

(17) Geometric Series. The Sum to Infinity

WORKING AT D/E

(1) Circle which ones of the following series are convergent.

2, 4, 8, 16..... 10, 5, 2.5, 1.25... $\frac{1}{4}, \frac{1}{8}, \frac{1}{16}, \frac{1}{32}, \dots$

(2) Find the sum to infinity of each of the geometric series below

(a) 8, 4, 2, 1.....

(b) $a = 14, r = 0.1$

(3) The sum to infinity of a series with first term 12 is 40.

(a) Find the common ratio

(b) Find the 6th term.

(c) Find the sum of the first 4 terms.

WORKING AT B/C

(1) A geometric series has first term 10 and third term 6.4. Find the sum to infinity of the series,

(2) The first 3 terms of a geometric series are $p, 2p$ and $4p$ where p is a constant,

(a) Explain why it is not possible to find the sum to infinity for the series.

Given that p is actually 1.84,

(b) Find the sum of the first 8 terms of the series.

(c) Given that the n th term in the sequence is the first to exceed 100, find the value of n

(3) In a geometric series $S_{\infty} = 50$ and the second term is 12.

(a) Show, using the formula book, that

$$50(1 - r)r = 12$$

(b) Hence, find the 2 possible values of r

WORKING AT A*/A

(1) The 5th term of a geometric series is 0.01 and the 8th term is -0.00001

Find the sum to infinity of the series,

(2) A geometric series has first 3 terms $4p, p - 0.8$ and $\frac{4}{25}p$ where p is a constant.

Given that $S_{\infty} = 20$ and all the terms in the series are positive, find the value of p .