

HL AA mixed prep 4

Please solve on extra paper!

1. Polynomial division

Given are the polynomials $f(x) = 2x^4 + 3x^3 + 5x^2 - 13$ and $g(x) = 2x^2 + x - 2$.

Divide $f(x)$ by $g(x)$ and show that $f(x) = h(x) \times g(x) - x - 7$.

State the polynomial $h(x)$.

[4]

2. The mean of the first ten terms of an arithmetic sequence is 6. The mean of the first twenty terms of the arithmetic sequence is 16. Find the value of the 15th term of the sequence.

(Total 6 marks)

3. An arithmetic sequence has 5 and 13 as its first two terms respectively.

- (a) Write down, in terms of n , an expression for the n th term, a_n .
- (b) Find the number of terms of the sequence which are less than 400.

(Total 4 marks)

4. Simplify

$$\frac{4x^2(-y^{-1})^{-2}}{(-2x^2)^3(y^{-2})^2}$$

[3]

5. Solve for x

$$9^x + 4(3^x) - 12 = 0$$

[4]

6.

The polynomial $x^2 - 5x + 6$ is a factor of $2x^3 - 15x^2 + ax + b$. Find the values of a and b .

[4]