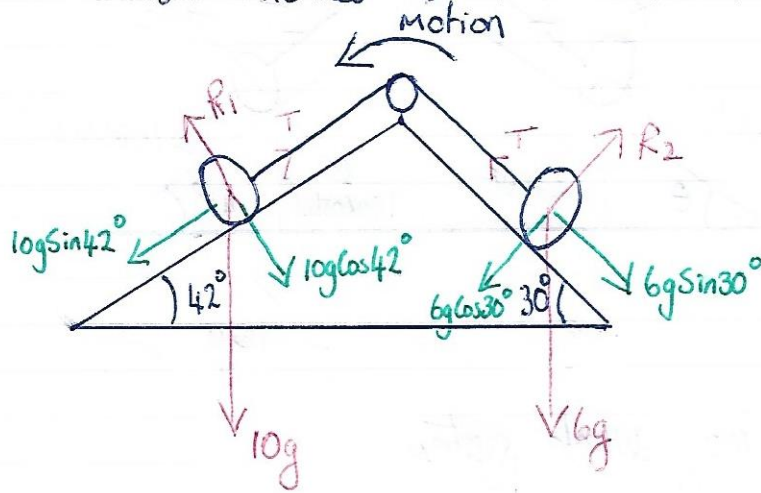


Double Inclined Plane : Acceleration : Answers

1)



$Rf = ma$ whole system

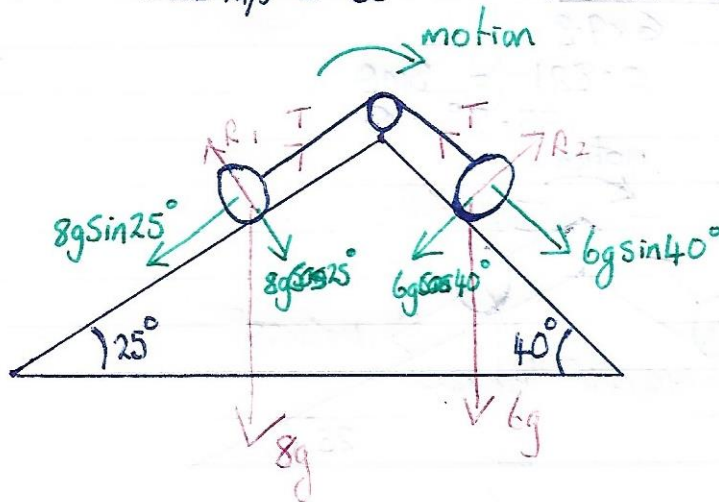
$$10g \sin 42^\circ - 6g \sin 30^\circ = 16a$$

$$65.6 - 29.4 = 16a$$

$$2.26 \text{ m/s}^2 = a$$

Motion as indicated.

2)



First find $8g \sin 25^\circ = 33.13 \text{ N}$

$$6g \sin 40^\circ = 37.80 \text{ N}$$

∴ motion →

$Rf = ma$ whole system

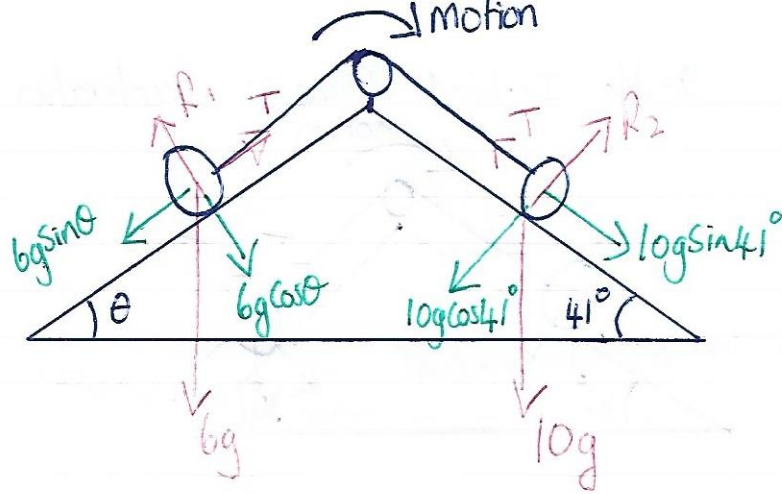
$$6g \sin 40^\circ - 8g \sin 25^\circ = 14a$$

$$37.8 - 33.13 = 14a$$

$$\frac{4.67}{14} = a$$

$$0.33 \text{ m/s}^2 = a$$

3)



$RF = ma$ whole system

$$10g \sin 41^\circ - 6g \sin \theta = 16(1)$$

$$64.29 - 6g \sin \theta = 16$$

$$\frac{64.29 - 16}{6 \times 9.8} = \sin \theta$$

$$0.821 = \sin \theta$$

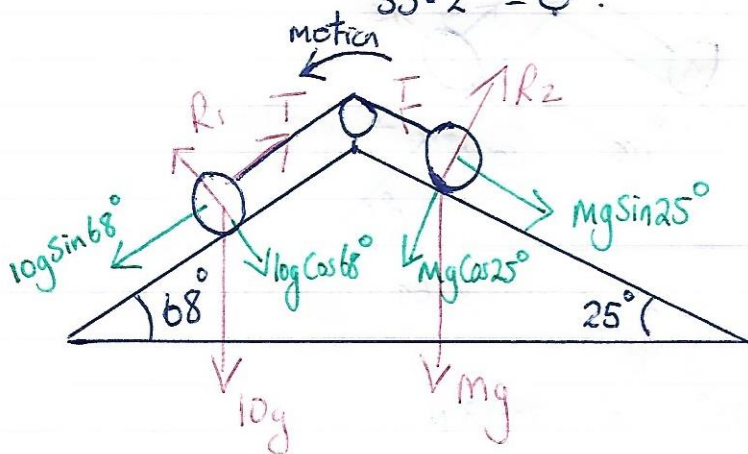
$$55.2^\circ = \theta$$

$RF = ma$ 6 kg mass
 $T - 6g \sin 55.2^\circ = 6(1)$

$$T = 6 + 48.3$$

$$T = 54.3 \text{ N}$$

4)



$RF = ma$ whole system

$$10g \sin 68^\circ - mg \sin 25^\circ = (10 + m)(1.5)$$

$$90.86 - 4.14m = 15 + 1.5m$$

$$90.86 - 15 = 1.5m + 4.14m$$

$$75.86 = 5.64m$$

$$\frac{75.86}{5.64} = m$$

$$13.4 \text{ kg} = m$$

$RF = ma$ for 10 kg

$$10g \sin 68^\circ - T = 10(1.5)$$

$$90.86 - 15 = T$$

$$75.86 \text{ N} = T$$