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 qth 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]