AQA – Numerical methods – A2 Mathematics P1

1. June/2021/Paper_7357/1/No.7

The equation $x^2 = x^3 + x - 3$ has a single solution, $x = \alpha$

(a) By considering a suitable change of sign, show that α lies between 1.5 and 1.6

[2 marks]

(b) Show that the equation $x^2 = x^3 + x - 3$ can be rearranged into the form

$$x^2 = x - 1 + \frac{3}{x}$$

[2 marks]

(c) Use the iterative formula

$$x_{n+1} = \sqrt{x_n - 1 + \frac{3}{x_n}}$$

with $x_1 = 1.5$, to find x_2, x_3 and x_4, giving your answers to four decimal places.

[2 marks]