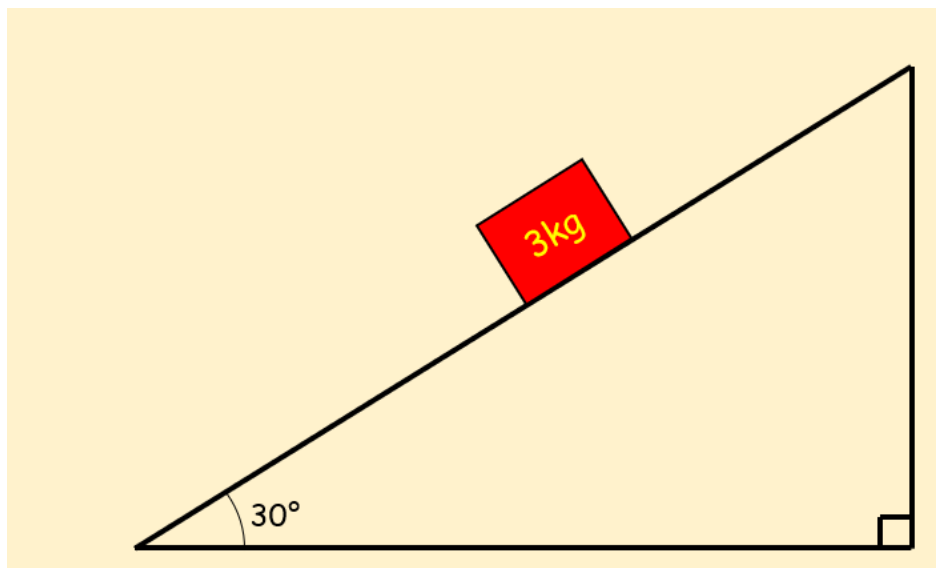# 5B Slopes on a Plane

1. A box of mass 2kg is resting on a smooth plane inclined at an angle of 20° to the horizontal. It meets resistance of 2N as it travels down the slope

   a) Calculate the acceleration of the box down the slope

   b) If the box starts 10m up the plane, calculate the velocity of the box at the bottom of the plane

   c) Find the normal reaction between the box and the plane

2. A particle P of mass 2kg is moving on a smooth slope and is being acted on by a force of 4N that acts parallel to the slope as shown.

The slope is inclined at an angle α to the horizontal, where $tan\alpha = \frac{3}{4}$. Work out the acceleration of the particle.

3. A particle of mass m is pushed up a smooth slope by a force of magnitude 5g acting at an angle of 60° to the slope. This causes the particle to accelerate up the slope at 0.5ms^{-2}.

Show that the mass of the particle is $\left(\frac{5g}{1+g}\right) kg$