

$$4. \quad 110 \frac{\text{km}}{\text{h}} \times \frac{1000 \text{ m}}{\text{km}} \times \frac{\text{h}}{3600 \text{ s}} = 30.56 \text{ m/s}$$

	Police stopped	Police accelerating	Police const vel.
initial pos	0	→ 0	→ 76.56
final pos	0	ⓑ 76.56	1300 (1.3 km)
initial vel	0	→ 0	→ 30.56
final vel	0	30.56	30.56
acc.	0	6.1	0
duration time	2	ⓐ 5.01	ⓒ 40.03

$$\text{ⓐ } v_f = v_0 + at$$

$$30.56 = 0 + 6.1 t$$

$$t = 5.01$$

$$\text{ⓒ } x_f = x_0 + v_0 t$$

$$1300 = 76.56 + 30.56 t$$

$$40.03 = t$$

$$\text{ⓑ } x_f = x_0 + v_0 t + \frac{1}{2} a t^2$$

$$= 0 + 0 + \frac{1}{2} (6.1) (5.01)^2$$

$$= 76.56$$

$$\text{total time} = 2 + 5.01 + 40.03$$

$$47.04$$

$$\text{total dist.} = 1300$$

$$\text{speeder's speed} = \frac{\Delta x}{\Delta t} = \frac{1300}{47.04} = \underline{\underline{27.64 \text{ m/s}}}$$