Exercise 6I

1 Calculate the value of S_{12} for each geometric series.

   a $0.5 + 1.5 + 4.5 + \cdots$ **b** $0.3 + 0.6 + 1.2 + \cdots$

   c $64 - 32 + 16 - 8 + \cdots$ **d** $(x+1)+(2x+2)+(4x+4)+\cdots$

2 Calculate the value of S_{20} for each series.

   a $0.25 + 0.75 + 2.25 + \cdots$ **b** $\dfrac{16}{9} + \dfrac{8}{3} + 4 + \cdots$

   c $3 - 6 + 12 - 24 + \cdots$ **d** $\log a + \log\left(a^2\right) + \log\left(a^4\right) + \log\left(a^8\right)+\cdots$

EXAM-STYLE QUESTION

3 For each geometric series:

   i find the number of terms

   ii calculate the sum

      a $1024 + 1536 + 2304 + \cdots + 26\,244$

      b $2.7 + 10.8 + 43.2 + \cdots + 2764.8$

      c $\dfrac{125}{128} + \dfrac{25}{64} + \dfrac{5}{32} + \cdots + \dfrac{1}{625}$

      d $590.49 + 196.83 + 65.61 + \cdots + 0.01$

Exercise 6J

1 For each series, determine the least value of n for which $S_n > 400$

   a $25.6 + 38.4 + 57.6 + \cdots$ **b** $14 - 42 + 126 - 378 + \cdots$

   c $\dfrac{2}{3} + \dfrac{8}{9} + \dfrac{32}{27} + \cdots$ **d** $0.02 + 0.2 + 2 + \cdots$

2 A geometric series has third term 1.2 and eighth term 291.6
Find the common ratio and the value of S_{10}.

3 In a geometric series, $S_4 = 20$ and $S_7 = 546.5$
Find the common ratio, if $r > 1$

EXAM-STYLE QUESTION

4 **a** Find the common ratio for the geometric series $\dfrac{1}{12} + \dfrac{1}{8} + \dfrac{3}{16} + \cdots$

   b Hence, find the least value of n such that $S_n > 800$

5 In a geometric series, the sum of the first three terms is 304, and the sum of the first 6 terms is 1330. Find the sum of the first seven terms.

6 In a geometric series, the sum of the first four terms is ten times the sum of the first two terms. If $r > 1$, find the common ratio.