Answer on Question #50142, Physics, Mechanics | Kinematics | Dynamics

A car was moving with a velocity 24ms^{-1}. Suddenly the driver saw a child on his way, just 8m away from the car. The driver immediately pressed the brakes. But it was too late; the car skidded to a halt at 12m. What was the velocity of the car at the moment when it ran over the child?

Solution:

Kinematics equation

$$2ad = -v_i^2$$

where *a* is acceleration, *d = 12 m* is distance to stop, v_i is initial velocity.

Thus,

$$a = \frac{-v_i^2}{2d} = \frac{-24^2}{2 * 12} = -24 \text{ m/s}^2$$

Again kinematics equation

$$a = \frac{v_f^2 - v_i^2}{2d_2}$$

$$v_f = \sqrt{v_i^2 + 2ad_2} = \sqrt{24^2 - 2 * 24 * 8} = 8\sqrt{3} = 13.86 \text{ m/s}$$

Answer: $v_f = 13.86 \text{ m/s}$