Lorenz Equations (7.6)

1. $dx/dt = 10(-x + y), \quad dy/dt = 5x - y - xz, \quad dz/dt = -\frac{8}{3}z + xy$

Euler's Method and Accuracy of Numerical Methods (8.1 & 8.2)

Complete the following for each IVP below.

A) Calculate approximate values of the solution of the IVP at $t = 0.1$ and $t = 0.2$ using the Euler method with $h = 0.1$.

B) Repeat part **A)** with $h = 0.05$.

C) Compare **A)** and **B)** to the true solution $\phi(t)$ at $t = 0.2$.

D) Construct a formula for the local truncation error in terms of t and the solution ϕ for both values of h.

Initial Value Problems:

1. $y' = 2y - 1, \quad y(0) = 1$

2. $y' = 2 - t + 2y, \quad y(0) = 1$