$$y(x) - \frac{1}{2} \int_{a}^{b} x e^{s} y(s) ds = e^{-x}$$
$$y(x) = e^{-x} + Cx$$
$$C = \frac{a - b}{e^{b}(b - 1) - e^{a}(a - 1) - 2}$$