

$$1) v = \frac{\Delta x_1 + \Delta x_2}{t_1 + t_2} = \frac{10 + 20}{1.8 + 0.8} = \frac{30}{2.6} = 11.54 \frac{\text{km}}{\text{h}}$$

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$$2) a = \frac{\Delta v}{\Delta t} = \frac{10 - 0}{2.6 - 0} = 3.8 \frac{\text{m}}{\text{s}^2}$$

$$3) W = mg \Rightarrow 1 = m \times 10 \Rightarrow m = 0.1 \text{ kg}$$

$$F = ma \Rightarrow 1 = 0.1 a \Rightarrow a = 10 \frac{\text{m}}{\text{s}^2}$$

$$4) m = 2 \text{ kg}$$

Diagram: A block with forces 10 N (left) and 4 N (right).

$$\begin{aligned} \Sigma F &= ma \\ (10 - 4) &= 2a \\ 6 &= 2a \\ a &= 3 \frac{\text{m}}{\text{s}^2} \end{aligned}$$

$$5) P_1 = P_2$$

$$\frac{F_1}{A_1} = \frac{F_2}{A_2}$$

$$\frac{100}{A_1} = \frac{F_2}{400 A_1} \Rightarrow F_2 = 4000 \text{ N}$$