15 Fig. 15 shows a particle of mass m kg on a smooth plane inclined at $30°$ to the horizontal. Unit vectors **i** and **j** are parallel and perpendicular to the plane, in the directions shown.
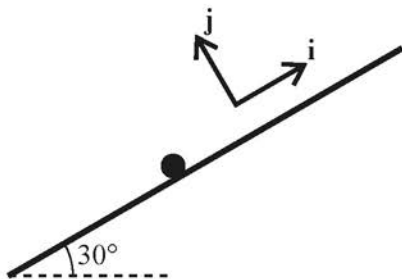
Fig. 15

(a) Express the weight **W** of the particle in terms of m, g, **i** and **j**. [2]

The particle is held in equilibrium by a force **F**, and the normal reaction of the plane on the particle is denoted by **R**. The units for both **F** and **R** are newtons.

(b) Write down an equation relating **W**, **R** and **F**. [1]

(c) Given that $\mathbf{F} = 6\mathbf{i} + 8\mathbf{j}$,
- show that $m = 1.22$ correct to 3 significant figures,
- find the magnitude of **R**. [6]