

## Lecture 23: Triple integrals

1 Evaluate the integral

$$\int_0^{2\pi} \int_u^{2\pi} \int_0^{\sqrt{1+v^2}} 5 \, dzdvdu .$$

2 Integrate  $f(x, y, z) = xz$  over the hoof solid  $x^2 + y^2 \leq 1, 0 \leq z \leq x$ . The hoof solid was considered by Archimedes already.

- 3 a) Find the volume of the cone with base radius 2 and height 2 by reducing it to a single variable integral.  
b) Find the volume of a cone with base radius 2 and height 2 by reducing it to a double integral.

