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1. (i) $f(x) = x^3 + 4x - 6$

(a) Show that the equation $f(x) = 0$ has a root α in the interval $[1, 1.5]$

(2)

(b) Taking 1.5 as a first approximation, apply the Newton Raphson process twice to $f(x)$ to obtain an approximate value of α. Give your answer to 3 decimal places. Show your working clearly.

(4)

(ii) $g(x) = 4x^2 + x - \tan x$

where x is measured in radians.

The equation $g(x) = 0$ has a single root β in the interval $[1.4, 1.5]$

Use linear interpolation on the values at the end points of this interval to obtain an approximation to β. Give your answer to 3 decimal places.

(4)

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Question 1 continued

(Total 10 marks)

Q1