**1** Find the first four terms of each of the following sequences.
  a $t_1 = 5, t_n = t_{n-1} - 2$
  b $t_1 = -3, t_n = 2t_{n-1} - 1$

2 Find the first four terms of each of the following sequences.
  a $t_n = \dfrac{1}{2}n$
  b $t_n = -2n - 3$

3 Find the 15th term of the arithmetic sequence whose fourth term is 12 and seventh term is 27.

4 A boy invites four friends to his 5th birthday party, eight friends to his 6th birthday party, 12 friends to his 7th and so on each year. If this pattern continues, how many friends will he invite to his 18th birthday party?

5 An arithmetic sequence has $t_4 = -20$ and $t_8 = 8$. Find S_{10}.

6 For the arithmetic sequence $-6, 2, 10, \dots$, find $\{n : S_n = 750\}$.

7 The third term of a geometric sequence is 9 and the seventh is 729. Find the fourth term.

8 $2500 is invested at 4.5% p.a. compounded annually.
  a Find the value of the investment after 10 years.
  b Find how long it will take for the original investment to double in value.

9 The first term of a geometric sequence is 4 and the third term is 9. Find the possible values for the second and fourth terms.

10 A ball is dropped from a height of 1.2 m. If each time it bounces, it rebounds to $\dfrac{4}{5}$ of the height of the preceding bounce, what is the total distance travelled by the ball up to the 8th bounce?

11 Given that the equation $x^3 - 5x + 3 = 0$ has a solution close to $x = 2$, use fixed point iteration to find the value of that solution, correct to four decimal places.

12 When the sixth term of a geometric sequence is divided by the third term of the same sequence the result is $\dfrac{-27}{8}$. Given that the first term of this sequence is 7, find the exact value of the sixth term.

13 The diagram shows a square *ABCD* of side length 4 cm. The midpoints *P*, *Q*, *R* and *S* of the sides are joined to form a second square. The midpoints *W*, *X*, *Y* and *Z* of the sides of the square *PQRS* are joined to form a third square as shown.
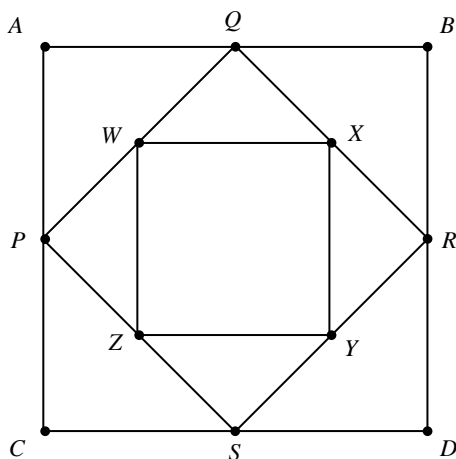
a Show that the areas of the three squares *ABCD*, *PQRS* and *WXYZ* form a geometric sequence and find the common ratio, *r*, of this sequence.

The process of forming smaller and smaller squares (by joining the midpoints) is continued.
b Find the area of the 11th square.
c If the process is continued indefinitely, find the sum of the areas of all the squares.