

MATH 373: CLASS 18

1. EXERCISE

1) Use Gaussian Quadrature with one point and two point to approximate:

$$\int_{-1}^1 e^{\cos(x)} dx. \quad (\text{The exact value of the integration is } 4.683149683.)$$

2) Solve the following differential equation.

a) $y' + y^2 * \sin(t) = 0.$

b) $ty' - y = t^2 e^{-t}, \quad t > 0.$

3) Check the Lipschitz condition of the given function f . If Lipschitz condition satisfies then find Lipschitz constant.

a) $y = 0$ if $t \geq 0$ and 1 if $t < 0.$

b) $y = \sin(t), \quad t \in [0, 2\pi].$

c) $y = e^{2\cos(t)}, \quad t \in [0, 5].$