作业 12.

考查正则曲面片 $r: D \to E^3$

$$(u,v) \mapsto r(u,v)$$

在 $P = r(u_0, v_0)$ 处的切平面上取标准正交的切向量 e_1, e_2.

证明：存在参数变换 ~~$\sigma: (\bar{u}, \bar{v}) \to (u, v)$~~

$$\sigma: \bar{D} \longrightarrow D$$

$$(\bar{u}, \bar{v}) \longmapsto (u, v) = \sigma(\bar{u}, \bar{v})$$

使得 $\bar{r}(\bar{u}, \bar{v}) := r \circ \sigma(\bar{u}, \bar{v})$ 和 ~~$(\bar{u}_0, \bar{v}_0) = \sigma^{-1}(u_0, v_0)$~~

在 $P = \bar{r}(\bar{u}_0, \bar{v}_0)$ 处有

$$\bar{r}_{\bar{u}}(\bar{u}_0, \bar{v}_0) = e_1, \quad \bar{r}_{\bar{v}}(\bar{u}_0, \bar{v}_0) = e_2.$$