

Homework to review

Here are some rules of logarithms that will be helpful for you to recall:

$$\ln A + \ln B = \ln AB \quad \ln A - \ln B = \ln \frac{A}{B} \quad -\ln A = \ln \frac{1}{A} \quad 2 \ln A = \ln A^2 \\ n \ln A = \ln A^n \quad e^{\ln A} = A \quad e^{n \ln A} = A^n \quad \frac{\ln A}{\ln B} = \log_B A \quad \ln e = 1 \quad \ln 1 = 0$$

Use these to simplify the following without a calculator:

1. $\ln 9 - \ln 3$
2. $\ln x^3 - \ln x$
3. $\ln x^2 - \ln y^2 + \ln z^2 - \ln z^3$
4. $e^{\ln x^3} - e^{\ln x}$
5. $\ln e^{x^3} - \ln e^x$
6. $e^{4 \ln x} - e^{\frac{1}{4} \ln x}$

Solve for y :

1. $y + 4 = t - 4$
2. $y^2 + 4 = t - 4$
3. $y + 4y = t - 5$
4. $y^2 + 4y = t - 4$
5. $\frac{y+4}{y} = t^2 - 1$
6. $\frac{y}{y-1} = t^2 + 1$
7. $\frac{1}{y^2} = t^2$
8. $\frac{1}{y^2-4} = t^2 - 1$
9. $\frac{1}{y^2-4y} = t^2 - 1$
10. $\frac{1}{y^2-3y} = t - \frac{1}{t}$
11. $\ln y = -\ln t$
12. $\ln y = -t$
13. $\ln y = -\ln t + \ln 3t$
14. $\ln y = -\ln t + \ln 3t^2$
15. $\ln y = t^2$
16. $\ln y - \ln y + 1 = t^2$

17. $\ln y + \ln y + 1 = -t^2$

18. $\ln y - 1 - \ln y + 1 = \ln t$

19. $\ln 3y - \ln y + 3 = \ln t$