

$$\iiint_R f(x, y, z) \, dR = \int_{z_1}^{z_2} \int_{\varphi_1(z)}^{\varphi_2(z)} \int_{r_1(\varphi, z)}^{r_2(\varphi, z)} F(r, \varphi, z) r \, dr \, d\varphi \, dz$$

$$= \int_{\varphi_1(z)}^{\varphi_2(z)} \int_{\vartheta_1(\varphi)}^{\vartheta_2(\varphi)} \int_{r_1(\vartheta, \varphi)}^{r_2(\vartheta, \varphi)} F(r, \vartheta, \varphi) r^2 \sin \vartheta \, dr \, r \, d\vartheta \, d\varphi$$

