

Write your name here

Surname

Other names

**Pearson Edexcel**  
**International GCSE**

Centre Number

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Candidate Number

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# Mathematics B

## Paper 1R



Wednesday 14 May 2014 – Morning  
**Time: 1 hour 30 minutes**

Paper Reference

**4MB0/01R**

**You must have:** Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Total Marks

### Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- **Calculators may be used.**

### Information

- The total mark for this paper is 100.
- 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.
- Check your answers if you have time at the end.
- Without sufficient working, correct answers may be awarded no marks.

Turn over ►

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**PEARSON**

Answer ALL TWENTY-NINE questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

1

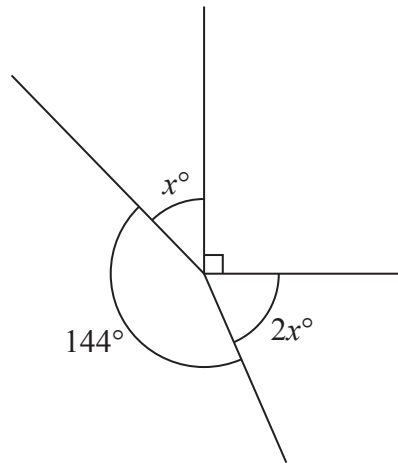


Diagram NOT  
accurately drawn

In the diagram, the four straight lines meet at a point. Find the value of  $x$ .

$x =$  .....

(Total for Question 1 is 2 marks)

