

Lecture 24: Worksheet**Applications of integration**

- 1 Find the cumulative distribution function

$$F(x) = \int_{-\infty}^x f(t) dt .$$

of the exponential distribution in the case $f(x) = 2 \exp(-2x)$.

- 2 Find the moment of inertia of a rod which has density $f(x) = x$ and length 10.

$$\int_0^L x^2 f(x) dx .$$

- 3 How much heat energy is in a sphere of radius 1 if the heat at height z is z ? Remember that if $A(z)$ is the radius of the sphere at height z then $\int_{-1}^1 A(z) dz$ was the volume. You have to compute

$$\int_{-1}^1 z A(z) dz / V .$$