

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Centre Number

Candidate Number

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**Pearson Edexcel International Advanced Level**

**Wednesday 17 January 2024**

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 (Yellow), 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.

Turn over ►

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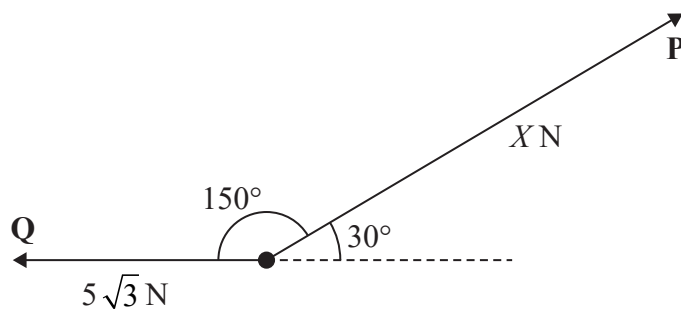


Figure 3

Figure 3 shows two horizontal forces **P** and **Q** acting on a particle.

The angle between the direction of **P** and the direction of **Q** is  $150^\circ$

Force **P** has magnitude  $X$  newtons.

Force **Q** has magnitude  $5\sqrt{3}$  N.

The resultant of **P** and **Q** has magnitude  $\sqrt{129}$  N.

Find

(i) the value of  $X$ .

(ii) the angle between **Q** and the resultant, giving your answer to the nearest degree.

(8)







**Question 4 continued**

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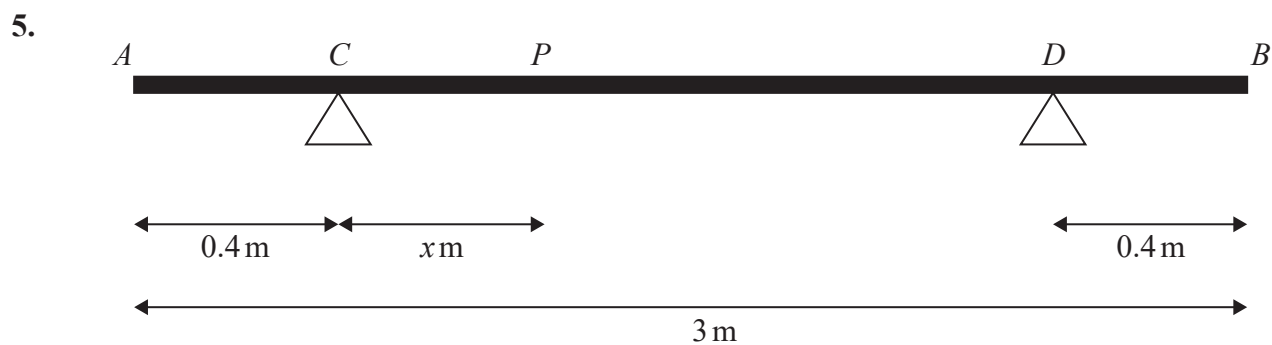


Figure 4

A beam  $AB$  has mass 30 kg and length 3 m.

The beam rests on supports at  $C$  and  $D$  where  $AC = 0.4$  m and  $DB = 0.4$  m, as shown in Figure 4.

A person of mass 55 kg stands on the beam between  $C$  and  $D$ .

The person is modelled as a particle at the point  $P$ , where  $CP = x$  metres and  $0 < x < 2.2$

The beam is modelled as a uniform rod resting in equilibrium in a horizontal position.

Using the model,

- (a) show that the magnitude of the reaction at  $C$  is  $(686 - 245x)$  N. (3)

The magnitude of the reaction at  $C$  is **four** times the magnitude of the reaction at  $D$ .

Using the model,

- (b) find the value of  $x$  (4)

The person steps off the beam and places a package of mass  $M$  kg at  $A$ .

The package is modelled as a particle at the point  $A$ .

The beam is now on the point of tilting about  $C$ .

Using the model,

- (c) find the value of  $M$  (3)

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**Question 5 continued**

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