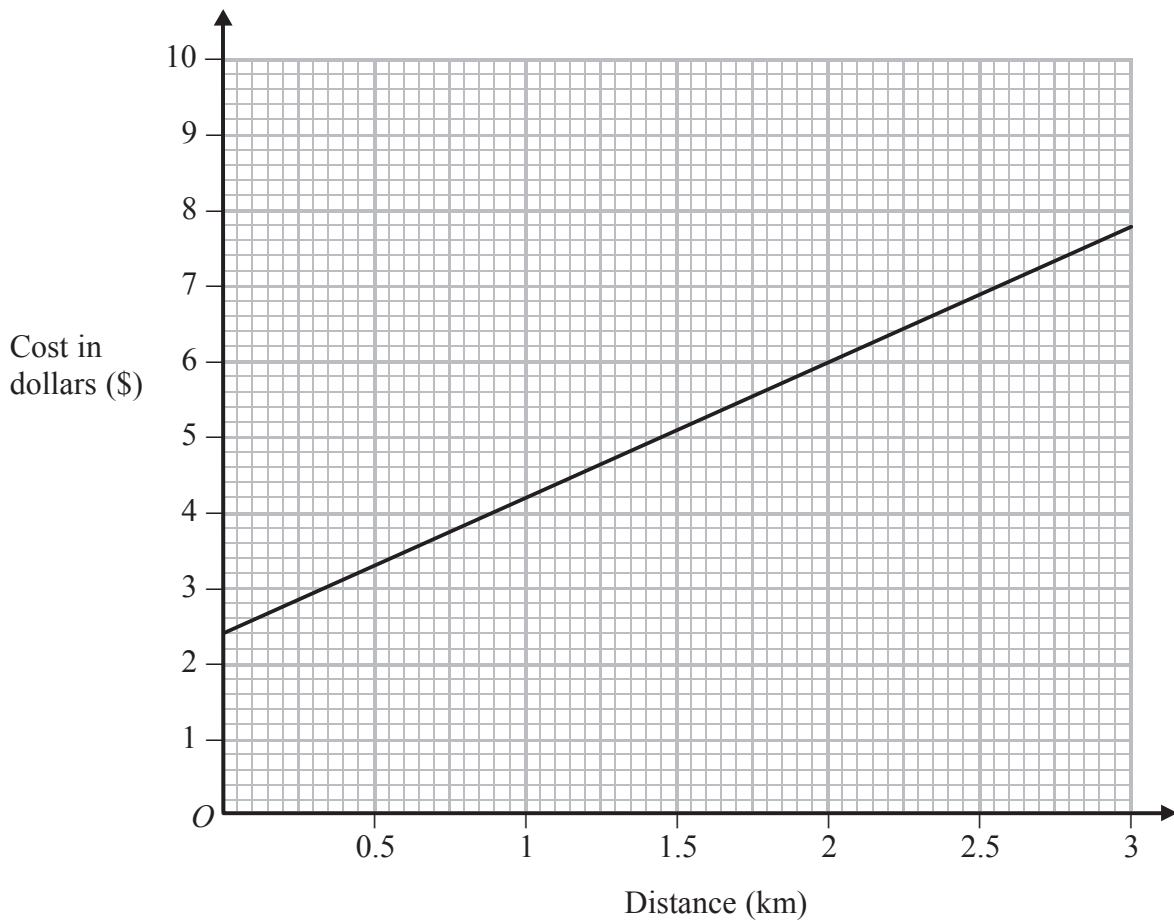
2 Find  $33\frac{1}{3}\%$  of £37.92

£ .....

(Total for Question 2 is 2 marks)



3



The graph gives information about the costs of taxi journeys of different distances. The cost of a taxi journey consists of a fixed initial charge and a charge per km. From the diagram write down

(a) the fixed initial charge,

\$ ..... (1)

(b) the charge per km.

\$ ..... (1)

(Total for Question 3 is 2 marks)



4 Simplify fully  $\frac{3x}{2} \div \frac{9x}{4(x+2)}$

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(Total for Question 4 is 2 marks)

5 Draw accurately the locus of all the points that are 2 cm from the line segment  $AB$ .



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(Total for Question 5 is 2 marks)

6 Factorise completely  $3x^2 - 12y^2$

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(Total for Question 6 is 2 marks)



7 Showing all your working, express  $\sqrt{2} + \sqrt{18}$  in the form  $a\sqrt{2}$  where  $a$  is an integer.

Write down the value of  $a$ .

$a = \dots\dots\dots$

(Total for Question 7 is 2 marks)

8  $\mathbf{A} = \begin{pmatrix} 4 \\ -3 \end{pmatrix}$  and  $\mathbf{B} = (3 \ -1)$

Find the matrix product  $\mathbf{AB}$

(Total for Question 8 is 2 marks)

9 Find  $\frac{dy}{dx}$  where  $y = x^2 + \frac{6}{x}$

$\frac{dy}{dx} = \dots\dots\dots$

(Total for Question 9 is 2 marks)



10 1050 Chinese yuan (¥) is to be divided between three people in the ratios 3 : 5 : 7

Find the difference, in ¥, between the largest share and the smallest share.

¥ = .....

(Total for Question 10 is 3 marks)

11 Simplify fully  $\frac{48x^4y^2}{16x^2y^{-3}}$

(Total for Question 11 is 3 marks)



- 12 The height of a right circular cylinder is four times the radius of the base of the cylinder.  
The volume of the cylinder is  $500\pi \text{ cm}^3$ .

Calculate, in cm, the radius of the base of the cylinder.

..... cm

(Total for Question 12 is 3 marks)

13 Solve  $\frac{x}{3} - \frac{x+2}{5} = \frac{x-2}{6}$

$x =$  .....

(Total for Question 13 is 3 marks)



14 The angle of a sector of a circle of radius 12 cm is  $85^\circ$

Calculate, in  $\text{cm}^2$  to 3 significant figures, the area of the sector.

.....  $\text{cm}^2$

**(Total for Question 14 is 3 marks)**

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15 Expand and simplify  $(x - y)(y + z) - (x + y)(y - z)$

**(Total for Question 15 is 3 marks)**

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16 Find the smallest integer value of  $x$  such that  $28 - 3x \leq 5(x - 3)$

(Total for Question 16 is 3 marks)

17

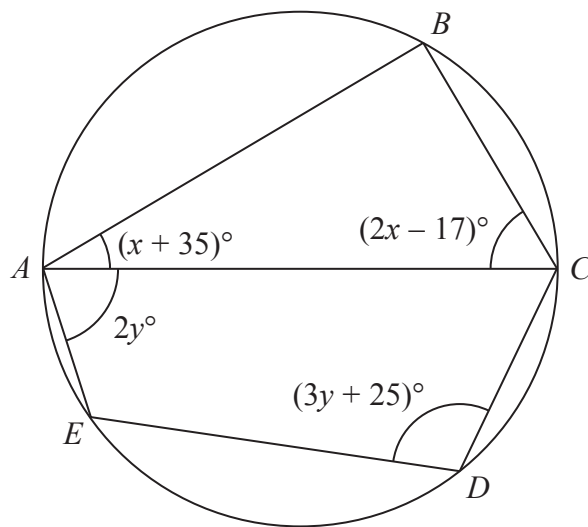


Diagram NOT  
accurately drawn

$ABCDE$  is a circle with diameter  $AC$ .

