



Figure 1

A particle P has mass 5 kg .

The particle is pulled along a rough horizontal plane by a horizontal force of magnitude 28 N .

The only resistance to motion is a frictional force of magnitude F newtons, as shown in Figure 1.

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

(1)

The particle is accelerating along the plane at 1.4 m s^{-2}

(b) Find the value of F

(2)

The coefficient of friction between P and the plane is μ

(c) Find the value of μ , giving your answer to 2 significant figures.

(1)

(a) the Normal Reaction balances the weight exactly
 $R = 5g \text{ N}$

(b) Horizontal Force = $28 - F = ma$
 $= 5(1.4)$
 $= 7$
 so, $F = 28 - 7 = 21 \text{ N}$

(c) In motion, Friction is a maximum = μR
 so, $21 = \mu \times 5g = \mu \times 5(9.8)$
 $\Rightarrow \mu = \frac{21}{5(9.8)} = \frac{3}{7}$
 $= 0.43 \text{ (2sf)}$