(b) In an arithmetic sequence, the sum of the first 4 terms is equal to the ninth term. Find the first term, *a*, in terms of the common difference, *d*. The summation of the first *n* term of an arithmetic sequence is given as: 

where *a* is the first term and *d* is the common difference and *n* is the number of terms. The *nth* term of an arithmetic sequence is given as:

 [7 marks]

(c) Given a geometric sequence with common ratio *r* where *r* is a real number and. If the sum of the first 24 terms is equal to 5 times the sum of the first 12 terms, find

1. the possible values of *r*. [6 marks]

(ii) the ratio of the sum of the first 24 terms to the sum of the first 36 terms. [6 marks]