MATH 3313

C & N Sec 1.5

1) $\frac{dx}{dt} = x - t \quad x(0) = 1 \quad b = 2 \quad h = 0.5$

$x(0.5) = x(0) + \frac{dx}{dt}(0)\,0.5$

$= x(0) + (x(0) - 0)(0.5)$

$= 1 + (1 - 0)(0.5) = 1.5$

$x(1.0) = x(0.5) + \frac{dx}{dt}(0.5)\,0.5$

$= x(0.5) + (x(0.5) - 0.5)(0.5)$

$= 1.5 + (1.5 - 0.5)(0.5) = 2.0$

$x(1.5) = x(1.0) + (x(1.0) - 1.0)\,0.5$

$= 2 + (2 - 1)(0.5) = 2.5$

$x(2.0) = x(1.5) + (x(1.5) - 1.5)(0.5)$

$= 2.5 + (2.5 - 1.5)(0.5) = 3.0$

3) $\frac{dx}{dt} = -tx^2 \quad x(0) = 1 \quad b = 2 \quad h = 1$

$x(1) = x(0) + \frac{dx}{dt}(0)(1)$

$= x(0) + (-(0)(1)^2)(1) = 1$

$x(2) = x(1) + (-(1)1^2)(1)$

$= 1 - 1 = 0$