

SEQUENCES & SERIES (Q 5, PAPER 1)

2000

- 5 (a) The n th term of a sequence is given by $T_n = n^2 + 1$.
- (i) Write down the first three terms of the sequence.
 - (ii) Show that $T_1 + T_2 + T_3 = T_4$.
- (b) The first term of a geometric series is 1 and the common ratio is $\frac{11}{10}$.
- (i) Write down the second, thirds and fourth terms of the series.
 - (ii) Calculate S_4 , the sum of the first four terms. Give your answer as a decimal.
- (c) The first three terms of an arithmetic series are $5 + 10 + 15 + \dots$
- (i) Find, in terms of n , an expression for T_n , the n th term.
 - (ii) Find, in terms of n , an expression for S_n , the sum to n terms.
 - (iii) Using your expression for S_n , find the sum of the natural numbers that are both multiples of 5 and smaller than 1000.

ANSWERS

5 (a) 2, 5, 10

(b) (i) $\frac{11}{10}, \frac{121}{100}, \frac{1331}{1000}$

(ii) 4.641

(c) (i) $T_n = 5n$

(ii) $S_n = \frac{n}{2}(5n + 5)$

(iii) 99,500