

SULTAN QABOOS UNIVERSITY
DEPARTMENT OF MATHEMATICS AND STATISTICS

Math 4141

Fall 2010

Quiz 3

Time: 30 minutes

Name:

Section:

Number:

Show your complete, mathematically correct and neatly written solution.

Depend on the following differential equation to answer all questions.

$$y'(t) = 1 + (t - y)^2, \quad 2 \leq t \leq 3, \quad y(2) = 1. \quad (1)$$

Q1: Show that Eq. (1) has a unique solution for $2 \leq t \leq 3$. *(3 points)*

Q2: Take $h = 0.5$ and use Euler's method to approximate the solution of Eq. (1). *(4 points)*

Q3: *(4 points)*

Take $h = 0.5$ and use Taylor's method of order 2 to approximate the solution of Eq. (1).

Q4: *(4 points)*

Take $h = 0.5$ and use the Modified Euler method to approximate the solution of Eq. (1).

Good Luck