Logs and Exponentials Prep

NON CALCULATOR

1. Write $\ln (x^2 - 1) - 2\ln(x + 1) + \ln(x^2 + x)$ as a single logarithm, in its simplest form.

(Total 5 marks)

2. Solve the equation $\log_3(x + 17) - 2 = \log_3 2x$.

(Total 5 marks)

3. Given that $4\ln 2 - 3\ln 4 = -\ln k$, find the value of k.

(Total 5 marks)

4. Solve the equation $\log_9 81 + \log_9 \frac{1}{9} + \log_9 3 = \log_9 x$.

(Total 4 marks)

5. Solve the equation $9^{x-1} = \left(\frac{1}{3}\right)^{2x}$.

(Total 6 marks)

6. Let $a = \log x$, $b = \log y$, and $c = \log z$.

Write $\log\left(\frac{x^2\sqrt{y}}{z^3}\right)$ in terms of a, b and c.

(Total 6 marks)

7.

Solve the equation $9\log_5 x = 25\log_x 5$, expressing your answers in the form $5^{\frac{p}{q}}$, where $p, q \in \mathbb{Z}$.

(Total 6 marks)

8. Solve $2(5^{x+1}) = 1 + \frac{3}{5^x}$, giving the answer in the form $a + \log_5 b$, where $a, b \in \mathbb{Z}$.

(Total 6 marks)

TOTAL: 43