$\angle BAC = (x + 35)^\circ$  and  $\angle BCA = (2x - 17)^\circ$

(a) Find the value of  $x$ .

$x = \dots\dots\dots$   
(2)

$\angle CAE = 2y^\circ$  and  $\angle CDE = (3y + 25)^\circ$

(b) Find the value of  $y$ .

$y = \dots\dots\dots$   
(2)

(Total for Question 17 is 4 marks)



- 18** The point  $A$  has coordinates  $(3, -4)$   
The point  $B$  is the reflection of the point  $A$  in the line  $y = -x$

(a) Find the coordinates of the point  $B$ .

$B$  (.....,.....)  
(2)

The point  $C$  is such that  $\vec{AC} = \begin{pmatrix} -5 \\ 7 \end{pmatrix}$

(b) Find the coordinates of the point  $C$ .

$C$  (.....,.....)  
(2)

**(Total for Question 18 is 4 marks)**

- 19** Here is a list of eight whole numbers.

8    19    14    15    23    6    4     $x$

The median of these eight numbers is 12

(a) Find the value of  $x$ .

$x =$  .....  
(2)

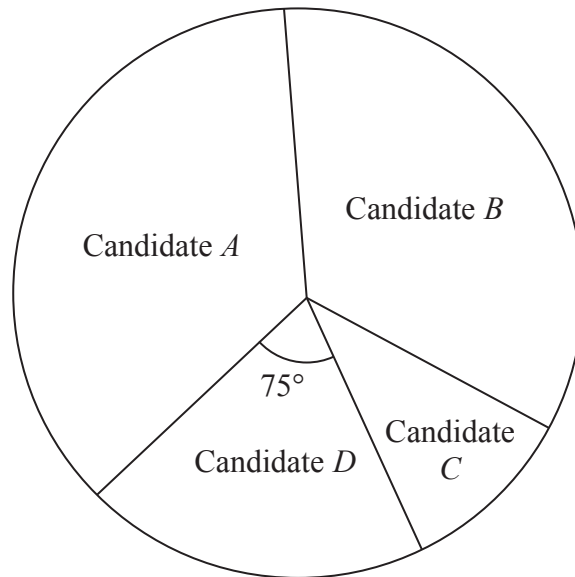
(b) Calculate the mean of the eight numbers.

.....  
(2)

**(Total for Question 19 is 4 marks)**



20

Diagram NOT  
accurately drawn

In the town of *Electoria*, four candidates stood in the election for town mayor. The number of votes each candidate received is represented by the pie chart.

The number of votes Candidate *D* received is 3075 and the angle of the sector for Candidate *D* is  $75^\circ$

(a) Calculate the total number of votes received by all four candidates.

.....  
(2)

Candidate *A* won the election. The angle of the sector for Candidate *A* is  $5^\circ$  greater than the angle of the sector for Candidate *B*.

(b) Calculate how many more votes Candidate *A* received than Candidate *B*.

.....  
(2)

**(Total for Question 20 is 4 marks)**



- 21 Given that  $x = \frac{av + b}{v}$   
express  $v$  in terms of  $a$ ,  $x$  and  $b$ .

$v = \dots\dots\dots$

(Total for Question 21 is 4 marks)

22

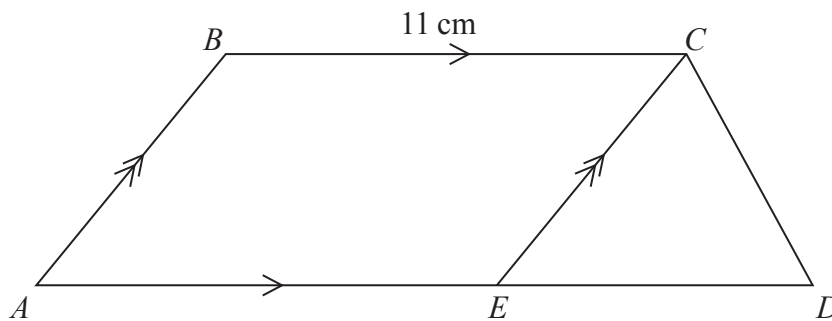


Diagram NOT  
accurately drawn

$ABCD$  is a trapezium with  $BC = 11$  cm,  $AD = 15$  cm and  $BC$  parallel to  $AD$ .  
The point  $E$  on  $AD$  is such that  $EC$  is parallel to  $AB$ .  
The area of  $\triangle ECD = 7$  cm<sup>2</sup>.

