5. **In this question you must show all stages of your working.**

Solutions relying entirely on calculator technology are not acceptable.

(a) Show that $\sin 3x$ can be written in the form

$$P\sin x + Q\sin^3 x$$

where P and Q are constants to be found.

(4)

(b) Hence or otherwise, solve, for $0 < \theta \leqslant 360°$, the equation

$$2\sin 3\theta = 5\sin 2\theta$$

giving your answers, in degrees, to one decimal place as appropriate.

(4)

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Question 5 continued

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Question 5 continued

(Total for Question 5 is 8 marks)

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6. The functions f and g are defined by

$$f(x) = 6 - \frac{21}{2x + 3} \qquad x \geqslant 0$$

$$g(x) = x^2 + 5 \qquad x \in \mathbb{R}$$

(a) Find gf(2)

(2)

(b) Find f^{-1}

(3)

(c) Solve the equation

$$gg(x) = 126$$

(3)

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