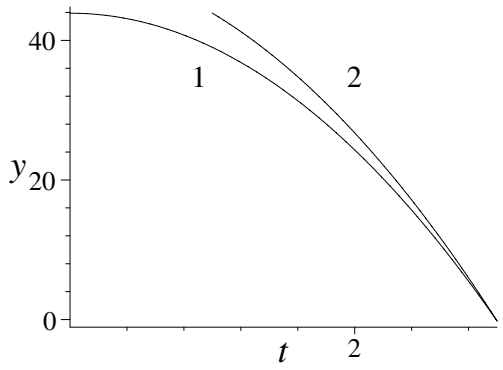
60. We neglect air resistance, which justifies setting $a = -g = -9.8$ m/s^2 (taking *down* as the $-y$ direction) for the duration of the motion. We are allowed to use Eq. 2-15 (with Δy replacing Δx) because this is constant acceleration motion. We use primed variables (except t) with the first stone, which has zero initial velocity, and unprimed variables with the second stone (with initial downward velocity $-v_0$, so that v_0 is being used for the initial *speed*). SI units are used throughout.

$$\begin{aligned} \Delta y' &= 0(t) - \frac{1}{2}gt^2 \\ \Delta y &= (-v_0)\,(t-1) - \frac{1}{2}g(t-1)^2 \end{aligned}$$

Since the problem indicates $\Delta y' = \Delta y = -43.9$ m, we solve the first equation for t (finding $t = 2.99$ s) and use this result to solve the second equation for the initial speed of the second stone:



$$-43.9 = (-v_0)\,(1.99) - \frac{1}{2}(9.8)(1.99)^2$$

which leads to $v_0 = 12.3$ m/s.