

REVIEW SET 5B

- 1 A sequence is defined by $u_n = 6\left(\frac{1}{2}\right)^{n-1}$.
- Prove that the sequence is geometric.
 - Find u_1 and r .
 - Find the 16th term to 3 significant figures.
- 2 Consider the sequence $24, 23\frac{1}{4}, 22\frac{1}{2}, \dots, -36$. Find:
- the number of terms in the sequence.
 - the value of u_{35} for the sequence.
 - the sum of the terms in the sequence.
- 3 Find the sum of:
- $3 + 9 + 15 + 21 + \dots$ to 23 terms
 - $24 + 12 + 6 + 3 + \dots$ to 12 terms.
- 4 List the first five terms of the sequence:
- $\left\{\left(\frac{1}{3}\right)^n\right\}$
 - $\{12 + 5n\}$
 - $\left\{\frac{4}{n+2}\right\}$
- 5
- What will an investment of €6000 at 7% p.a. compound interest amount to after 5 years?
 - What part of this is interest?
- 6 Find the first term of the sequence $24, 8, \frac{8}{3}, \frac{8}{9}, \dots$ which is less than 0.001.
- 7 A geometric sequence has $u_6 = 24$ and $u_{11} = 768$.
- Determine the general term of the sequence.
 - Hence find u_{17} .
 - Find the sum of the first 15 terms.
- 8 The n th term of a sequence is given by the formula $u_n = 4n - 7$.
- Find the value of u_{10} .
 - Write down an expression for $u_{n+1} - u_n$ and simplify it.
 - Hence explain why the sequence is arithmetic.
 - Evaluate $u_{15} + u_{16} + u_{17} + \dots + u_{30}$.
- 9
- Determine the number of terms in the sequence $128, 64, 32, 16, \dots, \frac{1}{512}$.
 - Find the sum of these terms.
- 10 For the geometric sequence $180, 60, 20, \dots$, find:
- the common ratio for this sequence.
 - the 6th term of the sequence.
 - the least number of terms required for the sum of the terms to exceed 269.9.
- 11 Before leaving overseas on a three year trip to India, I leave a sum of money in an account that pays 6% p.a. compounded half-yearly. When I return from the trip, there is €5970.26 in my account. How much interest has been added since I have been away?
- 12 Megan deposits £3700 in an account paying interest compounded monthly for two years. If she ends up with £4072, what rate of interest did Megan receive?
- 13 Kania purchases office equipment valued at \$17 500.
- At the end of the first year, the value of the equipment is \$15 312.50. Find the rate of depreciation.
 - If the value of the equipment continued to depreciate at the same rate, what would it be worth after $3\frac{1}{2}$ years?

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- 1** **b** $u_1 = 6, r = \frac{1}{2}$ **c** 0.000 183
- 2** **a** 81 **b** $u_{35} = -1\frac{1}{2}$ **c** -486 **3** **a** 1587 **b** $47\frac{253}{256}$
- 4** **a** $\frac{1}{3}, \frac{1}{9}, \frac{1}{27}, \frac{1}{81}, \frac{1}{243}$ **b** 17, 22, 27, 32, 37
c $\frac{4}{3}, 1, \frac{4}{5}, \frac{2}{3}, \frac{4}{7}$
- 5** **a** €8415.31 **b** €2415.31 **6** $u_{11} \approx 0.000\ 406$
- 7** **a** $u_n = (\frac{3}{4})2^{n-1}$ **b** 49 152 **c** $24\ 575\frac{1}{4}$
- 8** **a** 33 **b** $4(n+1) - 7 - (4n - 7) = 4$
c The difference between terms is always the same. **d** 1328
- 9** **a** 17 terms **b** $255\frac{511}{512}$
- 10** **a** $r = \frac{1}{3}$ **b** $u_6 = \frac{20}{27}$ **c** $n = 8$ **11** €970.26
- 12** 4.80% p.a. **13** **a** 12.5% per year **b** \$10 966.45