

Connection

$$d\sigma_1 = \omega_{12} \wedge \sigma_2 \\ \Rightarrow d\sigma_1(\hat{e}_1, \hat{e}_2) = \omega_{12}(\hat{e}_1)$$

$$d\sigma_2 = -\omega_{12} \wedge \sigma_1 \\ = \sigma_1 \wedge \omega_{12} \\ \Rightarrow d\sigma_2(\hat{e}_1, \hat{e}_2) = \omega_{12}(\hat{e}_2)$$

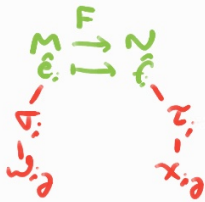
$$\therefore \omega_{12} = d\sigma_1(\hat{e}_1, \hat{e}_2)\sigma_1 + d\sigma_2(\hat{e}_1, \hat{e}_2)\sigma_2$$

check: sphere: $\sigma_1 = r d\theta$, $\sigma_2 = r \sin\theta d\phi$
 $\Rightarrow d\sigma_1 = 0$, $d\sigma_2 = r \cos\theta d\theta \wedge d\phi$
 $= \frac{\cot\theta}{r} \sigma_1 \wedge \sigma_2$
 $\Rightarrow \omega_{12} = 0 + \frac{\cot\theta}{r} \sigma_2 = \cos\theta d\phi$

Isometry

$$\sigma_i = F^*(z_i)$$

$$\omega_{ij} = F^*(x_{ij})$$



$$\therefore F^*K = K!$$

Gaussian curvature is
isometric invariant