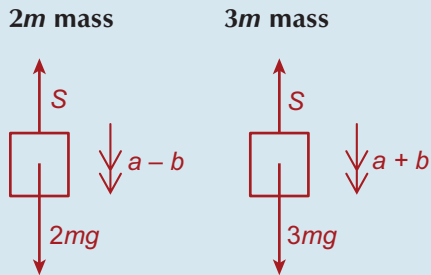
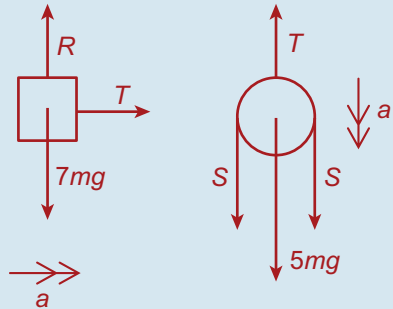


- (ii) Pulley A: Acceleration: $a = \frac{g}{11} \text{ m/s}^2$
- Pulley C: Acceleration: $2a = \frac{2g}{11} \text{ m/s}^2$
- 2 kg particle:
- Acceleration: $b - 2a = \frac{g}{11} \text{ m/s}^2$
- 4 kg particle:
- Acceleration: $b + 2a = \frac{8g}{11} \text{ m/s}^2$

Q. 5. 7m mass 5m pulley

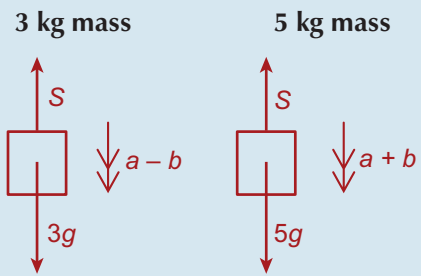
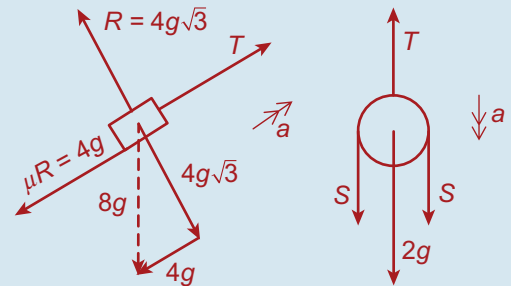


Equations of Motion

- A:** $T = 7ma$
- B:** $2S + 5mg - T = 5ma$
 $\Rightarrow 2S + 5mg - 7ma = 5ma$
 $\Rightarrow S = \frac{m(12a - 5g)}{2}$
- C:** $2mg - S = 2m(a - b)$
- D:** $3mg - S = 3m(a + b)$
- C becomes:** $2mg - \frac{m(12a - 5g)}{2}$
 $= 2m(a - b) \dots \text{multiply by } \frac{2}{m}$
 $\Rightarrow 4g - 12a + 5g = 4a - 4b$
 $\Rightarrow 16a - 4b = 9g \dots \text{Equation E}$

- D becomes:** $3mg - \frac{m(12a - 5g)}{2}$
 $= 3m(a + b) \dots \text{multiply by } \frac{2}{m}$
 $\Rightarrow 6g - 12a + 5g = 6a + 6b$
 $\Rightarrow 18a + 6b = 11g \quad \text{Equation F}$
- Equation E** ($\times 3$): $48a - 12b = 27g$
- Equation F** ($\times 2$): $36a + 12b = 22g \dots \text{add}$
 $84a = 49g$
 $a = \frac{49g}{84}$
- $\Rightarrow a = \frac{7}{12} gm/s^2 \dots \text{acceleration of } 7m \text{ mass}$

Q. 6. 8 kg mass 2 kg pulley



- 8 kg mass **A:** $T - 8g = 8a$
 $T = 8g + 8a$
- 2 kg pulley **B:** $2g + 2S - T = 2a$
 $\Rightarrow 2g + 2S - 8g - 8a = 2a$
 $\Rightarrow S = 5a + 3g$
- 3 kg mass **C:** $3g - S = 3(a - b)$
- 5 kg mass **D:** $5g - S = 5(a + b)$
- Equation C becomes:** $3g - 5a - 3g$
 $= 3a - 3b$
 $\Rightarrow 8a - 3b = 0 \quad \text{Equation E}$