

**1** Here are the first five terms of an arithmetic sequence.

7      10      13      16      19

Find the sum of the first 100 terms of this sequence.

.....  
**(Total for Question 1 is 2 marks)**

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**2** An arithmetic series has first term 1 and common difference 4

Find the sum of all terms of the series from the 41st term to the 100th term inclusive.

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**(Total for Question 2 is 4 marks)**

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**3**  $(2x + 23)$ ,  $(8x + 2)$  and  $(20x - 52)$  are three consecutive terms of an arithmetic sequence.

Prove that the common difference of the sequence is 12

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**(Total for Question 3 is 4 marks)**

- 4 The first term of an arithmetic series  $S$  is  $-6$   
The sum of the first 30 terms of  $S$  is 2865  
Find the 9th term of  $S$ .

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(Total for Question 4 is 4 marks)

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**5** Work out the sum of the multiples of 3 between 1 and 1000

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**(Total for Question 5 is 4 marks)**

- 6 In an arithmetic series, the 6th term is 39  
In the same arithmetic series, the 19th term is 7.8

Work out the sum of the first 25 terms of the arithmetic series.

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(Total for Question 6 is 4 marks)

- 7 The 10th term of an arithmetic series,  $S$ , is 66  
The sum of the first 20 terms of  $S$  is 1290

Find the 5th term of  $S$ .

Show your working clearly.

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**(Total for Question 7 is 4 marks)**

**8** Here are the first five terms of an arithmetic sequence.

8      15      22      29      36

Work out the sum of all the terms from the 50th term to the 100th term inclusive.

.....  
**(Total for Question 8 is 4 marks)**



**9** An arithmetic series has first term  $a$  and common difference  $d$ .

The sum of the first  $2n$  terms of the series is four times the sum of the first  $n$  terms of the series.

Find an expression for  $a$  in terms of  $d$ .  
Show your working clearly.

$a = \dots\dots\dots$

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(Total for Question 9 is 4 marks)

- 10** The 25th term of an arithmetic series is 44.5  
The sum of the first 30 terms of this arithmetic series is 765

Find the 16th term of the arithmetic series.  
Show your working clearly.

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(Total for Question 10 is 5 marks)

**11** Here are the first four terms of an arithmetic series.

$$k \quad \frac{3k}{4} \quad \frac{k}{2} \quad \frac{k}{4}$$

Given that the 15th term of the series is  $(90 + 2k)$ ,

calculate the sum of the first 30 terms of the series.

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(Total for Question 11 is 5 marks)

- 12** The sum of the first  $N$  terms of an arithmetic series,  $S$ , is 292  
The 2nd term of  $S$  is 8.5  
The 5th term of  $S$  is 13

Find the value of  $N$ .

Show clear algebraic working.

$N = \dots\dots\dots$

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**(Total for Question 12 is 5 marks)**

- 13** The sum of the first 48 terms of an arithmetic series is 4 times the sum of the first 36 terms of the same series.

Find the sum of the first 30 terms of this series.

.....  

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**(Total for Question 13 is 5 marks)**

- 14** The sum of the first 10 terms of an arithmetic series is 4 times the sum of the first 5 terms of the same series.

The 8th term of this series is 45

Find the first term of this series.

Show clear algebraic working.

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**(Total for Question 14 is 5 marks)**

- 15** An arithmetic series has first term  $a$  and common difference  $d$ , where  $d$  is a prime number.

The sum of the first  $n$  terms of the series is  $S_n$  and

$$S_m = 39$$

$$S_{2m} = 320$$

Find the value of  $d$  and the value of  $m$

Show clear algebraic working.

$$d = \dots\dots\dots$$

$$m = \dots\dots\dots$$

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**(Total for Question 15 is 5 marks)**

- 16** The  $n$ th term of an arithmetic series is  $u_n$  where  $u_n > 0$  for all  $n$   
The sum to  $n$  terms of the series is  $S_n$

Given that  $u_4 = 6$  and that  $S_{11} = (u_6)^2 + 18$

find the value of  $u_{20}$



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**(Total for Question 16 is 6 marks)**

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**17** A polygon has  $n$  sides, where  $n > 5$

When arranged in order of size, starting with the largest number, the sizes of the interior angles of the polygon, in degrees, are the terms of an arithmetic sequence.

Here are the first five terms of this sequence.

177      175      173      171      169

Find the value of  $n$

Show clear algebraic working.

$n =$  .....

**(Total for Question 17 is 6 marks)**

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