Cambridge International AS & A Level

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Mathematics 9709/32

Paper 3 Pure Mathematics 3 **May/June 2023**

Question No (2)

2 Solve the equation $\ln(2x^2 - 3) = 2\ln x - \ln 2$, giving your answer in an exact form.

Solution:

$\ln(2x^2-3) = 2\ln x - \ln 2$

Formula for ln

① $\ln(x/y) = \ln x - \ln y$

② $\ln x^n = n \ln x$

$\ln(2x^2-3) = \ln x^2 - \ln 2$

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

$\Rightarrow 2x^2-3 = \frac{x^2}{2}$ Removing ln

$\therefore e^{\ln} = 1$

$2(2x^2-3) = x^2$

$4x^2-6 = x^2$

$4x^2 - x^2 = 6$

$3x^2 = 6$

$x^2 = 2$

$x = \sqrt{2}$

$-\sqrt{2}$ is undefine in ln.