Find the area, in cm<sup>2</sup>, of the trapezium  $ABCD$ .

$\dots\dots\dots$  cm<sup>2</sup>

(Total for Question 22 is 4 marks)



23  $y$  varies as the cube of  $x$ , and  $y = 48$  when  $x = 4$

Find  $x$  when  $y = 162$

$x = \dots\dots\dots$

(Total for Question 23 is 4 marks)

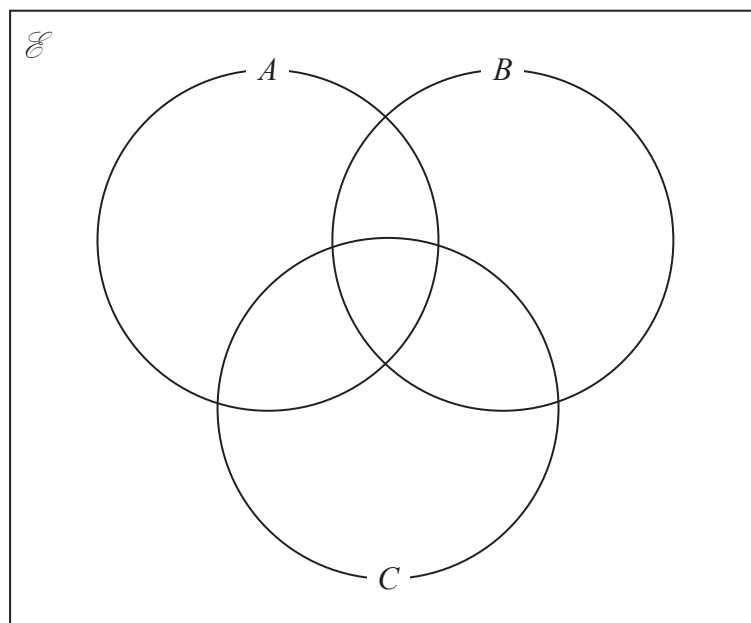
24  $\mathcal{E} = \{ 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 \}$

$A = \{ \text{multiples of } 3 \}$

$B = \{ \text{odd numbers} \}$

$C = \{ \text{factors of } 24 \}$

Complete the Venn diagram by putting each element of  $\mathcal{E}$  in the correct subset of  $\mathcal{E}$ .



(Total for Question 24 is 5 marks)

