

Computer Assignment # 5

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1. A definite integral $\int_a^b f(t)dt$ can be evaluated by solving the equivalent ODE $y'(t) = f(t)$, $a \leq t \leq b$, with initial condition $y(a) = 0$. The value of the integral is then simply $y(b)$. Consider error function

$$\text{erf}(t) = \frac{2}{\sqrt{\pi}} \int_0^t e^{-\tau^2} d\tau$$

the corresponding IVP problem is:

$$\begin{aligned} y'(t) &= \frac{2}{\sqrt{\pi}} e^{-t^2} \\ y(0) &= 0 \end{aligned}$$

Use the built-in MATLAB program **'ode23'** to solve the differential equation $y(t)$ in the interval $0 \leq t \leq 2$.

Plots the solution: **plot** (t , y) and plot error using the built-in Matlab function **erf: plot** (t , $\log_{10}(\text{erf}(t) - y)$).

Please turn in your plot. (Make sure to twll what h and tolerance you used).