

- 1 Show that there are two geometric sequences such that the second term is 16 and the sum of the first three terms is 84.
- 2 Find the sum of the series.
 $1 + 3 + 4 + 6 + 7 + 9 + 10 + 12 + \dots + 46$
- 3 Three numbers a , b and c form an arithmetic sequence. The numbers c , a and b form a geometric sequence. If the sum of the numbers is $-\frac{9}{2}$, find the three numbers.

EXAM-STYLE QUESTIONS

- 4 The fourth term of an arithmetic series is 8. The sum of the first five terms is 25. Find the first five terms.
- 5 The sum of an arithmetic series is given by $S_n = n(2n + 3)$. Find the common difference and the first four terms of the series.
- 6 The numbers $a - 4$, $a + 2$ and $3a + 1$ are three consecutive terms of a geometric progression. Find the two possible values of the common ratio.

EXAM-STYLE QUESTIONS

- 5 S_n is the sum of the first n terms of a geometric sequence with first term a and common ratio r . Let P_n represent the product of these terms. Write P_n in terms of a and r .

Show that the sequence formed by taking the reciprocals of the terms is also geometric. Write R_n , the sum of the first n terms of the reciprocals, in terms of a and r and hence show that

$$\left(\frac{S_n}{R_n}\right)^n = (P_n)^2$$

- 8 Write the first four terms of the series $\sum_{r=0}^{\infty} \frac{(x+1)^r}{3^r}$. For what values of x does this series converge? Evaluate the sum when $x = -1.5$
- 9 An infinite geometric series is such that $S - S_n = ku_n$, $k \in \mathbb{Z}^+$. Find the common ratio and hence show that $S = (k+1)u_1$