

$$\begin{aligned}
y &= (4x + 3)^4(x + 1)^{-3} \\
&= (4x + 3)^4 - \left(-3(x + 1)^{-4} \frac{d}{dx} [x + 1] \right) + (x + 1)^{-3} \frac{d}{dx} [(4x + 3)^4] \\
&= (4x + 3)^4 \left(-3(x + 1)^{-4} \right) + (x + 1)^{-3} \left(4(4x + 3)^3 \frac{d}{dx} [4x + 3] \right) \\
&= \frac{(4x + 3)^3 \frac{d}{dx} (4x + 7)}{(x + 1)^4}
\end{aligned}$$