$$u' + (\lambda+\mu)u = \lambda$$

integrating factor:

$$I(t) = e^{(\lambda+\mu)t}$$

$$e^{(\lambda+\mu)t}u' + e^{(\lambda+\mu)t}(\lambda+\mu)u = e^{(\lambda+\mu)t}\lambda$$

$$\int \left(e^{(\lambda+\mu)t}u' + e^{(\lambda+\mu)t}(\lambda+\mu)u\right)dt = \int e^{(\lambda+\mu)t}\lambda\, dt$$

$$e^{(\lambda+\mu)t}u = \int e^{(\lambda+\mu)t}\lambda\, dt + C$$

$$u = e^{-(\lambda+\mu)t}\left[\int e^{(\lambda+\mu)t}\lambda\, dt + c\right]$$

$$u = e^{-(\lambda+\mu)t}\left[\lambda\int e^{(\lambda+\mu)t}dt + c\right]$$

$$= e^{-(\lambda+\mu)t}\left[\lambda\frac{1}{\lambda+\mu}e^{(\lambda+\mu)t} + c\right]$$

$$= e^{-(\lambda+\mu)t}\left[\frac{\lambda}{\lambda+\mu}e^{(\lambda+\mu)t} + c\right]$$

$$= \frac{\lambda}{\lambda+\mu} + ce^{-(\lambda+\mu)t}$$

$$u(0) = \frac{\lambda}{\lambda+\mu} + C = u_0$$

$$C = u_0 - \underbrace{\frac{\lambda}{\lambda+\mu}}_{= u^*}$$

$$u = u^* + e^{-(\lambda+\mu)t}(u_0 - u^*) \quad //$$

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