

$$\int e^x (e^x + 5)^8 dx = \left[\begin{matrix} t = e^x + 5 \\ \frac{dt}{dx} = e^x & dt = e^x dx \end{matrix} \right] = \int t^8 dt = \frac{t^9}{9} + C = \frac{(e^x + 5)^9}{9} + C$$