

Arithmetic progressions

1Q

The 12th term of an arithmetic progression is 32.5, and the 20th term is 52.5. Find

- (a) the first term [2]
- (b) the common difference [2]
- (c) the sum of the first 18 terms. [2]

2Q

The 5th term of an arithmetic progression is 6, and the 15th term is 36. Find

- (a) the 20th term [5]
- (b) the sum of the first 20 terms. [2]

3Q

The sum of the first twenty terms of an arithmetic series is 325, and the sum of the first 30 terms is 712.5.

- (a) Find the common difference, d [5]
- (b) Find the sum of the first fifty terms [2]

4Q

The 10th term of an arithmetic progression is -2 , whilst the sum of the first thirty terms is 105.

- (a) Find the common difference, d [5]
- (b) Find the sum of the first sixty terms [2]

5Q

(a) Find the sum of the first 40 odd positive integers. [4]

(b) If you were told that the sum of the first n natural numbers is 15,400, find n [2]

6Q

The first term of an arithmetic progression is 1, and the sum of the first 20 terms is 1,540

- (a) Find the common difference [3]
- (b) Find the 30th term of the series [2]

7Q

Given the arithmetic progression $-5, -2, 1, 4, \dots$,
how many terms are needed so that the sum of the series is 918. [4]

8Q

An arithmetic series has a first term of 6 and a common difference of 3. The sum of the first p terms of the series is 5,130. Find p . [4]

9Q

For the series $22 + 18 + 14 + 10 + \dots$

- (a) Find the 30th term. [2]
- (b) Find the sum of the first fifty terms. [2]

10Q

- (a) An arithmetic series has first term a and common difference d . Prove that the sum of the first n terms, S_n , is given by

$$S_n = \frac{n}{2}(2a + (n-1)d) \quad [3]$$

- (b) The first term of an arithmetic progression is -12 and the common difference is 2. How many terms of the AP are required before the sum is positive?