

Logarithmic and Exponential Functions 2



Q1.

Solve the equation

$$\ln(3x + 4) = 2\ln(x + 1),$$

giving your answer correct to 3 significant figures.

[4]

Q2.

Solve the equation $\ln(2x + 3) = 2\ln x + \ln 3$, giving your answer correct to 3 significant figures. [4]

Q3.

Solve the equation

$$5^{x-1} = 5^x - 5,$$

giving your answer correct to 3 significant figures.

[4]

Q4.

Solve the equation

$$\ln(x + 5) = 1 + \ln x,$$

giving your answer in terms of e.

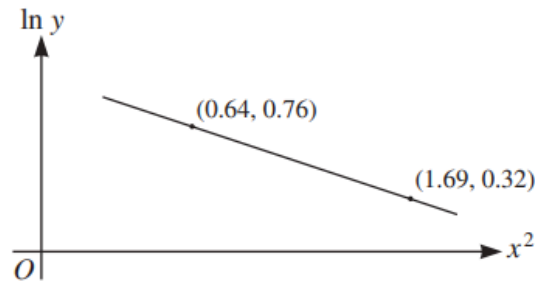
[3]

Q5.

(i) Solve the equation $|4x - 1| = |x - 3|$. [3]

(ii) Hence solve the equation $|4^{y+1} - 1| = |4^y - 3|$ correct to 3 significant figures. [3]

Q6.



The variables x and y satisfy the equation $y = Ae^{-kx^2}$, where A and k are constants. The graph of $\ln y$ against x^2 is a straight line passing through the points $(0.64, 0.76)$ and $(1.69, 0.32)$, as shown in the diagram. Find the values of A and k correct to 2 decimal places. [5]

Q7.

It is given that $\ln(y + 1) - \ln y = 1 + 3 \ln x$. Express y in terms of x , in a form not involving logarithms. [4]

Q8.

Solve the equation $2|3^x - 1| = 3^x$, giving your answers correct to 3 significant figures. [4]

Q9.

Given that $2 \ln(x + 4) - \ln x = \ln(x + a)$, express x in terms of a . [4]

Q10.

It is given that $2 \ln(4x - 5) + \ln(x + 1) = 3 \ln 3$.

- (i) Show that $16x^3 - 24x^2 - 15x - 2 = 0$. [3]
- (ii) By first using the factor theorem, factorise $16x^3 - 24x^2 - 15x - 2$ completely. [4]
- (iii) Hence solve the equation $2 \ln(4x - 5) + \ln(x + 1) = 3 \ln 3$. [1]