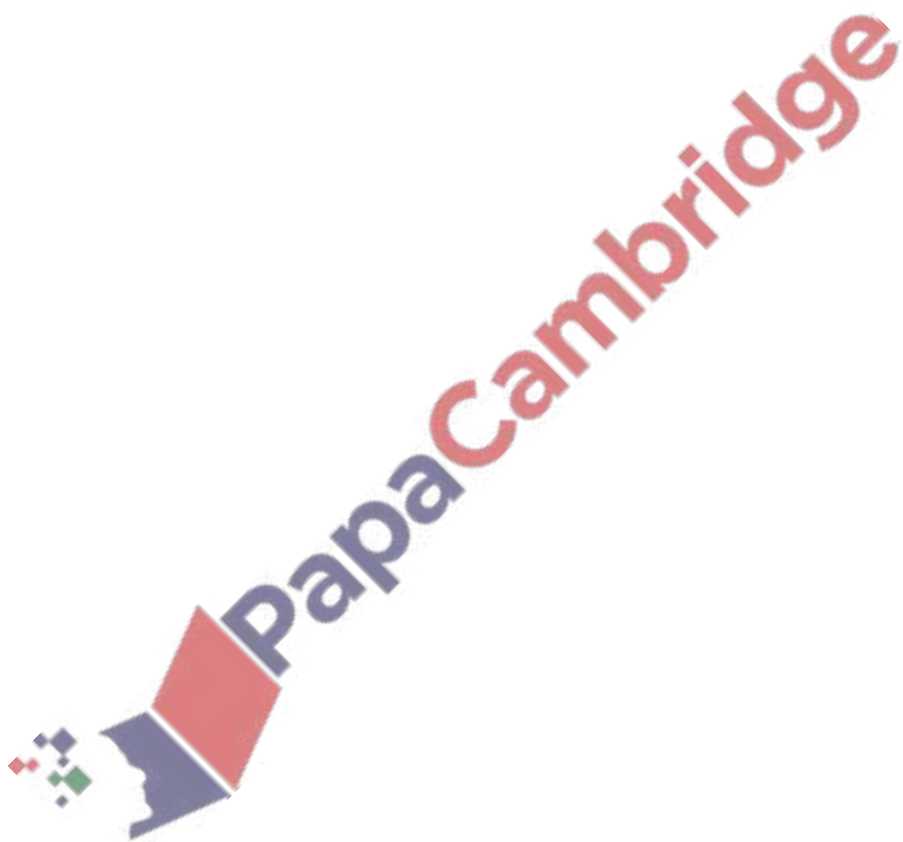


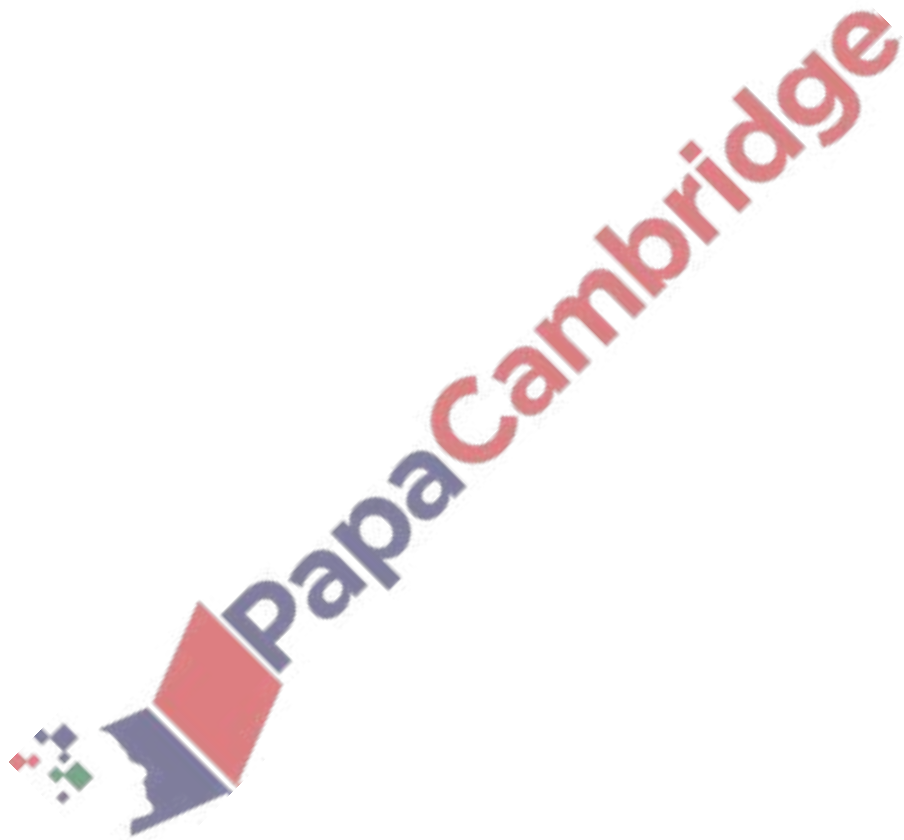
1. **June/2022/Paper_11/No.7**

- (a) The first three terms of an arithmetic progression are $\lg 3$, $3 \lg 3$, $5 \lg 3$. Given