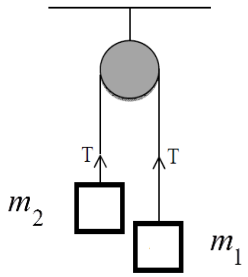
Year 12 Physics 2021
Worksheet 4- Mechanics

Write the answers in your Exercise Book.

1. Two unequal masses m_1 and m_2 where m_1 is greater than m_2, are suspended over a pulley by a light inelastic string, as shown in the diagram. The pulley is frictionless.



(a) Show that the **acceleration** of the system is given by

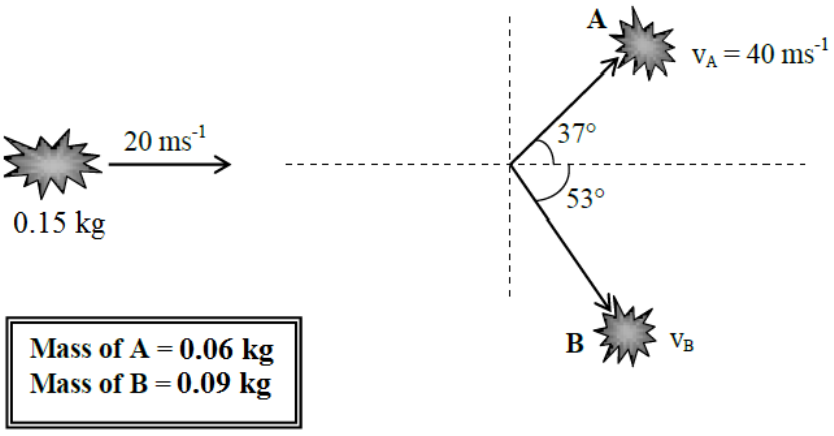
$$a = \frac{m_1 g - m_2 g}{m_1 + m_2}$$ **(2 marks)**

If $m_1 = 6kg$ and $m_2 = 2kg$ find

(b) the **acceleration** of the system. **(1 mark)**

(c) the **tension** in the string. **(2 marks)**

2. When a firework of mass 0.15 kg reaches its highest point, it has a horizontal velocity of 20 ms^{-1}. At this point, it explodes into two parts, **A** and **B**, as shown.



(a) Calculate the momentum of 0.15 kg mass before the explosion. **(1 mark)**.

(b) Determine the velocity of mass **B** after the explosion? **(2 mark)**