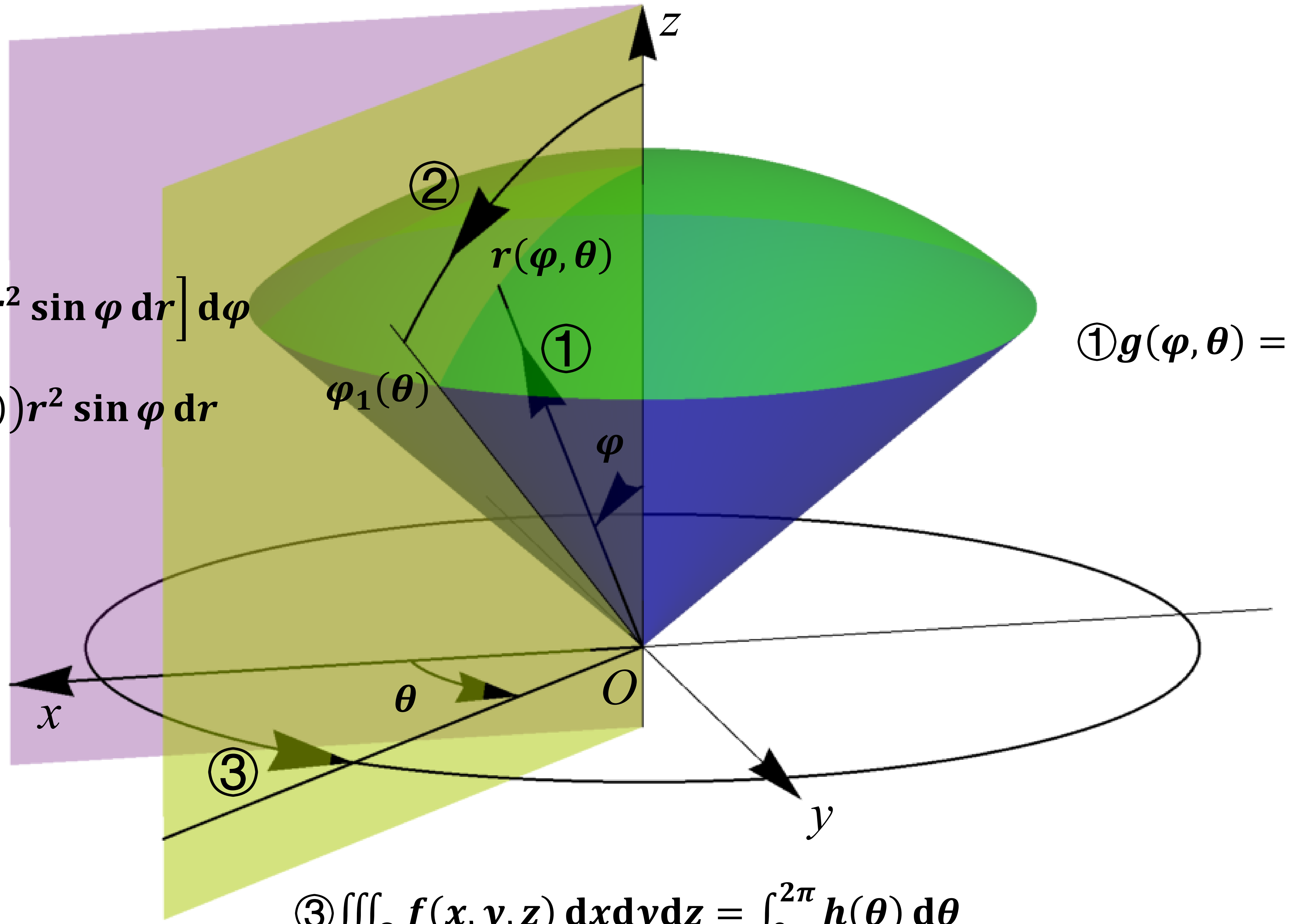
②$h(\boldsymbol{\theta}) = \int_0^{\varphi_1(\theta)} g(\varphi,\theta)\,\mathrm{d}\varphi$

$= \int_0^{\varphi_1(\theta)} \left[\int_0^{r(\varphi,\theta)} f\big(x(r,\varphi,\theta),y(r,\varphi,\theta),z(r,\varphi,\theta)\big) r^2 \sin\varphi\,\mathrm{d}r\right] \mathrm{d}\varphi$

$= \int_0^{\varphi_1(\theta)} \mathrm{d}\varphi \int_0^{r(\varphi,\theta)} f\big(x(r,\varphi,\theta),y(r,\varphi,\theta),z(r,\varphi,\theta)\big) r^2 \sin\varphi\,\mathrm{d}r$



①$g(\varphi,\theta) = \int_0^{r(\varphi,\theta)} f\big(x(r,\varphi,\theta),y(r,\varphi,\theta),z(r,\varphi,\theta)\big) r^2 \sin\varphi\,\mathrm{d}r$

③$\iiint_\Omega f(x,y,z)\,\mathrm{d}x\mathrm{d}y\mathrm{d}z = \int_0^{2\pi} h(\theta)\,\mathrm{d}\theta$

$= \int_0^{2\pi} \left[\int_0^{\varphi(\theta)} \mathrm{d}\varphi \int_0^{r(\varphi,\theta)} f\big(x(r,\varphi,\theta),y(r,\varphi,\theta),z(r,\varphi,\theta)\big) r^2 \sin\varphi\,\mathrm{d}r\right] \mathrm{d}\theta$

$= \int_0^{2\pi} \mathrm{d}\theta \int_0^{\varphi(\theta)} \mathrm{d}\varphi \int_0^{r(\varphi,\theta)} f\big(x(r,\varphi,\theta),y(r,\varphi,\theta),z(r,\varphi,\theta)\big) r^2 \sin\varphi\,\mathrm{d}r$