Always do the terminology fill-in-the-blank questions at the beginning of each homework section. This section, they are the first 4 questions. This is apparently not the last time I'm telling you.

Simplify

5. $e^{\ln\left(\sqrt{y}\right)}$

6. $10^{\log(3x+1)}$

7. $\log\left(10^{\log(3x+1)}\right)$

8. $\ln\left(e^{2k}\right)$

9. $7^{\log_7(999)}$

10. $\log_4\left(4^{150}\right)$

Write as a single logarithm.

11. $\ln\left(x^8\right) - \ln\left(x^3\right)$

Re-write as a sum or difference of multiples of (simpler) logarithms.

12. $\log\left(3\sqrt{x}\right)$

13. $\log\left(3 \cdot 2^k\right)$

14. $\ln\left(\dfrac{\sqrt[3]{xy}}{t^{4/3}}\right)$

15. $\ln\left(\dfrac{6\sqrt{x-1}}{5x^3}\right)$

Re-write as a single logarithm.

16. $\log_2(5) + 3\log_2(x)$

17. $3\log_4\left(\left(x^2\right)^8\right) - \log_4\left(x^{-3}\right) + 2\log_4(x)$

Find each log to 4 decimal places

18. $\log_4(9)$

19. $\log_{1/2}(12)$

Solve. Round final answer to 4 decimal places. If you're rounding to 4 places before the final answer, you're doing it wrong. We want to avoid roundoff error, to the practical extent possible.

20. $(1.0001)^{365t} = 3.5$

21. $(1+r)^3 = 2.3$

22. In 1960, $0.49 was put in the bank, and in the year 20000, it had grown to $4.59. Find the annual growth rate (i.e., interest rate), if interest is compounded annually.

23. Same question, but assume interest is compounded continuously.