

$$\begin{aligned}
 & \boxed{2/38} \quad v dv = a ds ; \quad \frac{v dv}{-Kv^2} = ds, \quad \int_{v_1}^{v_2} \frac{dv}{v} = -K \int_0^s ds \\
 & \ln \frac{v_2}{v_1} = -Ks, \quad K = \frac{1}{s} \ln \frac{v_1}{v_2} = \frac{1}{1500} \ln \frac{100}{20} = \underline{1.073 (10^{-3}) \text{ ft}^{-1}} \\
 & a = \frac{dv}{dt} ; \quad -Kv^2 = \frac{dv}{dt}, \quad \int_{v_1}^{v_2} \frac{dv}{v^2} = -Kt, \quad t = \frac{1}{K} \left(\frac{1}{v_2} - \frac{1}{v_1} \right) \\
 & t = \frac{10^3}{1.073} \left(\frac{1}{20} - \frac{1}{100} \right) \frac{30}{44} = \underline{25.4 \text{ sec}}
 \end{aligned}$$