Logarithm and Exponential Functions – 2021 A2

1. June/2021/Paper_9709/31/No.2

Find the real root of the equation $\frac{2e^x + e^{-x}}{2 + e^x} = 3$, giving your answer correct to 3 decimal places. Your working should show clearly that the equation has only one real root. [5]

2. June/2021/Paper_9709/32/No.3

The variables x and y satisfy the equation $x = A(3^{-y})$, where A is a constant.

(a) Explain why the graph of y against $\ln x$ is a straight line and state the exact value of the gradient of the line. [3]

It is given that the line intersects the y-axis at the point where $y = 1.3$.

(b) Calculate the value of A, giving your answer correct to 2 decimal places. [2]

3. June/2021/Paper_9709/33/No.2

Solve the equation $4^x = 3 + 4^{-x}$. Give your answer correct to 3 decimal places. [5]

4. March/2021/Paper_9709/32/No.1

Solve the equation $\ln(x^3 - 3) = 3\ln x - \ln 3$. Give your answer correct to 3 significant figures. [3]