

## Computational physics: Exercises 2

The normal function (normalized to total area 1) with mean value zero and sigma 1 is

$$f(x) = \frac{1}{\sqrt{2\pi}} e^{-\frac{x^2}{2}}$$

Evaluate  $\int_{-t}^t f(x) dx$  where  $t = 1, 2, 3, 4, 5$  with precision

$$\varepsilon = 10^{-7}$$

using the trapezoidal and Simpson rule. Compare convergence speed. Compare values with these values:

t	Value(t)
1	0.68268949
2	0.95449974
3	0.99730020
4	0.99993666
5	0.99999943

When using an observable which is normally distributed, the probability to find the observable outside  $t$  from the mean value is  $P = 1 - \text{value}(t)$