

1 Find the sum of the following series:

- a** $12 + 6 + 3 + 1.5 + \dots$ to 10 terms **b** $\sqrt{7} + 7 + 7\sqrt{7} + 49 + \dots$ to 12 terms
c $6 - 3 + 1\frac{1}{2} - \frac{3}{4} + \dots$ to 15 terms **d** $1 - \frac{1}{\sqrt{2}} + \frac{1}{2} - \frac{1}{2\sqrt{2}} + \dots$ to 20 terms

3 Let S_n be the sum of an infinite geometric sequence such that $S_1 = 3$ and $S_2 = 4$.

- a** State the first term u_1 . **b** Calculate the common ratio r .
c Calculate u_5 .

6 Consider $S_n = \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16} + \dots + \frac{1}{2^n}$.

- a** Find S_1, S_2, S_3, S_4 and S_5 in fractional form.
b From **a** guess the formula for S_n .
c Find S_n using $S_n = \frac{u_1(1 - r^n)}{1 - r}$.
d Comment on S_n as n gets very large.
e What is the relationship between the given diagram and **d**?

