

Please check the examination details below before entering your candidate information

Candidate surname					Other names							
Pearson Edexcel					Centre Number				Candidate Number			
International					[] [] [] [] []				[] [] [] [] []			
Advanced Level												
Tuesday 19 January 2021												
Morning (Time: 1 hour 30 minutes)						Paper Reference WME01/01						
Mathematics												
International Advanced Subsidiary/Advanced Level												
Mechanics M1												
You must have: Mathematical Formulae and Statistical Tables (Blue), calculator										Total Marks		

Candidates may use any calculator permitted by Pearson regulations. 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, centre number and candidate number.
- 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.
- Whenever a numerical value of g is required, take $g = 9.8 \text{ m s}^{-2}$, and give your answer to either 2 significant figures or 3 significant figures.

Information

- A booklet 'Mathematical Formulae and Statistical Tables' is provided.
- There are 8 questions in this question paper. The total mark for this paper is 75.
- 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.
- If you change your mind about an answer, cross it out and put your new answer and any working underneath.

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5. A particle is acted upon by two forces **F** and **G**. The force **F** has magnitude 8 N and acts in a direction with a bearing of 240° . The force **G** has magnitude 10 N and acts due South.

Given that $\mathbf{R} = \mathbf{F} + \mathbf{G}$, find

- (i) the magnitude of **R**,
- (ii) the direction of **R**, giving your answer as a bearing to the nearest degree.

(7)

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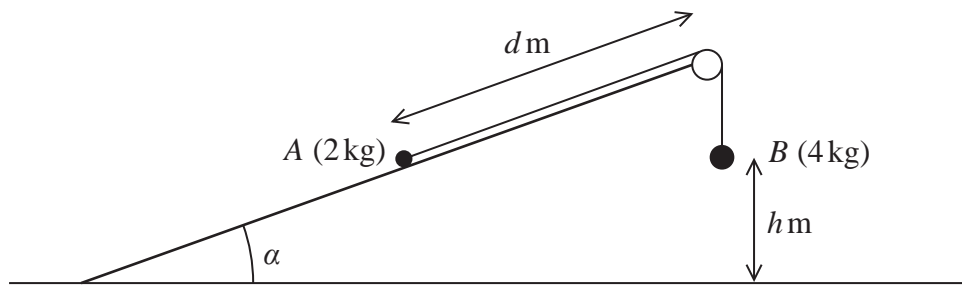


Figure 3

Two particles, A and B , have masses 2 kg and 4 kg respectively. The particles are connected by a light inextensible string. The string passes over a small smooth pulley which is fixed at the top of a rough plane. The plane is inclined to the horizontal ground at an angle α where $\tan \alpha = \frac{3}{4}$. The particle A is held at rest on the plane at a distance d metres from the pulley. The particle B hangs freely at rest, vertically below the pulley, at a distance h metres above the ground, as shown in Figure 3. The part of the string between A and the pulley is parallel to a line of greatest slope of the plane. The coefficient of friction between A and the plane is $\frac{1}{4}$.

The system is released from rest with the string taut and B descends.

- (a) Find the tension in the string as B descends. (9)

On hitting the ground, B immediately comes to rest.

Given that A comes to rest before reaching the pulley,

- (b) find, in terms of h , the range of possible values of d . (7)

- (c) State one physical factor, other than air resistance, that could be taken into account to make the model described above more realistic. (1)

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