Pb. 7.

$$y' + ay = be^{-\lambda x} \to \mu = e^{\int a\,dx} = e^{ax}$$

$$(e^{ax}y)' = be^{ax}e^{-\lambda x} = be^{(a-\lambda)x}$$

$$e^{ax}y = b\int e^{(a-\lambda)x}dx = \begin{cases} \frac{b}{a-\lambda}e^{(a-\lambda)x} + C, & \lambda \neq a \\ bx, & \lambda = a \end{cases}$$

$$y = e^{-ax}\begin{cases} \frac{b}{a-\lambda}e^{(a-\lambda)x} + C, & \lambda \neq a \\ bx, & \lambda = a \end{cases}$$

$$= \begin{cases} \frac{b}{a-\lambda}e^{(a-\lambda)x}e^{-ax} + Ce^{-ax}, & \lambda \neq a \\ bxe^{-ax}, & \lambda = a \end{cases}$$

$$= \begin{cases} \frac{b}{a-\lambda}e^{-\lambda x} + Ce^{-ax}, & \lambda \neq a \to 0 \text{ as } x \to \infty \\ bxe^{-ax}, & \lambda = a \to 0 \text{ as } x \to \infty \end{cases}$$

$$\lim_{x\to\infty} xe^{-ax} \overset{L.R}{=} \lim_{x\to\infty} \frac{x}{e^{ax}} = \lim_{x\to\infty} \frac{1}{ae^{ax}} = 0$$