



QUESTION WORKBOOK

Geometric series

Sequences and series · Year 12–13

7 questions · 21 marks

NAVY SCREEN EDITION

SECTION A · Warm-up

A1 A geometric sequence begins 2, 6, 18, ... Find the common ratio and the 8th term. [2]

A2 State the condition under which a geometric series has a sum to infinity, and determine which of the ratios 0.8, 1.2 and -0.5 qualify. [2]

SECTION B · Standard

B1 Find the sum of the first 12 terms of the series $5 + 10 + 20 + \dots$ [3]

B2 Find the sum to infinity of the series $24 + 18 + 13.5 + \dots$ [3]

- B3** Prove the formula $S_n = a(1 - r^n)/(1 - r)$ for the sum of the first n terms of a geometric series. [4]

- B4** A deposit of £2000 grows by 6% each year, with interest added at the end of each year. Show that the balance first exceeds £3000 after 7 years. [4]

SECTION C · Stretch

- C1** Use a geometric series to write the recurring decimal $0.727272\dots$ as a fraction in lowest terms. [3]