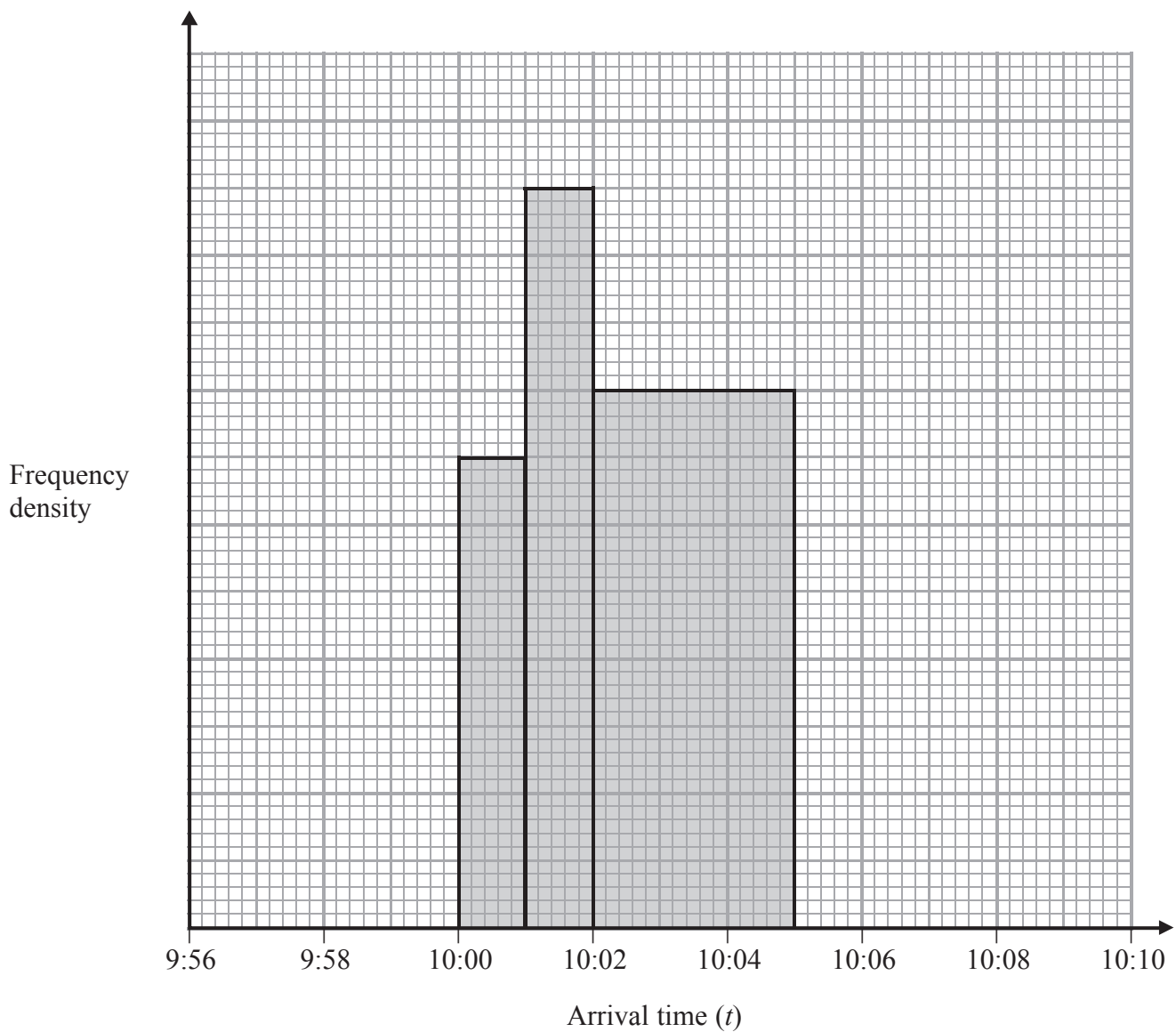


- 25 The *Trumpton Express* is due to arrive at *Feather Green* station every day at 10:00 am. The stationmaster records the arrival times for 120 days. No train arrives more than 4 minutes early or 10 minutes or more late.

The incomplete table and histogram give information about the arrival times.

Using this information, complete the table and the histogram.

Arrival time ( $t$ )	Frequency
$9:56 \leq t < 10:00$	16
$10:00 \leq t < 10:01$	14
$10:01 \leq t < 10:02$	
$10:02 \leq t < 10:05$	
$10:05 \leq t < 10:10$	

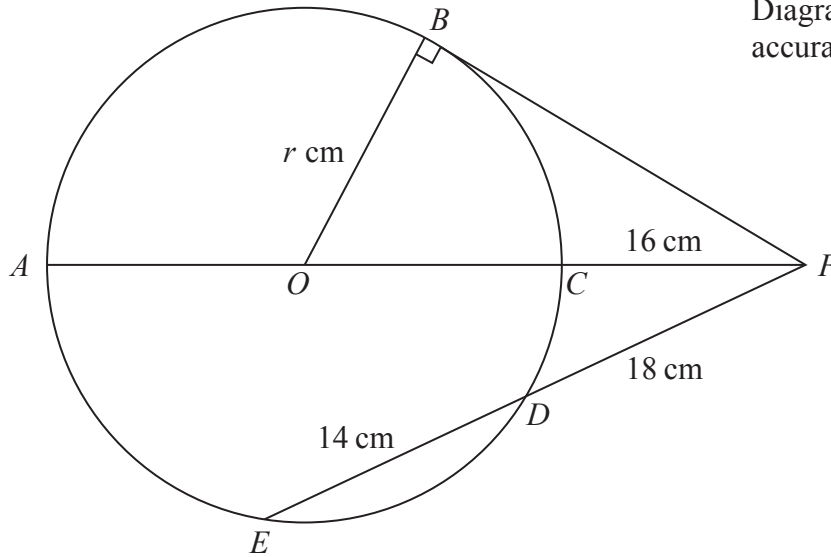


(Total for Question 25 is 5 marks)



