2/39 $a = -kv = \frac{dv}{dt}$

$$-k\int_0^t dt = \int_{v_0}^{v} \frac{dv}{v} \Rightarrow v = v_0 e^{-kt}$$

Given conditions: $1 = 4e^{-k(2)}$, $k = 0.693\ s^{-1}$

So $v = v_0 e^{-0.693t}$

When $v = \frac{v_0}{10}$: $\frac{v_0}{10} = v_0 e^{-0.693T}$, $\underline{T = 3.32\ s}$

Also, $a = -kv = v\frac{dv}{ds}$

$$-k\int_{s=0}^{s} ds = \int_{v_0}^{v} dv, \quad v = v_0 - ks$$

Given conditions: $\frac{v_0}{10} = v_0 - kD$

With $k = 0.693\ s^{-1}$ and $v_0 = 4\ m/s$:

$\frac{4}{10} = 4 - 0.693D$, $\underline{D = 5.19\ m}$

(We note that T is independent of v_0; D is not.)