that the sum to n terms of this progression can be written as $256 \lg 81$, find the value of n . [5]



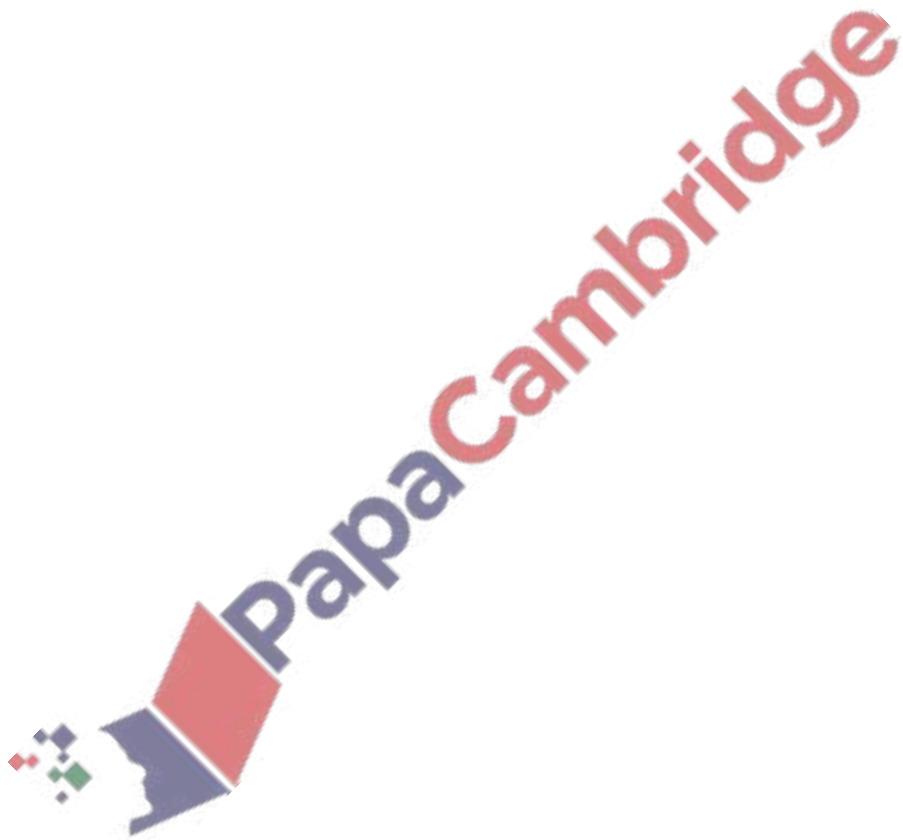
(b) **DO NOT USE A CALCULATOR IN THIS PART OF THE QUESTION.**

