

Full marks are not necessarily awarded for a correct answer with no working. Answers must be supported by working and/or explanations. Where an answer is incorrect, some marks may be given for a correct method, provided this is shown by written working. You are therefore advised to show all working.

SECTION A

Answer **all** questions in the boxes provided.

1. [Maximum mark: 6]

In an arithmetic sequence, $u_1 = 2$ and $u_3 = 8$.

(a) Find d . [2 marks]

(b) Find u_{20} . [2 marks]

(c) Find S_{20} . [2 marks]

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Do **NOT** write solutions on this page.

9. [Maximum mark: 16]

The first three terms of a infinite geometric sequence are $m-1$, 6 , $m+4$, where $m \in \mathbb{Z}$.

- (a) (i) Write down an expression for the common ratio, r .
- (ii) Hence, show that m satisfies the equation $m^2 + 3m - 40 = 0$. [4]
- (b) (i) Find the two possible values of m .
- (ii) Find the possible values of r . [6]
- (c) The sequence has a finite sum.
- (i) State which value of r leads to this sum **and** justify your answer.
- (ii) Calculate the sum of the sequence. [6]



2. [Maximum mark: 7]

In an arithmetic sequence, the third term is 10 and the fifth term is 16.

- (a) Find the common difference. [2]
- (b) Find the first term. [2]
- (c) Find the sum of the first 20 terms of the sequence. [3]

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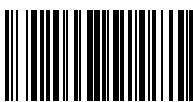
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7. [Maximum mark: 8]

The sums of the terms of a sequence follow the pattern

$$S_1 = 1 + k, S_2 = 5 + 3k, S_3 = 12 + 7k, S_4 = 22 + 15k, \dots, \text{ where } k \in \mathbb{Z}.$$

(a) Given that $u_1 = 1 + k$, find u_2 , u_3 and u_4 . [4]

(b) Find a general expression for u_n . [4]

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2. [Maximum mark: 6]

In an arithmetic sequence, the first term is 2 and the second term is 5.

- (a) Find the common difference. [2]
- (b) Find the eighth term. [2]
- (c) Find the sum of the first eight terms of the sequence. [2]

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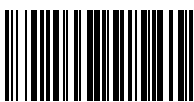
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3. [Maximum mark: 6]

In an arithmetic sequence $u_{10} = 8$, $u_{11} = 6.5$.

- (a) Write down the value of the common difference. [1]
- (b) Find the first term. [3]
- (c) Find the sum of the first 50 terms of the sequence. [2]

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