26

Diagram NOT accurately drawn



$ABCDE$  is a circle centre  $O$ . The diameter,  $AC$ , is extended to the point  $F$  so that  $CF = 16$  cm. The line  $BF$  is the tangent to the circle at  $B$  and  $FDE$  is a straight line such that  $FD = 18$  cm and  $DE = 14$  cm. The radius of the circle is  $r$  cm.

Calculate

(a) the length, in cm, of  $FB$ ,

$FB = \dots\dots\dots$  cm  
(2)

(b) the value of  $r$ .

$r = \dots\dots\dots$   
(3)

(Total for Question 26 is 5 marks)



27 (a) Show that  $(x - 1)$  is a factor of  $6x^3 + 7x^2 - 18x + 5$

(2)

(b) Hence, or otherwise, completely factorise  $6x^3 + 7x^2 - 18x + 5$

.....  
(3)

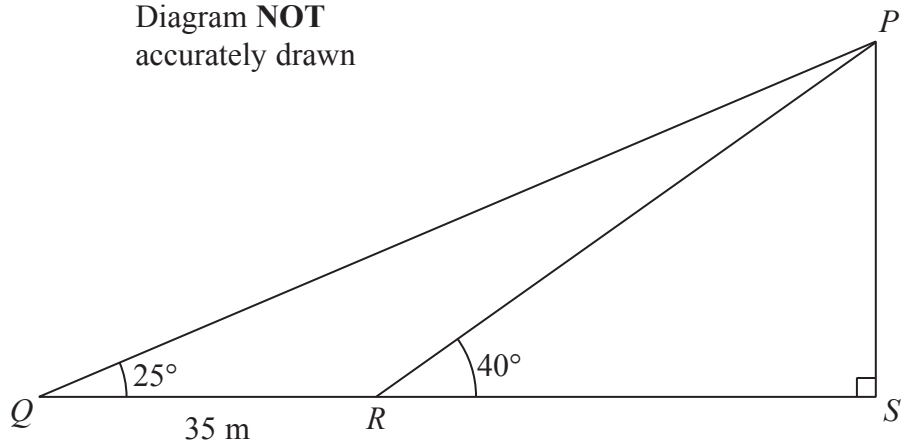
**(Total for Question 27 is 5 marks)**

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28

Diagram NOT  
accurately drawn

The points  $Q$ ,  $R$  and  $S$  lie in a straight line on horizontal ground with  $QR = 35$  m.  
The vertical mast  $PS$  is such that  $\angle PQR = 25^\circ$  and  $\angle PRS = 40^\circ$

(a) Write down the size, in degrees, of  $\angle QPR$ .

$$\angle QPR = \dots\dots\dots^\circ$$

(1)

(b) Calculate the length, in m to 3 significant figures, of  $PR$ .

$$PR = \dots\dots\dots \text{ m}$$

(2)

(c) Calculate the height, in m to 3 significant figures, of the mast  $PS$ .

$$PS = \dots\dots\dots \text{ m}$$

(2)

(Total for Question 28 is 6 marks)



- 29 A particle  $P$  is moving along a straight line. The displacement,  $s$  metres, of  $P$  from a fixed point  $O$  on the line at time  $t$  seconds is given by

$$s = 4 + 12t - t^3 \quad t \geq 0$$

- (a) Write down the distance, in m, of the particle from  $O$  at time  $t = 0$

..... m  
(1)

Particle  $P$  comes to instantaneous rest at the point  $A$ .

- (b) Find the value of  $t$  when  $P$  is at  $A$ .

$t =$  .....  
(4)

- (c) Find the acceleration, in  $\text{m/s}^2$ , of  $P$  when  $P$  is at  $A$ .

.....  $\text{m/s}^2$   
(2)

(Total for Question 29 is 7 marks)

TOTAL FOR PAPER IS 100 MARKS



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