

$$\frac{dy}{dx} + y = \frac{1}{1+e^x}$$

$$y' + p(x)y = q(x)$$

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$$\text{الحل: } y = \left[C + \int q(x) e^{\int p(x) dx} dx \right] e^{-\int p(x) dx}$$

$$P_{(x)} = 1 \quad , \quad Q_{(x)} = \frac{1}{1+e^x}$$

$$y_{(x)} = \left[C + \int \frac{1}{1+e^x} \cdot e^{\int dx} dx \right] e^{-\int dx}$$

$$y_{(x)} = \left[C + \int \frac{1}{1+e^x} \cdot e^x dx \right] e^{-x}$$

$$y_{(x)} = [C + \ln(1+e^x)] e^{-x}$$

$$y_{(x)} = \frac{C + \ln(1+e^x)}{e^x}$$