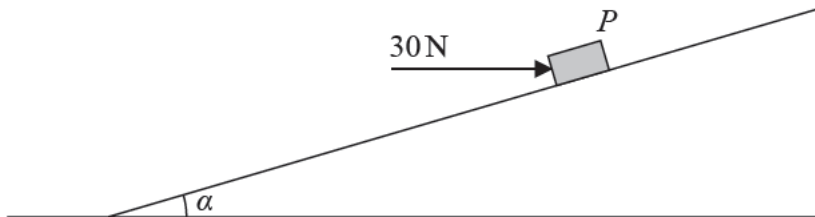


4.

**Figure 3**

A package P of weight 20 N is moving up an inclined plane under the action of a horizontal force of magnitude 30 N , as shown in Figure 3.

The force is acting in a vertical plane through a line of greatest slope of the plane. The coefficient of friction between P and the plane is μ

The plane is inclined at angle α to the horizontal, where $\tan \alpha = \frac{5}{12}$

Package P is modelled as a particle.

(a) Find the magnitude of the normal reaction of the plane on P

(2)

(b) Find the range of possible values of μ

(4)

The horizontal force is now removed and P continues to slide up the plane until P comes to instantaneous rest.

Package P then slides back down the plane.

Given that $\mu = \frac{1}{3}$

(c) find the acceleration of P as it slides down the plane.

(5)