

(ii) $a = \frac{v}{t_1} \Rightarrow t_1 = \frac{v}{a}$

Distance = area

$$\therefore x = \frac{1}{2} t_1 v + t v + \frac{1}{2} t_1 v$$

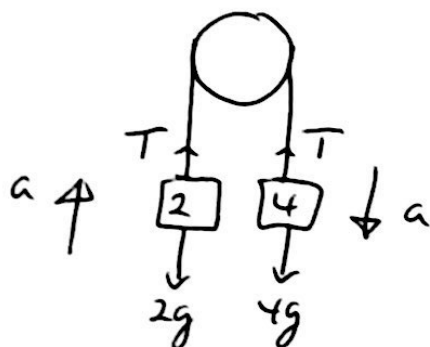
$$x = \frac{1}{2} \left(\frac{v}{a}\right) v + t v + \frac{1}{2} \left(\frac{v}{a}\right) v$$

$$\therefore x = \frac{v^2}{a} + t v$$

$$\therefore x - \frac{v^2}{a} = t v$$

$$\therefore \boxed{\frac{x}{v} - \frac{v}{a} = t} \quad \checkmark$$

②



$$T - 2g = 2a$$

$$4g - T = 4a$$

$$2g = 6a$$

$$\boxed{\frac{2}{3} g \text{ m/s}^2 = a}$$

$$\therefore T - 2g = 2 \left(\frac{2}{3} g\right)$$

$$\boxed{T = \frac{8g}{3} \text{ N}}$$