

Please check the examination details below before entering your candidate information

Candidate surname

Other names

**Pearson Edexcel**  
**International**  
**Advanced Level**

Centre Number

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Candidate Number

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**Wednesday 24 October 2018**

Morning (Time: 1 hour 30 minutes)

Paper Reference **WME01/01**

**Mechanics M1**

**Advanced/Advanced Subsidiary**

**You must have:**

Mathematical Formulae and Statistical Tables (Blue)

Total Marks

**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). Coloured pencils and highlighter pens must not be used.
- **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 two significant figures or three significant figures.
- When a calculator is used, the answer should be given to an appropriate degree of accuracy.

### Information

- 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.

Turn over ►

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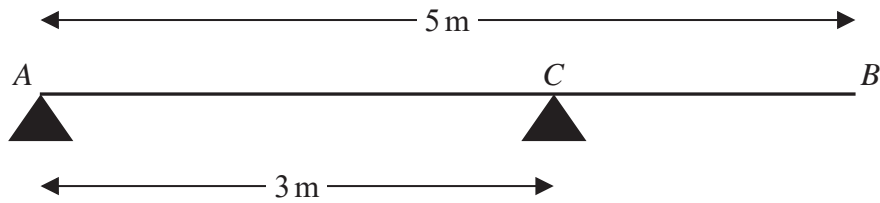


Figure 1

A non-uniform plank  $AB$  has weight  $60\text{ N}$  and length  $5\text{ m}$ . The plank rests horizontally in equilibrium on two smooth supports at  $A$  and  $C$ , where  $AC = 3\text{ m}$ , as shown in Figure 1. A parcel of weight  $12\text{ N}$  is placed on the plank at  $B$  and the plank remains horizontal and in equilibrium. The magnitude of the reaction of the support at  $A$  on the plank is half the magnitude of the reaction of the support at  $C$  on the plank.

By modelling the plank as a non-uniform rod and the parcel as a particle,

- (a) find the distance of the centre of mass of the plank from  $A$ . (6)
- (b) State briefly how you have used the modelling assumption
- (i) that the parcel is a particle,
- (ii) that the plank is a rod. (2)

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Question 7 continued

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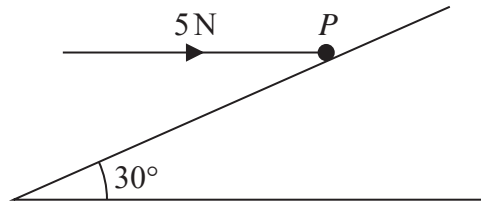


Figure 4

A rough plane is inclined at  $30^\circ$  to the horizontal. A particle  $P$  of mass  $0.5\text{ kg}$  is held at rest on the plane by a horizontal force of magnitude  $5\text{ N}$ , as shown in Figure 4. The force acts in a vertical plane containing a line of greatest slope of the inclined plane. The particle is on the point of moving up the plane.

- (a) Find the magnitude of the normal reaction of the plane on  $P$ . (4)
- (b) Find the coefficient of friction between  $P$  and the plane. (5)

The force of magnitude  $5\text{ N}$  is now removed and  $P$  accelerates from rest down the plane.

- (c) Find the speed of  $P$  after it has travelled  $3\text{ m}$  down the plane. (8)

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**Question 8 continued**

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Question 8 continued

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**Question 8 continued**

Ruled area for writing the answer to Question 8, consisting of 20 horizontal lines.

**Q8**

**(Total 17 marks)**

Grade box containing 'Q8' and a blank space for the mark.

**TOTAL FOR PAPER: 75 MARKS**

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