3: **In this question you must show all stages of your working.**
Solutions relying entirely on calculator technology are not acceptable.

(i) $f(x) = x^2 + 5 - 8^{5x}$

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

use interval bisection to determine an interval of width 0.25 that contains α.

(3)

(ii) $g(x) = 3^{\sin x} - 3\cos x$

where x is in radians.

(a) Show that the equation $g(x) = 0$ has a root, β, in the interval [4, 5]

(2)

(b) Use linear interpolation once on the interval [4, 5] to determine an approximation for β.
Give your answer to 4 significant figures.

(2)

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Question 3 continued

(Total for Question 3 is 7 marks)