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 $\Delta v = \int a dt = \text{area under } a-t \text{ curve}$

$$\text{For } t = 4s, \quad v_4 - 100 = -4(9.81) \frac{4-2}{2}, \quad v_4 = \underline{60.8 \text{ m/s}}$$

$$\text{For } t = 8s, \quad v_8 - 60.8 = -4(9.81)(6-4), \quad v_8 = \underline{-17.72 \text{ m/s}}$$