

1. (a) The first term of an arithmetic sequence is -16 and the eleventh term is 39 . Calculate the value of the common difference.

(b) The third term of a geometric sequence is 12 and the fifth term is $\frac{16}{3}$.

All the terms in the sequence are positive.
Calculate the value of the common ratio.

(Total 8 marks)

2. The first term of an arithmetic sequence is 0 and the common difference is 12 .

(a) Find the value of the 96^{th} term of the sequence.

(2)

The first term of a geometric sequence is 6 . The 6^{th} term of the geometric sequence is equal to the 17^{th} term of the arithmetic sequence given above.

(b) Write down an equation using this information.

(2)

(c) Calculate the common ratio of the geometric sequence.

(2)

(Total 6 marks)

3. A geometric sequence has second term 12 and fifth term 324 .

(a) Calculate the value of the common ratio.

(4)

(b) Calculate the 10^{th} term of this sequence.

(3)

(c) The k^{th} term is the first term that is greater than 2000 . Find the value of k .

(3)

(Total 10 marks)

4. Consider the geometric sequence 16, 8, a , 2, b , ...
- (a) Write down the common ratio. (1)
- (b) Write down the value of
- (i) a ;
- (ii) b . (2)
- (c) The sum of the first n terms is 31.9375. Find the value of n . (3)
- (Total 6 marks)**

5. A geometric sequence has all its terms positive. The first term is 7 and the third term is 28.
- (a) Find the common ratio.
- (b) Find the sum of the first 14 terms.
- (Total 6 marks)**

6. Consider the geometric sequence 8, a , 2, ... for which the common ratio is $\frac{1}{2}$.
- (a) Find the value of a .
- (b) Find the value of the eighth term.
- (c) Find the sum of the first twelve terms.
- (Total 6 marks)**

7. A geometric sequence has 1024 as its first term and 128 as its fourth term.

(a) Show that the common ratio is $\frac{1}{2}$.

(2)

(b) Find the value of the eleventh term.

(2)

(c) Find the sum of the first eight terms.

(3)

(d) Find the number of terms in the sequence for which the **sum** first exceeds 2047.968.

(3)

(Total 10 marks)

8. The seventh term, u_7 , of a geometric sequence is 108. The eighth term, u_8 , of the sequence is 36.

(a) Write down the common ratio of the sequence.

(1)

(b) Find u_1 .

(2)

The sum of the first k terms in the sequence is 118 096.

(c) Find the value of k .

(3)

(Total 6 marks)