

Write your name here

Surname

Other Names

AS/A Level Mathematics

Resolving Forces 1

Candidates may use any calculator allowed by the regulations of the Joint Council for Qualifications. Calculators must not have the facility for symbolic algebra manipulation, differentiation and integration, or have retrievable mathematical formulae stored in them.

Instructions

- Use **black** ink or ball-point pen.
- If pencil is used for diagrams/sketches/graphs it must be dark (HB or B).
- **Fill in the boxes** at the top of this page with your name.
- Answer **all** questions and ensure that your answers to parts of questions are clearly labelled..
- Answer the questions in the spaces provided
– there may be more space than you need.
- You should show sufficient working to make your methods clear.
Answers without working may not gain full credit.
- Answers should be given to three significant figures unless otherwise stated.

Information

- The marks for **each** question are shown in brackets
– use this as a guide as to how much time to spend on each question.

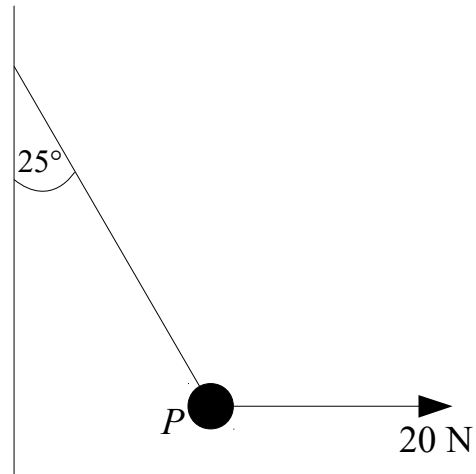
Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

- 1 A particle P is attached to a wall by a light inextensible string. A horizontal force of 20 N is applied to P. The particle is in equilibrium with the string taut making a 25° angle with the vertical as shown in the diagram.

Find

- (a) The tension in the string (2)
(b) The weight of P (3)

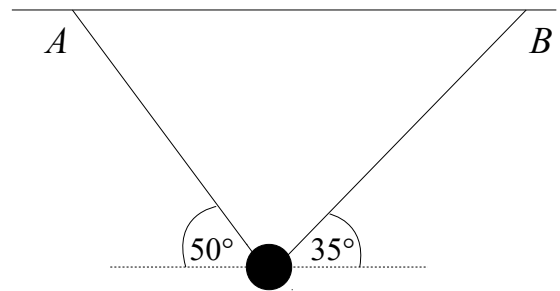


(Total for question 1 is 5 marks)

- 2 A particle P, of mass 10 kg, is held in equilibrium attached to two light inextensible strings. String A is at an angle of 50° to the horizontal. String B is at an angle of 35° to the horizontal as shown in the diagram.

Find

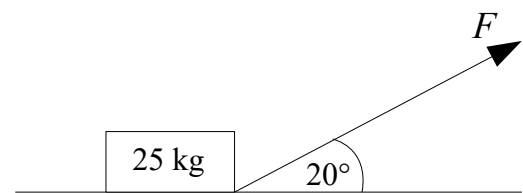
- (a) The tension in string A (5)
(b) The tension in string B (3)



(Total for question 2 is 8 marks)

- 3 A block of mass 25 kg, is at rest on a rough horizontal floor. The coefficient of friction between the block and the floor is 0.4. A force of F N is pulling the block at an angle of 20° to the horizontal. The block is on the point of sliding.

Find the value of F.

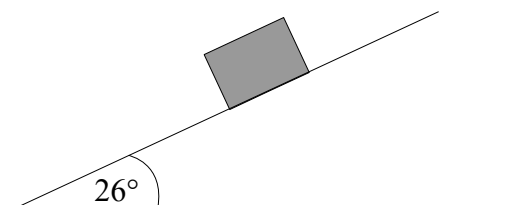


(Total for question 3 is 8 marks)

- 4 A block, of weight 10 N, is at rest on a rough plane inclined at an angle of 26° to the horizontal.

The block is on the point of sliding down the plane.

Find the coefficient of friction between the block and the floor.



(Total for question 4 is 8 marks)