

$$\begin{aligned}
10. \quad & \ln \sqrt{\frac{x+3}{x^2}} \\
&= \ln \left(\frac{x+3}{x^2} \right)^{\frac{1}{2}} \\
&= \frac{1}{2} \ln \left(\frac{x+3}{x^2} \right) \\
&= \frac{1}{2} \ln(x+3) - \frac{1}{2} \ln x^2 \\
&= \frac{1}{2} \ln(x+3) - \frac{1}{2} \cdot 2 \ln x \\
&= \left(\frac{1}{2} \ln(x+3) - \ln x \right)
\end{aligned}$$

$$\begin{aligned}
11. \quad & \ln x + \ln y \\
&= \ln(xy)
\end{aligned}$$

$$\begin{aligned}
12. \quad & 5 \ln x - 7 \ln y + 3 \ln z \\
&= \ln x^5 - \ln y^7 + \ln z^3 \\
&= \ln \frac{x^5}{y^7} + \ln z^3 \\
&= \ln \frac{x^5 z^3}{y^7}
\end{aligned}$$

$$\begin{aligned}
13. \quad & \frac{1}{5} [3 \ln(x-2) + 5 \ln(x-4)] \\
&= \frac{1}{5} [\ln(x-2)^3 + \ln(x-4)^5] \\
&= \frac{1}{5} \ln [(x-2)^3 (x-4)^5] \\
&= \ln [(x-2)^3 (x-4)^5]^{\frac{1}{5}} \\
&= \ln [(x-2)^3]^{\frac{1}{5}} [(x-4)^5]^{\frac{1}{5}} \\
&= \ln \left[\sqrt[5]{(x-2)^3 (x-4)} \right]
\end{aligned}$$

$$\begin{aligned}
14. \quad & \frac{3}{5} [\ln(x-1) - \ln(x+3) - \ln(x-7)] \\
&= \frac{3}{5} \left[\ln \frac{x-1}{x+3} - \ln(x-7) \right] \\
&= \frac{3}{5} \ln \frac{x-1}{(x+3)(x-7)} \\
&= \ln \left[\frac{x-1}{(x+3)(x-7)} \right]^{\frac{3}{5}}
\end{aligned}$$