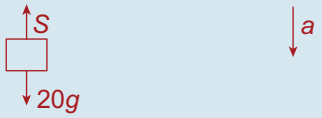
20 kg's

Forces **Acceleration**



$20g - S = 20a$ **Equation 3**

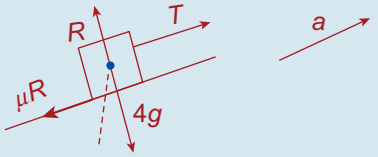
Adding these gives

$17g = 33a$

$\Rightarrow a = \frac{17}{33}g$

(ii) **5 kg's**

Resolved Forces **Acceleration**



$R = 4g$

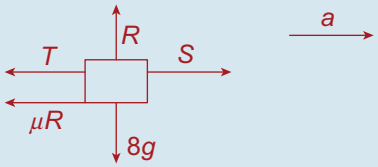
$\Rightarrow \mu R = \frac{1}{4}(4g) = g$

$\therefore T - g - 3g = 5a$

$\Rightarrow T - 4g = 5a$ **Equation 1**

8 kg's

Forces **Acceleration**



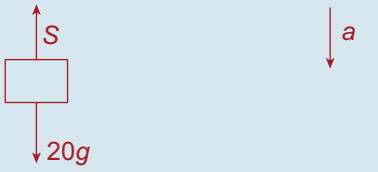
$R = 8g$

$\Rightarrow \mu R = \frac{1}{4}(8g) = 2g$

$S - 2g - T = 8a$ **Equation 2**

20 kg's

Forces **Acceleration**



$20g - S = 20a$ **Equation 3**

Adding gives

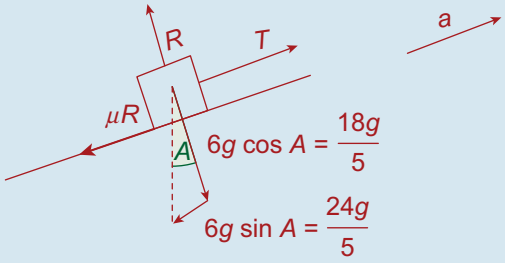
$14g = 33a$

$\Rightarrow a = \frac{14g}{33}$

Q. 5. Since $\tan A = \frac{4}{3}$, $\sin A = \frac{4}{5}$, $\cos A = \frac{3}{5}$

18 kg's

Forces **Acceleration**



$R = \frac{18g}{5}$

$\Rightarrow \mu R = \frac{1}{6}\left(\frac{18g}{5}\right)$

$= \frac{3g}{5}$

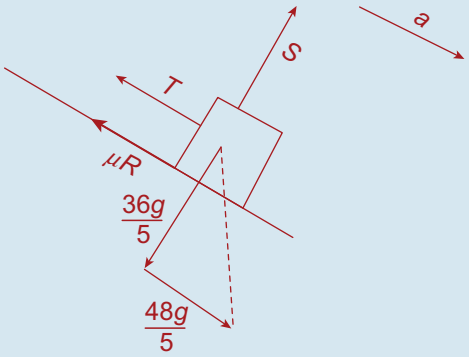
$F = ma$

$\Rightarrow T - \frac{3g}{5} - \frac{24g}{5} = 6a$

$\Rightarrow T - \frac{27g}{5} = 6a$ **Equation 1**

2 kg's

Forces **Acceleration**



$= \frac{36g}{5} \Rightarrow \mu S = \frac{1}{6}\left(\frac{36g}{5}\right) = \frac{6g}{5}$

$= Ma \Rightarrow \frac{48g}{5} - \frac{6g}{5} - T = 12a$

$\Rightarrow \frac{42g}{5} - T = 12a$ **Equation 2**

Adding these gives:

$3g = 18a$

$\Rightarrow a = \frac{1}{6}g$

$\Rightarrow T = \frac{32g}{5}$