THE SOUTH CHINA NORMAL UNIVERSITY

School of Mathematical Sciences

Numerical Analysis (2022–2023 The Second Term)

Homework 3

Due Date: March 26, 2024 (Tuesday)

Name: _____ Student No.: _____ Date: March 21, 2024

§2.4 Exercises for Newton-Raphson and Secant Methods

Exercise 1. Let $f(x) = x^2 - x - 3$.

(a) Find the Newton-Raphson formula $p_k = g(p_{k-1})$.

(b) Start with $p_0 = 1.6$ and find p_1, p_2, and p_3.

(c) Start with $p_0 = 0.0$ and find p_1, p_2, p_3, and p_4. What do you conjecture about this sequence?

Exercise 2. Let $f(x) = x^3 - 3x - 2$.

(a) Find the Newton-Raphson formula $p_k = g(p_{k-1})$.

(b) Start with $p_0 = 2.1$ and find p_1, p_2, p_3, and p_4.

(c) Is the sequence converging quadratically or linearly?