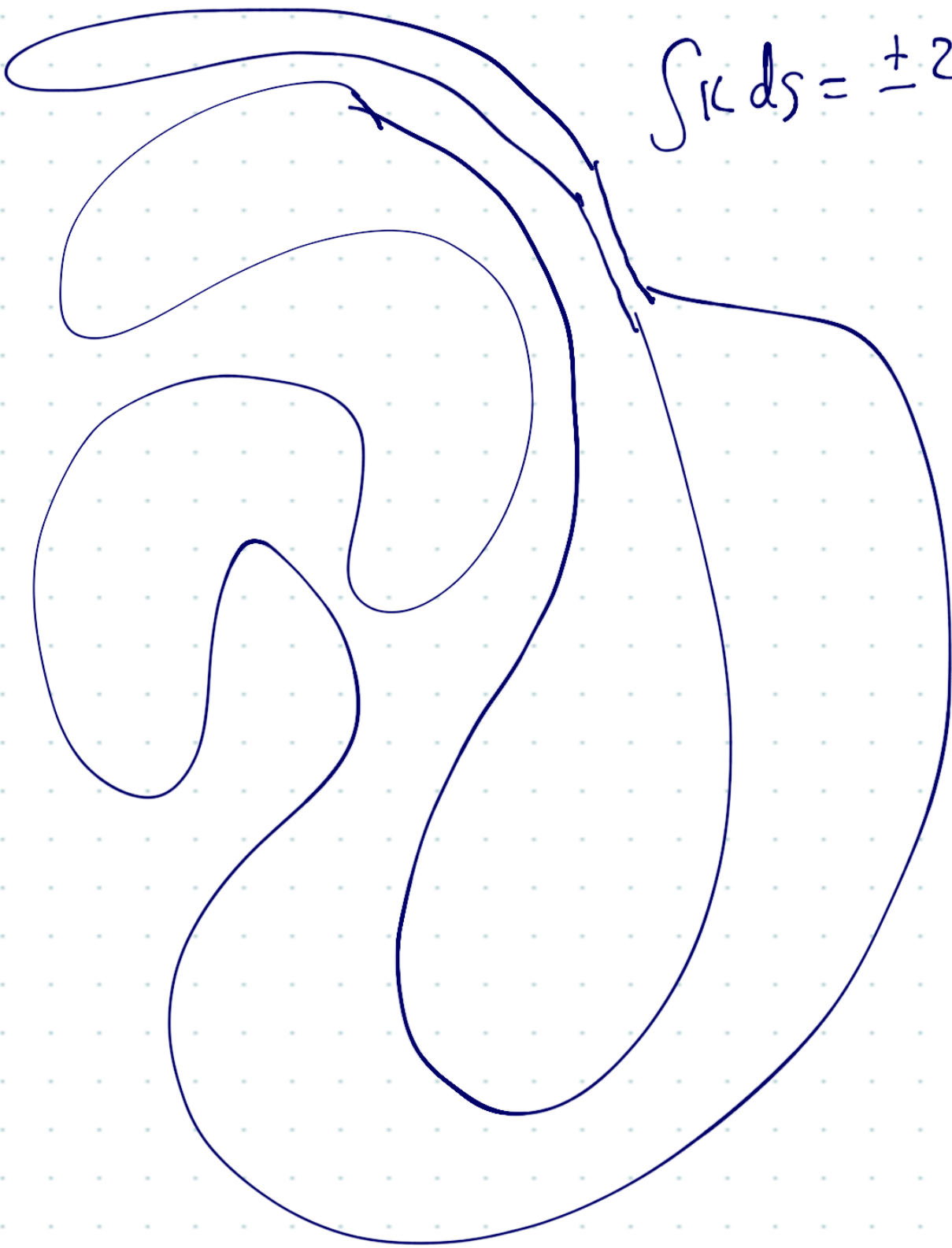
$$\kappa = \frac{1}{r}$$

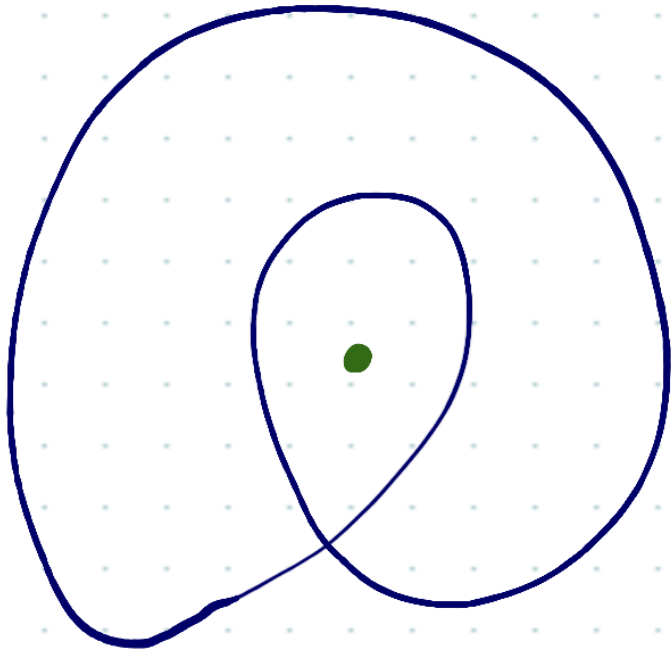


$B_R(0)$

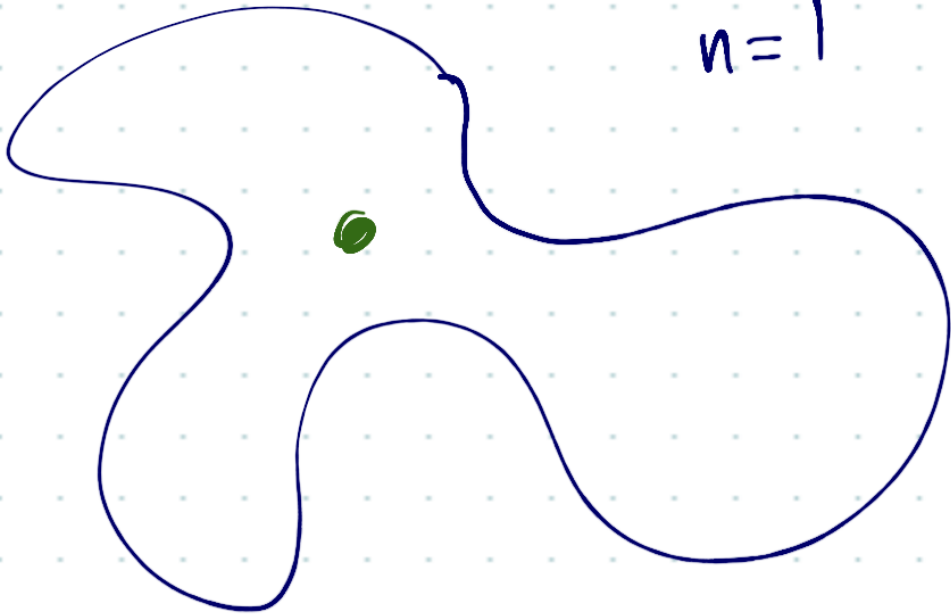


$$\int \kappa ds = \pm 2\pi$$





winding = 2



n=1