

QUESTION 2

- 2.1 Consider the geometric series: $4 + 2 + 1 + \frac{1}{2} + \dots$
- 2.1.1 Does this series converge? Justify your answer. (2)
- 2.1.2 Calculate S_{∞} . (2)
- 2.2 Given: $\sum_{p=k}^{10} 3^{p-1} = 29\,520$. Calculate the value of k . (5)
- [9]

QUESTION 3

- 3.1 Consider the quadratic number pattern: 3 ; 7 ; 12 ; ..
- 3.1.1 Show that the general term of this number pattern is given by

$$T_n = \frac{1}{2}n^2 + \frac{5}{2}n.$$
 (3)
- 3.1.2 What number must be added to T_{n-1} so that $T_n = 13\,527$? (4)
- 3.2 Given an arithmetic sequence with $T_1 = 8$ and $T_2 = 11$
- 3.2.1 Calculate the value of n if $T_n = 41$. (3)
- 3.2.2 A new arithmetic sequence P is formed using the term position and the term value of the given arithmetic sequence.
 For the new sequence, $P_8 = 1$, $P_{11} = 2$ and so forth.
- (a) Write down the value of P_{41} . (1)
- (b) Calculate the value of the first term of the new arithmetic sequence. (4)
- [15]