1 A sequence has nth term $4n + 9$.

(a) Find the first term that is greater than 100, and say which position it is in (2)

(b) Find the first term that is greater than 200 (2)

(4 marks)

2 Rectangles are made from square tiles. Each side of a tile is 2 cm. Rectangle n is n tiles long and 1 tile wide.

(a) Write down the perimeters of rectangles 1, 2 and 3 (1)

(b) Write down the nth term P_n (1)

(c) Find the perimeter of rectangle 15 (1)

(d) A rectangle has perimeter 84 cm. How long is it? (2)

(5 marks)

3 A sequence has nth term $50 - 4n$.

(a) Write down the first four terms (1)

(b) Find the 10th term (1)

(c) Which position holds the term 2? (1)

(d) Find the first term of this sequence that is negative (2)

(5 marks)

4 Two sequences are given: the first has nth term $3n + 4$ and the second has nth term $5n - 6$.

(a) Write down the first four terms of each (2)

(b) Find a number that is a term of both sequences (2)

(c) Which sequence grows faster, and how can you tell from the rules alone? (2)

(6 marks)

5 Look at the sequence $1, 3, 7, 13, 21, \ldots$

(a) Write down the differences between consecutive terms (1)

(b) A pupil uses the method of differences and writes the nth term as $2n - 1$. Work out $2n - 1$ for the first four positions (1)

(c) Explain why the pupil's method does not work here (2)

(d) Write down the next two terms anyway (1)

(5 marks)

6 A machine takes a number in, multiplies it by 4, then adds 3, and puts the answer out.

(a) What comes out if 5 goes in? (1)

(b) What comes out if 10 goes in? (1)

(c) What goes in if 31 comes out? (1)

(d) Write down what the machine does using n for the number that goes in (2)

(e) Where have you seen $4n + 3$ this week? (2)

(7 marks)