Theoretical Models for Computing

Quiz #10

Student Name: Student ID:

1. Solve the following initial value problem over the interval from t = 0 to 2 where $y(0)$ = 1.

$$\frac{dy}{dt} = yt^3 - 1.5y$$

(a) Euler's method with h = 0.5 and 0.25.
(b) Midpoint method with h = 0.5.

2. Given

$$\frac{dy}{dt} = -100{,}000y + 99{,}999e^{-t}$$

If y(0) = 0, use the implicit Euler to obtain a solution from t =0 to 2 using a step size of 0.1