$$y = (4x + 3)^4(x + 1)^{-3}$$

$$= (4x + 3)^4 - \left(-3(x + 1)^{-4}\frac{\mathrm{d}}{\mathrm{d}x}[x + 1]\right) + (x + 1)^{-3}\frac{\mathrm{d}}{\mathrm{d}x}\left[(4x + 3)^4\right]$$

$$= (4x + 3)^4\left(-3(x + 1)^{-4}\right) + (x + 1)^{-3}\left(4(4x + 3)^3\frac{\mathrm{d}}{\mathrm{d}x}[4x + 3]\right)$$

$$= \frac{(4x + 3)^3\frac{\mathrm{d}}{\mathrm{d}x}(4x + 7)}{(x + 1)^4}$$