

SET 9B

1. THE SUM TO n TERMS OF A CERTAIN SERIES IS $-n^2+31n$. Find the
- (i) first term
 - (ii) sum of the first six terms, the sum of the first five terms, and hence the sixth term
 - (iii) n -th term in simplest form
 - (iv) first three terms and the sixth term using (iii)

GIVEN SUM TO n TERMS, TO FIND n -TH TERM

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- (v) first value of n for which
- (a) the n -th term is negative
- (b) the sum to n terms is negative

2. THE SUM OF THE FIRST n TERMS OF A CERTAIN SERIES IS $27n-2n^2$.

- (i) Find the sum of the first 10 terms and of the first 9 terms. Hence obtain the value of the tenth term.
- (ii) Determine an expression for the n -th term in simplest form.
- (iii) Use the result of (ii) to find the first three terms and the tenth term.
- (iv) Find the first negative term.
- (v) Obtain the least value of value of n so that the sum to n terms is negative

3. FOR THE SEQUENCE $\{u_1, u_2, u_3, \dots, u_n, \dots\}$ IT IS KNOWN THAT $\sum_{r=1}^n u_r = n(2n+3)$

- (i) Prove that $u_n = 4n+1$
- (ii) Hence obtain the first 5 terms of the sequence.
- (iii) Show that the difference of each term from the preceding term is the same.
(Such a sequence is called an arithmetic sequence.)

4. THE SUM OF THE FIRST n TERMS OF THE SEQUENCE $\{u_n\}$, IS GIVEN BY $S_n = 3^n - 1$

- (i) Show that $u_n = 3^n - 3^{n-1} = 3^{n-1}(3-1) = 2 \cdot 3^{n-1}$
- (ii) Hence find the first 5 terms of the sequence.
- (iii) Show that ratio of each term to the preceding one is the same.
(Such a sequence is called a geometric sequence.)

5. THE SUM TO n TERMS OF A CERTAIN SERIES IS $2^{n+1} - 2$

- (i) Prove that the n -th term, u_n , is given by $u_n = 2^{n+1} - 2^n = 2^n(2-1) = 2^n$
- (ii) Hence find the first six terms of the series.

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1. (i) 30 (ii) 150; 130; 20 (iii) $u_n = 32-2n$ (iv) 30, 28, 26; $u_6 = 20$
 (v) first value of n is (a) 17 (b) 32
2. (i) 70; 81; -11 (ii) $u_n = 29-4n$ (iii) 25, 21, 17; -11 (iv) $u_8 = -3$ (v) 14
3. (i) 5, 9, 13, 17, 21
4. (i) 2, 6, 18, 54, 162 5. (i) 2, 4, 8, 16, 32, 64

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