

1. $\frac{1}{2} [\ln x + \ln(x - 1) - \ln(x^2 + 2)]$

2. $\log_5 \frac{(x+1)\sqrt{2x+1}}{(x-4)^3}$

3. 1

4. $\frac{\log 0.3}{\log 2} \approx -1.7370$

Challenge: See solutions.

5. $3 \log_3 x - 1 - \log_3(y - 1) - 2 \log_3(z + 2)$

6. $\frac{1}{2} \ln(2x - 3) - \ln(x - 2)$

7. $\frac{1}{2} [1 + \log(x + 2) + \log(x - 3) - 7 \log(x + 1)]$

8. $5 + \frac{1}{3} \ln x + \ln(2x + 1) + \ln(x - 5)$

9. $\ln \frac{x^2(x+1)}{\sqrt{3x-1}(7-x)^5}$

10. $\ln \frac{x^2(x+1)}{x-2}$

11. $\ln \frac{1}{(x+1)^3(x-1)\sqrt{x^2+1}}$

12. $\log_2 \frac{25(x-1)^3 x^6}{9(x+2)^4}$

13. $\log_4 \frac{(x-3)^5 \sqrt{1-3x}}{(x+3)\sqrt{x^2+4}}$

14. 1

15. 12

16. 6

17. $\frac{\ln e}{\ln 2} \approx 1.4427$

18. $\frac{\log 7}{\log 5} \approx 1.2091$