

## 427L: integration over surfaces

1. Find a parameterization of the cylinder  $S$  given by  $y^2 + z^2 = 4$ ,  $0 \leq x \leq 1$ . Then find the integral

$$\iint_S x - y^2 + z \, dS.$$

2. Find a parameterization of the cylinder  $S$  of radius 2 whose axis lies along the vector  $\langle 1, -2, 0 \rangle$ , and which lies between the planes  $x - 2y = 0$  and  $x - 2y = 15$ . Then find the integral

$$\iint_S x + z \, dS.$$

3. Let  $\mathbf{F}$  be the (constant) vector field  $2\mathbf{k}$ . Evaluate the integral

$$\iint_S \mathbf{F} \cdot d\mathbf{S},$$

where  $S$  is the surface from the previous question.