

IB MATH AA SL PRACTICE
EXAM-II

Most Common Ib Exam
10 QUESTIONS

[Maximum mark: 5]



Find the values of x when $25^{x^2-2x} = \left(\frac{1}{125}\right)^{4x+2}$.

[Maximum mark: 5]



The third term of an arithmetic sequence is equal to 7 and the sum of the first 8 terms is 20.

Find the common difference and the first term.

[Maximum mark: 6]



The sum of the first three terms of a geometric sequence is 81.3, and the sum of the infinite sequence is 300. Find the common ratio.

[Maximum mark: 6]



Consider the expansion of $\left(x^3 + \frac{2}{x}\right)^8$.

(a) Write down the number of terms in this expansion.

[1]

(b) Find the coefficient of the term in x^4 .

[5]

[Maximum mark: 6]



The 1st, 5th and 13th terms of an arithmetic sequence, with common difference d , $d \neq 0$, are the first three terms of a geometric sequence, with common ratio r , $r \neq 1$. Given that the 1st term of both sequences is 12, find the value of d and the value of r .

[Maximum mark: 6]



Consider the expansion of $\left(3x + \frac{p}{x}\right)^8$, where $p > 0$. The coefficient of the term in x^4 is equal to the coefficient of the term in x^6 . Find p .

[Maximum mark: 8]



It is known that the number of trees in a small forest will decrease by 5% each year unless some new trees are planted. At the end of each year, 600 new trees are planted to the forest. At the start of 2021, there are 8200 trees in the forest.

- (a) Show that there will be roughly 9060 trees in the forest at the start of 2026. [4]
- (b) Find the approximate number of trees in the forest at the start of 2041. [4]

[Maximum mark: 14]



The first two terms of an infinite geometric sequence, in order, are

$$3 \log_3 x, 2 \log_3 x, \text{ where } x > 0.$$

- (a) Find the common ratio, r . [2]
- (b) Show that the sum of the infinite sequence is $9 \log_3 x$. [3]

The first three terms of an arithmetic sequence, in order, are

$$\log_3 x, \log_3 \frac{x}{3}, \log_3 \frac{x}{9}, \text{ where } x > 0.$$

- (c) Find the common difference d , giving your answer as an integer. [3]

Let S_6 be the sum of the first 6 terms of the arithmetic sequence.

- (d) Show that $S_6 = 6 \log_3 x - 15$. [3]
- (e) Given that S_6 is equal to one third of the sum of the infinite geometric sequence, find x , giving your answer in the form a^p where $a, p \in \mathbb{Z}$. [3]

[Maximum mark: 15]



The first three terms of an infinite geometric sequence are $k - 4$, 4 , $k + 2$, where $k \in \mathbb{Z}$.

- (a) (i) Write down an expression for the common ratio, r .
- (ii) Hence show that k satisfies the equation $k^2 - 2k - 24 = 0$. [5]
- (b) (i) Find the possible values for k .
- (ii) Find the possible values for r . [5]
- (c) The geometric sequence has an infinite sum.
- (i) Which value of r leads to this sum. Justify your answer.
- (ii) Find the sum of the sequence. [5]

[Maximum mark: 7]



Given that $(5 + nx)^2 \left(1 + \frac{3}{5}x\right)^n = 25 + 100x + \dots$, find the value of n .