

## Mathematics Questions by Topics

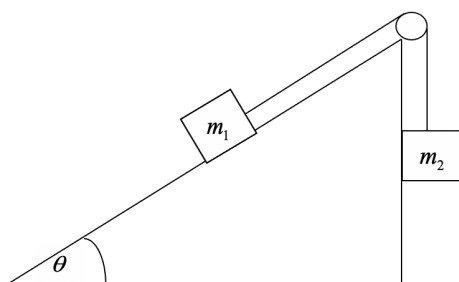
### Motion and Force

### Question 13

Source: K17SM2Q13

#### Question 13

A particle of mass  $m_1$  kg is on a smooth plane, inclined at an angle of  $\theta$  to the horizontal. It is connected by a light string which passes around a smooth pulley to another mass of  $m_2$  kg hanging vertically, as shown in the diagram.



Which of the following is **false**?

- A. The tension in the string is equal to  $\frac{m_1 m_2 (1 + \sin(\theta))}{m_1 + m_2}$  kg-wt.
- B. If  $m_2 > m_1 \sin(\theta)$  the mass  $m_2$  moves downwards with an acceleration  $\frac{g(m_2 - m_1 \sin(\theta))}{m_1 + m_2}$   $\text{ms}^{-2}$ .
- C. If  $m_2 = m_1 \sin(\theta)$  the masses remain at rest.
- D. If  $m_2 = 2m_1$  and  $\theta = 30^\circ$  the tension in the string is  $\frac{g}{2}$  newtons.
- E. If  $m_2 = 2m_1$  and  $\theta = 30^\circ$  the mass  $m_2$  moves downwards with an acceleration  $\frac{g}{2}$   $\text{ms}^{-2}$ .