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> restart : with(VectorCalculus) : with(LinearAlgebra) :
  SetCoordinates(cylindrical[rho, theta, z]) :
> v1 := VectorField([diff(rho*cos(theta), rho), diff(rho*sin(theta), rho), diff(rho
  ·tan(theta)·sin(theta), rho)]) :
> v2 := VectorField([diff(rho*cos(theta), theta), diff(rho*sin(theta), theta),
  diff(rho·tan(theta)·sin(theta), theta)]) :
> cross := CrossProduct(v1, v2)
cross :=
  [[sin(theta) (rho (1 + tan(theta)^2) sin(theta) + rho tan(theta) cos(theta))
  - tan(theta) sin(theta) rho cos(theta)],
  [-cos(theta) (rho (1 + tan(theta)^2) sin(theta) + rho tan(theta) cos(theta)) - tan(theta) sin(theta)^2 rho],
  [cos(theta)^2 rho + sin(theta)^2 rho]]
> assume(rho R 0) :
n := 
$$\frac{\text{simplify}(\text{sqrt}(\text{cross}[1]^2 + \text{cross}[2]^2 + \text{cross}[3]^2))}{\text{rho}}$$

  # we doen de jacobiaan weg en voegen hem ergens anders toe
  
$$n := \sqrt{-2 + 2 \sec(\theta)^2 + \sec(\theta)^4}$$

> # eerst calculeren we de rho gedeelte
> assume(theta R 0, theta ≤ 2*Pi);
res1 := int(rho·(1 -  $\frac{\rho^2}{R^2}$ ), rho = 0..R)

$$\text{res1} := \frac{R^2}{4}$$

> res2 := int(n, theta = 0..2·Pi)

$$\text{res2} := \int_0^{2\pi} \sqrt{-2 + 2 \sec(\theta)^2 + \sec(\theta)^4} d\theta$$

> res1·res2·v0·rho0

$$\frac{R^2 \left( \int_0^{2\pi} \sqrt{-2 + 2 \sec(\theta)^2 + \sec(\theta)^4} d\theta \right) v0 \rho0}{4}$$


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