

1. March/2023/Paper_9709/32/No.1

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

Express y in terms of x .

[3]

Using the laws of logarithms $\ln A - \ln B = \ln\left(\frac{A}{B}\right)$

$$x = \ln\left(\frac{2y - 3}{y + 4}\right)$$

Introduce exponential on both sides.

$$e^x = e^{\ln\left(\frac{2y - 3}{y + 4}\right)}$$

$$e^x = \frac{2y - 3}{y + 4}$$

$$e^x (y + 4) = 2y - 3$$

$$ye^x + 4e^x = 2y - 3$$

$$4e^x + 3 = 2y - ye^x$$

$$4e^x + 3 = y \frac{2 - e^x}{2 - e^x}$$

$$\therefore y = \frac{4e^x + 3}{2 - e^x}$$