

HOMEWORK 25
CALCULUS III
DUE 04-30

Show your work!

- (1) Re-work Example 15.6.5 on p. 1119, using cylindrical coordinates

$$\vec{r}(r, \theta) = \langle r \cos(\theta), r \sin(\theta), 4 - r^2 \rangle.$$

(Don't confuse the vector \vec{r} with the parameter r !)

- (2) Compute $\iint_S \vec{F} \cdot \vec{N} \, dS$, where

- $\vec{F}(x, y, z) = \langle y^2, xz, e^{xy} \rangle$,
 - S is the part of the cylinder of radius 2 centred on the z -axis between $z = 1$ and $z = 3$,
and
 - \vec{N} is the outward-pointing normal vector.
- **Eleven** book problems: #15.5.1–6, 22, 23 and #15.6.27, 30, 31. For #15.6.31, **do not** use Gauss's law; instead, compute the answer directly.