HL AA mixed prep 1
Please solve on extra paper!

1. Solve

$$log_3 x + log_9 x = 12$$ [3]

2.

The polynomial $P(x) = 2x^3 + ax^2 - 4x + b$ is divisible by $(x-1)$ and by $(x+3)$. Find the value of a and of b.

(Total 6 marks)

3. The polynomial $f(x) = x^3 + 3x^2 + ax + b$ leaves the same remainder when divided by $(x-2)$ as when divided by $(x+1)$.

Find the value of a.

(Total 3 marks)

4. When the function $f(x) = 6x^4 + 11x^3 - 22x^2 + ax + 6$ is divided by $(x+1)$ the remainder is -20. Find the value of a.

(Total 4 marks)

5. Given x and y are both positive , solve the simultaneous equations

$$log\ xy = 7$$
$$log\left(\frac{x}{y}\right) = 1$$ [4]

6.

Prove that if $x^3 + mx + n$ is divisible by $(x-k)^2$, then $\left(\frac{m}{3}\right)^3 + \left(\frac{n}{2}\right)^2 = 0$

Hint : Use compare coefficients method.

[5]