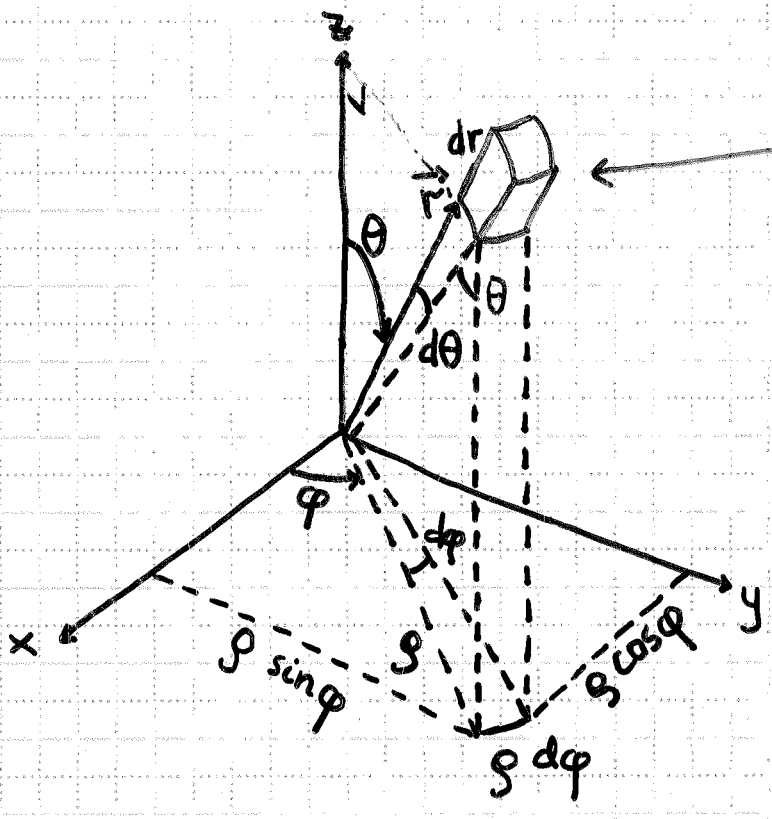
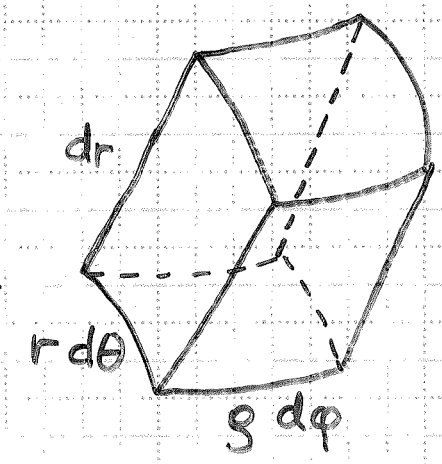
Volumelement i kulekoordinater: (r, θ, φ)





$$\Rightarrow dV = (dr)\cdot(r\,d\theta)\cdot(\varrho\,d\varphi)$$

$$\varrho = r \sin\theta$$

$$\Rightarrow dV = r^2 \, dr \, \sin\theta \, d\theta \, d\varphi$$

$z = r\cos\theta$; $y = \varrho \sin\varphi = r \sin\theta \sin\varphi$;
$x = \varrho \cos\varphi = r \sin\theta \cos\varphi$

r : avstand fra sentrum (origo), $r = \sqrt{x^2 + y^2 + z^2}$

θ, φ : retning i rommet (i forhold til x, y, z)

alle mulige retninger: $0 \le \theta \le \pi$

$0 \le \varphi \le 2\pi$

Eks: $\theta = 0 \;\hat{=}$ langs $\hat{z}$

$(\theta = \pi/2, \varphi = 0) \;\hat{=}$ langs $\hat{x}$

$(\theta = \pi/2, \varphi = -\pi/2) \;\hat{=}$ langs $-\hat{y}$