## **Suggested Homework for Lecture 10**

## Math 116

- (1) Using the given information and value of  $x_1$ , find  $x_2$  using Newton's method.
  - (1a)  $x_1 = 2$ , f(2) = 6, f'(2) = 2(1b)  $x_1 = 5$ , f(5) = 10, f'(5) = -10(1c)  $x_1 = 0$ , f(0) = f'(0) = 3
- (2) An equation f(x) and initial guess x<sub>1</sub> are given. Using Newton's method, find x<sub>2</sub>.
  (2a) f(x) = x<sup>3</sup> 2, x<sub>1</sub> = 1
  (2b) f(x) = x<sup>4</sup> x<sup>2</sup> 1, x<sub>1</sub> = 2
  (2c) f(x) = x<sup>5</sup> 3, x<sub>1</sub> = 2
- (3) An equation f(x) and initial guess x₁ are given. Using Newton's method, find x₂ and x₃.
  (3a) f(x) = x² x 1, x₁ = 1
  (3b) f(x) = e<sup>x</sup> 2, x₁ = 0
  (3c) f(x) = ln(x) 1, x₁ = 1

## Answers to Suggested Homework for Lecture 10

Math 116

(1a)  $x_2 = -1$ (1b)  $x_2 = 6$ (1c)  $x_2 = -1$ (2a)  $x_2 = \frac{4}{3}$ (2b)  $x_2 = \frac{53}{28}$ (2c)  $x_2 = \frac{131}{80}$ (3a)  $x_2 = 2, x_3 = \frac{5}{3}$ (3b)  $x_2 = 1, x_3 = \frac{2}{e}$ (3c)  $x_2 = 2, x_3 = 4 - 2\ln(2)$