

Write your name here

Surname

Other Names

AS/A Level Mathematics

Resolving Forces 2

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.

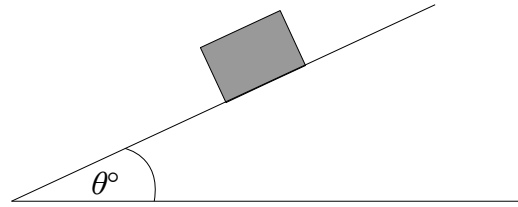
Information

- 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.

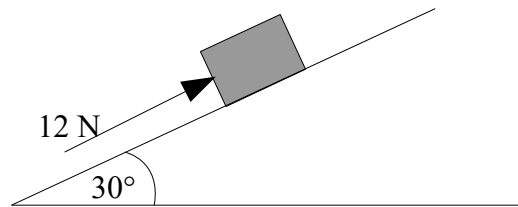
- 1** A block of mass 2kg is at rest on a rough plane inclined at an angle of θ° to the horizontal where $\tan \theta = 0.75$.
The block is released from rest.
The coefficient of friction between the block and the floor is 0.2.



Find the acceleration of the block.

(Total for question 1 is 9 marks)

- 2** A brick of weight 10 N lies on a rough plane inclined at an angle of 30° to the horizontal. A force of 12 newtons acts on the brick acting up the plane and the brick is in equilibrium on the point of slipping up the plane.



Find

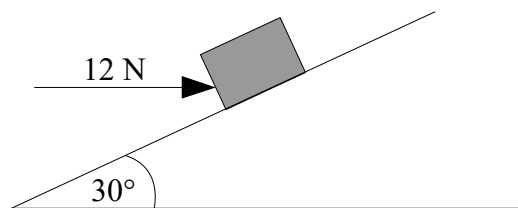
- (a) The coefficient of friction between the brick and the plane **(6)**

The 12 N force is removed.

- (b) Determine whether or not the brick moves **(3)**

(Total for question 2 is 9 marks)

- 3** A brick of weight 10 N lies on a rough plane inclined at an angle of 30° to the horizontal. A horizontal force of 12 newtons acts on the brick and the brick is in equilibrium on the point of slipping up the plane.



Find

- (a) The coefficient of friction between the brick and the plane **(7)**

The 12 N force is removed.

- (b) Determine whether or not the brick moves **(4)**

(Total for question 3 is 11 marks)