In Problems 1-10, use properties of logarithms to expand each logarithmic expression as much as possible. Where possible, evaluate logarithmic expressions without using a calculator

1. $\log_3 2 + \log_3 x$	2. $2 + \log x$
3. $3 - \ln 7$	4. $3\log(x-2)$
5. $8\log x + 2\log y - 3\log z$	6. $2 + \dfrac{1}{2}\log_3 x - \log_3 y$
7. $2\ln(x-3) + \dfrac{1}{2}\ln(x-7) - \ln 4 - 5\ln(x+1)$	8. $\ln x + \dfrac{1}{2}\ln y - \dfrac{3}{2}\ln z - 2\ln w$
9. $\log(x-7) + 5\log(x+3)$	10. $\dfrac{1}{5}\log_5(x-3) + 2\log_5(x+5) - 2$

In Problems 11-18, use properties of logarithms to condense each logarithmic expression. Write the expression as a single logarithm whose coefficient is 1. Where possible, evaluate logarithmic expressions without using a calculator

11. 4	12. 1
13. $\log\!\left(x^4 y^5\right)$	14. $\log \dfrac{x^7}{y^3 z^5}$
15. $\log \sqrt[3]{\dfrac{x^4}{y^8}}$	16. $\ln \dfrac{x^7 \sqrt{y}}{z^2}$
17. $\log \dfrac{\sqrt[5]{\dfrac{x}{y^3}}}{\sqrt{\dfrac{x^2}{y}}}$	18. $\ln \dfrac{(x-3)(x-7)}{x+3}$

In Problems 19-20, use common logarithms or natural logarithms and a calculator to evaluate to four decimal places

19. 2.322	20. 2.044

In Problem 21, use a graphing utility and the change-of-base property to graph each function

21.	