REVIEW SET 5C

1 A sequence is defined by $u_n = 68 - 5n$.

a Prove that the sequence is arithmetic. **b** Find u_1 and d.

• Find the 37th term of the sequence.

d State the first term of the sequence which is less than -200.

2 a Show that the sequence 3, 12, 48, 192, is geometric.

b Find u_n and hence find u_9 .

3 Find the general term of the arithmetic sequence with $u_7 = 31$ and $u_{15} = -17$. Hence, find the value of u_{34} .

4 Consider the sequence $24, a, 6, \dots$

Find the value of a if the sequence is: **a** arithmetic **b** geometric.

5 Find the 10th term of the sequence:

a 32, 25, 18, 11, **b** $\frac{1}{81}$, $\frac{1}{27}$, $\frac{1}{9}$, $\frac{1}{3}$,

6 There were originally 3000 koalas on Koala Island. Since then, the population of koalas on the island has increased by 5% each year.

a How many koalas were on the island after 3 years?

b How long will it take for the population to exceed 5000?

7 Find the formula for u_n , the general term of:

a 86, 83, 80, 77, **b** $\frac{3}{4}$, 1, $\frac{7}{6}$, $\frac{9}{7}$,

c 100, 90, 81, 72.9,

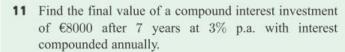
Hint: One of these sequences is neither arithmetic nor geometric.

8 Find the first term of the sequence 5, 10, 20, 40, which exceeds 10 000.

9 -1, k, $k^2 - 7$ are consecutive terms of an arithmetic sequence. Find k.

10 Each year, a school manages to use only 90% as much paper as the previous year. In the year 2000, they used 700 000 sheets of paper.

- **a** Find how much paper the school used in the years 2001 and 2002.
- **b** How much paper did the school use in total in the decade from 2000 to 2009?





- 12 Ned would like to have £15 000 in 3 years' time to install a swimming pool. His bank pays 4.5% p.a. interest, compounded half-yearly. How much does Ned need to deposit now?
- 13 A motorbike, purchased for £2300, was sold for £1300 after 4 years. Calculate the average annual rate of depreciation.

ANSWERS

REVIEW SET 5C

- 1 **b** $u_1 = 63$, d = -5 **c** $u_{37} = -117$ **d** $u_{54} = -202$
- **2 b** $u_n = 3 \times 4^{n-1}$, $u_9 = 196608$
- $u_n = 73 6n, \ u_{34} = -131$
- **4 a** a = 15 **b** a = 12 or -12
- 5 **a** $u_{10} = -31$ **b** $u_{10} = 243$
- **6 a** ≈ 3470 **b** 11 years
- 7 **a** $u_n = 89 3n$ **b** $u_n = \frac{2n+1}{n+3}$
 - $u_n = 100 \times (0.9)^{n-1}$
- 8 $u_{12} = 10240$ 9 k = -2 or 4
- **10 a** 2001: 630 000, 2002: 567 000 **b** $\approx 4560\,000$ sheets
- **11** €9838.99 **12** £13125.36 **13** $\approx -13.3\%$