A child rolls a ball up a ramp and it accelerates at -2.0 m/s^2 after leaving the child's hand. After rolling for 3.5 s, it stops and begins to roll back down. What was the speed of the ball when it left the child's hand?

Solution

$$v = v_0 + at$$

when it stops

$$v = v_0 + at = 0 \gg v_0 = -at = -\left(-2.0\frac{\text{m}}{\text{s}^2}\right)3.5\ \text{s} = 7\frac{\text{m}}{\text{s}}$$