15 (a) Show that the equation $x^3 + 7x - 5 = 0$ has a solution between $x = 0$ and $x = 1$

(2)

(b) Show that the equation $x^3 + 7x - 5 = 0$ can be arranged to give $x = \dfrac{5}{x^2 + 7}$

(2)

(c) Starting with $x_0 = 1$, use the iteration formula $x_{n+1} = \dfrac{5}{x_n^2 + 7}$ three times to find an estimate for the solution of $x^3 + 7x - 5 = 0$

....

(3)

(d) By substituting your answer to part (c) into $x^3 + 7x - 5$,
comment on the accuracy of your estimate for the solution to $x^3 + 7x - 5 = 0$

....

....

(2)

(Total for Question 15 is 9 marks)

16 The petrol consumption of a car, in litres per 100 kilometres, is given by the formula

$$\text{Petrol consumption} = \frac{100 \times \text{Number of litres of petrol used}}{\text{Number of kilometres travelled}}$$

BM16A

Nathan's car travelled 148 kilometres, correct to 3 significant figures.
The car used 11.8 litres of petrol, correct to 3 significant figures.

Nathan says,

"My car used less than 8 litres of petrol per 100 kilometres."

Could Nathan be wrong?
You must show how you get your answer.

(Total for Question 16 is 3 marks)

Turn over ▶