

A car initially travelling at 10 m/s East accelerates at +3.0 m/s² over a distance of 80.0 m. What is the final Velocity?

$a = +3.0 \text{ m/s}^2$
 $d = 80 \text{ m}$
 $V_i = +10$
 $V_f = ?$

$V = \frac{d}{t}$ $a = \frac{V}{t}$ $V_f = V_i + at$ $d = V_i t + \frac{1}{2} a t^2$

$d = \left(\frac{V_i + V_f}{2}\right) t$ Eqn #3 $V_f^2 = V_i^2 + 2ad$

$$V_f^2 = \left(+10 \frac{\text{m}}{\text{s}}\right)^2 + 2\left(3.0 \frac{\text{m}}{\text{s}^2}\right)\left(80.0 \text{ m}\right)$$

$$= 100 \frac{\text{m}^2}{\text{s}^2} + 480 \frac{\text{m}^2}{\text{s}^2}$$

$$\sqrt{V_f^2} = \sqrt{580 \frac{\text{m}^2}{\text{s}^2}}$$

$$= +24.8 \frac{\text{m}}{\text{s}}$$

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