

Aim: How do we solve exponential and logarithmic equations involving e ?

I. Do Now:

1. Fill in the blanks:

i) $\log_b 1 = 0 \Rightarrow \ln 1 = \underline{\hspace{2cm}}$

ii) $\log_b b = 1 \Rightarrow \ln e = \underline{\hspace{2cm}}$

iii) $\log_b (b^x) = x \Rightarrow \ln e^x = \underline{\hspace{2cm}}$

iv) $10^{\log x} = x \Rightarrow e^{\ln x} = \underline{\hspace{2cm}}$

3. Solve for x :

$$\ln x - \ln \sqrt{x} = 4$$

4. Solve for x :

$$2e^{-4x} + 3 = 17$$

2. Condense and simplify:

$$\ln x^5 - \ln \sqrt[3]{2x} + \ln \left(\frac{3}{x}\right)$$

II. Solve for x :

5. $-3e^{5x+1} - 7 = -91$

6. $\ln \sqrt{x+3} = -1$

7. $e^{2x} - 3e^x + 2 = 0$

8. $e^{2\ln x} = 25$

9. $e^{2\ln x} = 5$

10. $2 - \ln(3-x) = 0$

11. $e^{4x} + 4e^{2x} - 21 = 0$

12. $e^{3x} = 3^{x+1}$

13. $\ln(\log x) = 2$

14. $\ln(x+1) - 1 = \ln(x-1)$

15. $\ln(3x+1) - \ln(x+2) = 5$

16. $2\ln(x+1) + \ln 5 = \ln 7$

17. $e^{4\ln x} = \ln e^8$

18. $\ln x + \ln 3 = 6$

19. $e^{\ln(\log x)} = 2$