The first three terms of a geometric progression are $\ln 256$, $\ln 16$, $\ln 4$. Find the sum to infinity of this progression, giving your answer in the form $p \ln 2$. [4]



2. June/2022/Paper_12/No.5

The first three terms, in ascending powers of x , in the expansion of $\left(1 + \frac{x}{6}\right)^{12} (2 - 3x)^3$ can be written in the form $8 + px + qx^2$, where p and q are constants. Find the values of p and q . [8]



3. June/2022/Paper_21/No.5

- (a) (i) Write down, in ascending powers of x , the first three terms in the expansion of $(1 + 4x)^n$.
Simplify each term. [2]

- (ii) In the expansion of $(1 + 4x)^n(1 - 4x)$ the coefficient of x^2 is 6032. Given that $n > 0$, find the value of n . [3]

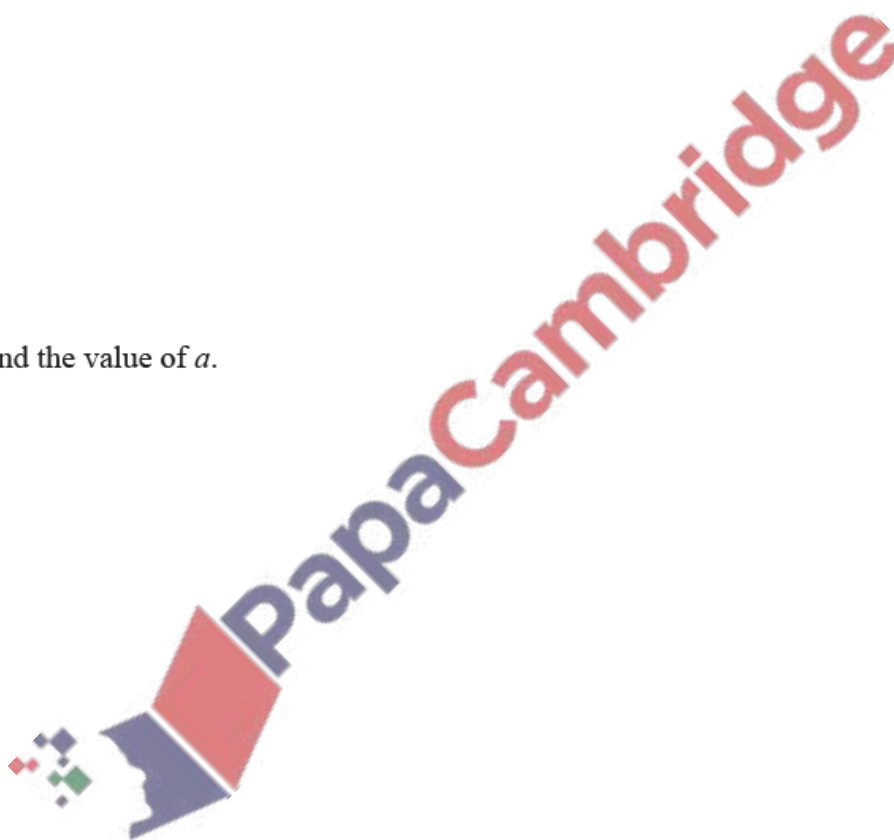
- (b) Find the term independent of x in the expansion of $\left(\frac{x}{2} - \frac{8}{x^4}\right)^{10}$. [2]

4. June/2022/Paper_22/No.10

(a) A geometric progression has first term a and common ratio r , where $r > 0$. The second term of this progression is 8. The sum of the third and fourth terms is 160.

(i) Show that r satisfies the equation $r^2 + r - 20 = 0$. [4]

(ii) Find the value of a . [3]



(b) An arithmetic progression has first term p and common difference 2. The q th term of this progression is 14.

A different arithmetic progression has first term p and common difference 4. The sum of the first q terms of this progression is 168.

Find the values of p and q .

[6]

