Ch 4 Review # 13

constant acceleration: $a(t) = k$

The velocity is $\int a(t)\,dt$: $\int k\,dt = kt + C_1$

$v(0) = 0 + C_1 = 0$ when $C_1 = 0$.

$v(t) = kt$

So $s(t) = \int kt\,dt = \frac{k}{2}t^2 + C_2$

$s(0) = 0 + C_2 = 0$ when $C_2 = 0$

$s(t) = \frac{k}{2}t^2$

$s(30) = \frac{k}{2}(30)^2$ and $s(30) = 3600$

so $3600 = 450k$

$k = 8\,ft/sec^2$

and $v(30) = k(30) = \frac{8\,ft}{sec^2} \cdot 30\,sec = \boxed{240\,ft/sec}$