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1. $$f(x) = x^3 - \frac{10\sqrt{x} - 4x}{x^2} \qquad x > 0$$

(a) Show that the equation $f(x) = 0$ has a root α in the interval [1.4, 1.5]

(2)

(b) Determine $f'(x)$.

(3)

(c) Using $x_0 = 1.4$ as a first approximation to α, apply the Newton-Raphson procedure once to $f(x)$ to calculate a second approximation to α, giving your answer to 3 decimal places.

(2)

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Question 1 continued

Q1

(Total 7 marks)