Foundation Algebra for Physical Sciences and Engineering (CELEN036)

Homework 6 Answers

1. $x_3 = 0.625$.

2.

a. $x_7 = 0.5859$ b. $x_8 = 3.002$ c. $x_7 = 3.419$.

3.

a. $x_{17} = 0.64118$

b. $x_{17} = 0.25753$

c. $x_{17} = -2.19131$

d. $x_{14} = 0.29753$.

Note: In the examination, the starting point x_0, and the iteration formula $g(x)$ would be given.

4. With $g(x) = (3x^2 + 3)^{1/4}$ and $x_0 = 1$, $x_6 = 1.94$ is accurate to within 0.01.

5. $g(x) = \pi + 0.5\sin(x/2)$ has a unique fixed point on $[0, 2\pi]$. Therefore use $x_{n+1} = g(x_n) = \pi + 0.5\sin(x_n/2)$ as iterative formula. $x_3 = 3.63$.

6. For $x_0 = 1.0$ and $f(x) = x^2 - 3 = 0$, $g(x) = 0.5(x + 3/x)$, $x_{n+1} = 0.5(x_n + 3/x_n)$ we have $\sqrt{3} \approx x_4 = 1.7321$.

7. With $g(x) = \dfrac{1}{\pi}\arcsin\left(-\dfrac{x}{2}\right) + 2$, we have $x_5 = 1.68$.