1. Derive a five-point Gaussian formula to approximate

$$\int_A^B y(x)\, dx$$

   and apply it to our usual benchmark of

$$\int_0^{\pi/2} \sin(x)\, dx$$

2. Derive a formula to approximate $y'''(x)$ based on the values of $y(x-h)$, $y(x)$, $y(x+h)$ and $y(x+2h)$. Apply it to

$$y(x) = \frac{\sin(x)}{x} \cdot e^{-x}$$

   at $x = 1$ using $h = 0.01$ and $h = 0.005$. Compare your answers with the exact value.