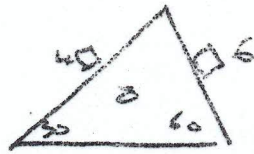


1989 (II) P 5

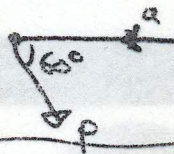


not connected

Mass 4kg:



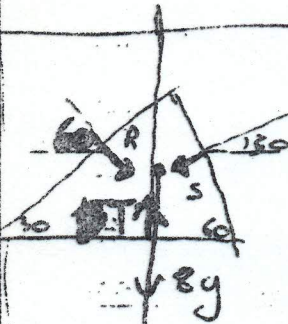
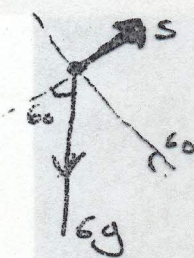
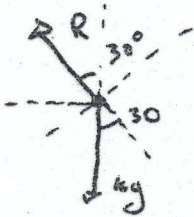
6kg



8kg



forces:



II:

⊥ plane

$$R - 4g \cos 30 = 4[a \sin 30]$$

|| plane

$$4g \sin 30 = 4[fa \cos 30]$$

NT:

⊥ plane.

$$S - 6g \cos 60 = 6[-a \sin 60] + R \cos 60 - S \cos 30 = 0$$

|| plane

$$6g \sin 60 = [6a \cos 60] \quad \uparrow \text{same sign}$$

Need to find a: ① ② and ③ just involve R, S, and a.

$$\text{①} \Rightarrow R - 4g \frac{\sqrt{3}}{2} = 4a \frac{1}{2} \Rightarrow R - 2\sqrt{3}g = 2a \quad \text{①'}$$

$$\text{②} \Rightarrow S - 6g \frac{1}{2} = 6\left(-a \frac{\sqrt{3}}{2}\right) \Rightarrow S - 3g = -3\sqrt{3}a \quad \text{②'}$$

$$\text{③} \Rightarrow R \frac{1}{2} - S \frac{\sqrt{3}}{2} = -8a \Rightarrow R - \sqrt{3}S = -16a \quad \text{③'}$$

Elim. Rows "no one go"

$$\text{①} \Rightarrow 2\sqrt{3}g - R = -2a$$

$$\sqrt{3} \times \text{②}' \Rightarrow \sqrt{3}S - 3\sqrt{3}g = -9a$$

$$\text{③}' \Rightarrow R - \sqrt{3}S = -16a$$

$$\text{Add} \Rightarrow -\sqrt{3}g = -27a$$

$$\frac{\sqrt{3}g}{27} = a$$

$$\Rightarrow a = \frac{g}{9\sqrt{3}} \text{ ms}^{-2}$$

**NB:** You would get an A on this question by just getting diagrams and equations.  $\Rightarrow$  Don't waste time solving equations!