INFINITE GEOMETRIC SERIES:

A bouncy ball is dropped straight down from a height of 1.5 metres. With each bounce, it rebounds 75% of its height. What is the total distance it travels until it comes to rest?

$$|r|<1$$

$$-1<r<1$$

Decide whether the infinite geometric series below are converging, and if so, find the sum:

a $20+10+5+\cdots$ **b** $\frac{1}{3}+\frac{2}{3}+\frac{4}{3}+\cdots$ **c** $\frac{1}{4}-\frac{1}{8}+\frac{1}{16}+\cdots$ **d** $\sum_{k=1}^{\infty}-2\left(\frac{-1}{3}\right)^{n}$

Sums of Series – Mixed Problems

For an arithmetic series, $S_n = -126$, $u_1 = -1$ and $u_n = -20$. Find the value of n.

The second term of an arithmetic sequence is 7. The sum of the first four terms is 12. Find the first term and the common difference.

In a geometric series, the sum of the first three terms is 304, and the sum of the first 6 terms is 1330. Find the sum of the first seven terms.

For the series $3 + 9 + 27 + \ldots$, what is the minimum number of terms needed for the sum to exceed 1000?

The sum of the first three terms of a geometric series is 148, and the sum to infinity is 256.
Find the first term and the common ratio of the series.