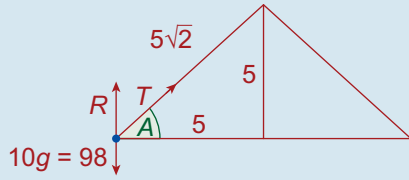
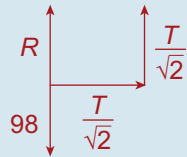


Q. 4.

**Forces**



**Resolved**



$$(i) \sin A = \frac{5}{5\sqrt{2}} = \frac{1}{\sqrt{2}} \Rightarrow A = 45^\circ$$

$$(ii) \textcircled{1} R + \frac{T}{\sqrt{2}} = 98$$

$$\textcircled{2} F_c = m\omega^2 r$$

$$\Rightarrow \frac{T}{\sqrt{2}} = (10)(1)(5)$$

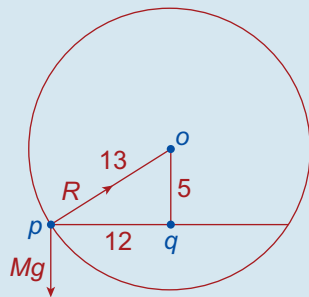
$$\Rightarrow T = 50\sqrt{2} \text{ N}$$

$$(iii) \textcircled{1} \Rightarrow R + 50 = 98$$

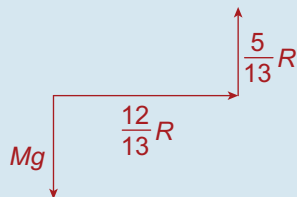
$$\Rightarrow R = 48 \text{ N}$$

Q. 5.

**Forces**



**Resolved**



$$\textcircled{1} Mg = \frac{5}{13}R$$

$$\Rightarrow R = \frac{13Mg}{5}$$

$$\textcircled{2} F_c = \frac{mv^2}{r}$$

$$\Rightarrow \frac{12}{13}R = \frac{Mv^2}{12}$$

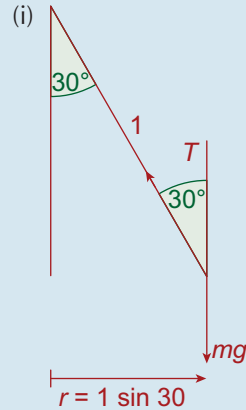
$$\text{But } R = \frac{13Mg}{5}$$

$$\therefore \frac{12}{13} \left( \frac{13Mg}{5} \right) = \frac{Mv^2}{12}$$

$$\Rightarrow v = \sqrt{\frac{144g}{5}}$$

$$= 16.8 \text{ m/s}$$

Q. 6.



**Forces**  $\uparrow = \downarrow$

$$\Rightarrow T \cos 30 = mg$$

$$\Rightarrow T = \frac{2mg}{\sqrt{3}}$$

(ii) **NZL:**  $\Sigma F = ma$

$$\leftarrow T \sin 30 = m\omega^2 r$$

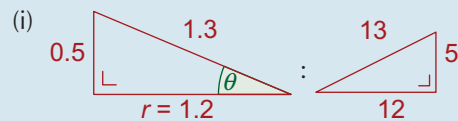
$$\Rightarrow T = m\omega^2 \frac{\sin 30}{\sin 30}$$

$$\Rightarrow \omega^2 = \frac{T}{m}$$

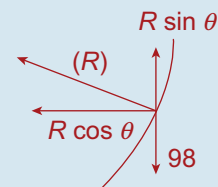
$$\Rightarrow \omega^2 = \frac{2mg}{\sqrt{3}m}$$

$$\Rightarrow \omega = 3.364 \text{ rad/s}$$

Q. 7.



**Forces**



(ii)  $\uparrow = \downarrow$

$$\Rightarrow \frac{5R}{13} = 98$$

$$\Rightarrow R = 254.8 \text{ N}$$