5.

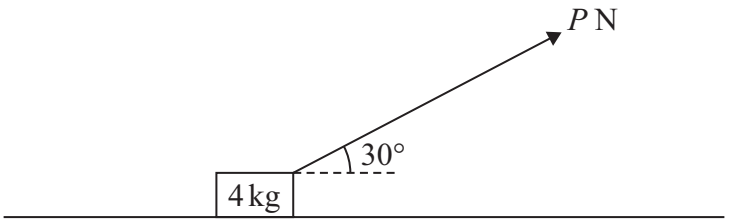

Figure 3

A box of mass 4 kg is placed on a rough horizontal surface.

A force of magnitude P newtons, acting at 30° to the horizontal, is applied to the box, as shown in Figure 3.

The coefficient of friction between the box and the surface is $\frac{2}{3}$

The box is modelled as a particle.

(a) Find the value of P when the box is on the point of sliding along the surface.

(6)

The value of P is now increased to 25 and the box moves along the surface.

Find

(b) the acceleration of the box,

(5)

(c) the speed of the box when it has moved 1.5 m.

(2)

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Question 5 continued

(Total for Question 5 is 13 marks)