

$$y' = 6x + 7y \Rightarrow y' - 7y = 6x. \quad I(x) = e^{\int P(x) dx} = e^{\int (-7) dx} = e^{-7x}.$$

Multiplying the differential equation by $I(x)$ gives $e^{-7x}y' - 7e^{-7x}y = 6xe^{-7x}$

$$\Rightarrow (e^{-7x}y)' = 6xe^{-7x} \Rightarrow e^{-7x}y = \int 6xe^{-7x} dx = -\frac{6}{7}xe^{-7x} - \frac{6}{49}e^{-7x} + C$$

[by parts] $\Rightarrow y = -\frac{6}{7}x - \frac{6}{49} + Ce^{7x}.$