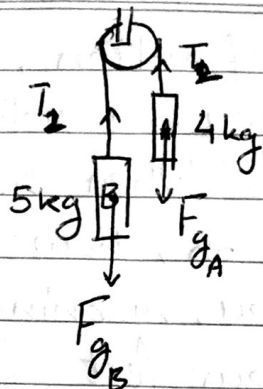


29.



$$\sum F_B = F_{gB} - T_1$$

$$= 50 - T_1$$

$$T_1 = F_{gA} = 40$$

$$\sum F_A = F_{gA} - T_2$$

$$= 40 - T_2$$

$$T_2 = F_{gB} = 50$$

$$\sum F_A = 40 - 50 = -10$$

$$m_A a = -10$$

$$4a = -10$$

$$a_A = -2.5 \text{ m/s}^2$$

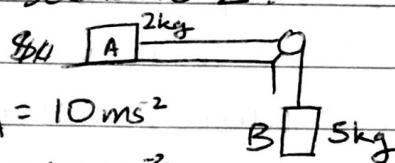
$$\sum F_B = 50 - 40 = 10$$

$$m_B a = 10$$

$$5a = 10$$

$$a_B = 2 \text{ m/s}^2$$

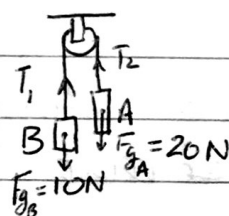
for scenario 2:



$$a_A = 10 \text{ m/s}^2$$

$$a_B = 10 \text{ m/s}^2$$

for scenario 3:



$$\sum F_A = 20 - T_2$$

$$T_2 = F_{gB} = 50$$

$$m_A a_A = 10$$

$$a_A = 5 \text{ m/s}^2$$

$$a_B = -10 \text{ m/s}^2$$

$$\sum F_M = T_1 - F_{gM}$$

$$m_M a = T_1 - m_M g$$

$$T_1 = m_M (a + g)$$

$$m_M = 15 \quad a = 1 \quad g = 10$$

$$a) T_1 = 15 \times 11 = 165 \text{ N}$$

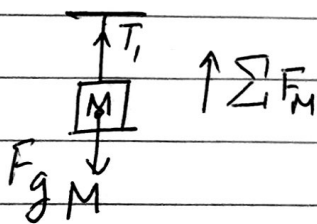
$$b) s = ut + \frac{1}{2} at^2$$

$$s = 5 \text{ m} \quad a = 1 \quad u = 0$$

$$5 = 0.5 t^2$$

$$t^2 = 10 \Rightarrow t = 3.16 \text{ s}$$

30.



$$\uparrow \sum F_M$$