Task for lecture 8

- Consider the following integrals.

$$\int_0^1 \cos(x^2)e^{-x}dx \tag{1}$$

$$\int_0^1 \sqrt{x}\cos(x^2)e^{-x}dx \tag{2}$$

$$\int_0^1 1000 \cdot e^{\left(\frac{-1}{x}\right)} \cdot e^{\left(\frac{-1}{1-x}\right)}dx \tag{3}$$

$$\int_0^1 \frac{1}{\sqrt{x}}\cos(x^2)e^{-x}dx \tag{4}$$

- Approximate each of the integrals using the *the midpoint method*, *the trapezoidal method* and *Simpson's method*.
- Apply *Richardson Extrapolation* to evaluate the order of the method and estimate the error.