

Answer **all** the questions in the spaces provided.

- 1 (a) Two forces, with magnitudes 5.0 N and 12 N, act from the same point on an object. Calculate the magnitude of the resultant force R for the forces acting

- (i) in opposite directions,

$$R = \dots \text{N} [1]$$

- (ii) at right angles to each other.

$$R = \dots \text{N} [1]$$

- (b) An object X rests on a smooth horizontal surface. Two horizontal forces act on X as shown in Fig. 1.1.

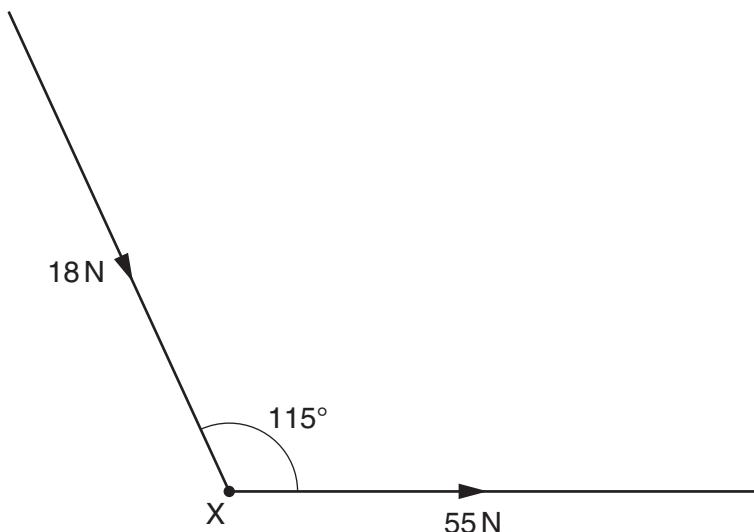


Fig. 1.1 (not to scale)

A force of 55 N is applied to the right. A force of 18 N is applied at an angle of 115° to the direction of the 55 N force.

- (i) Use the resolution of forces or a scale diagram to show that the magnitude of the resultant force acting on X is 65 N.

[2]

- (ii) Determine the angle between the resultant force and the 55 N force.

angle = ° [2]

- (c) A third force of 80 N is now applied to X in the opposite direction to the resultant force in (b).

The mass of X is 2.7 kg.

Calculate the magnitude of the acceleration of X.

acceleration = m s^{-2} [3]

[Total: 9]