Centre No.						Paper Reference							Surname	Initial(s)
Candidate No.						7	3	6	1	/	0	1	Signature	

Paper Reference(s)

7361/01

Examiner's use only

Team Leader's use only

London Examinations GCE

Mathematics Syllabus B

Ordinary Level

Paper 1

Monday 7 May 2007 – Afternoon

Time: 1 hour 30 minutes

Materials required for examination
Nil

Items included with question papers
Nil

Candidates are expected to have an electronic calculator when answering this paper.

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initial(s) and signature.
Check that you have the correct question paper.
You must write your answer for each question in the space following the question.
If you need more space to complete your answer to any question, use additional answer sheets.

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. **(2)**.
Full marks may be obtained for answers to ALL questions.
There are 28 questions in this question paper. The total mark for this paper is 100.
There are 16 pages in this question paper. Any blank pages are indicated.

Advice to Candidates

Write your answers neatly and legibly.

Page numbers	Leave Blank
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1. Josie pays 98 pence per litre for petrol in England. When Josie travels to America, she pays \$1.20 per litre. Given that £1 = \$1.45, calculate, to the nearest p, how much cheaper a litre of petrol is in America than in England.

Answer ..... p **Q1**

(Total 2 marks)

2. Calculate the exact value of $\dfrac{9^{\frac{1}{2}}}{16^{-\frac{1}{2}}}$.

Answer **Q2**

(Total 2 marks)

3. A light year is 9.465×10^{12} km. The mean distance of the Sun from the Earth is 1.5×10^{8} km. Given that the mean distance of the Sun from the Earth is x light years, find, in standard form to 3 significant figures, the value of x.

Answer x = ... **Q3**

(Total 2 marks)

Leave blank

4. Each internal angle of a regular polygon is 156°. Determine the number of sides of the polygon.

Answer .....

Q4

(Total 2 marks)

5. Factorise $x^2 - xy + xz - zy$.

Answer .....

Q5

(Total 2 marks)

6. Express $7\frac{1}{2}$ minutes as a percentage of one hour.

Answer .....%

Q6

(Total 2 marks)

Leave blank

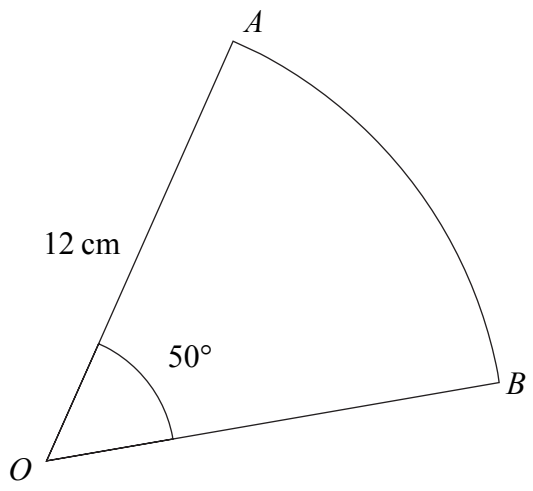
7. Find the smallest integer which satisfies $19 < 3(x - 8)$.

Answer .....

Q7

(Total 2 marks)

8.



OAB is a sector of a circle with radius 12 cm and $\angle AOB = 50°$. Calculate the length, in cm to 3 significant figures, of the arc *AB*.

Answer *AB* =..... cm

Q8

(Total 2 marks)

Leave blank

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

$A = \{\text{prime numbers}\}$,

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

List the elements of

(i) $A \cap B'$,

(ii) $A' \cap B$,

(iii) $(A \cap B') \cup (A' \cap B)$.

Answers (i) .....

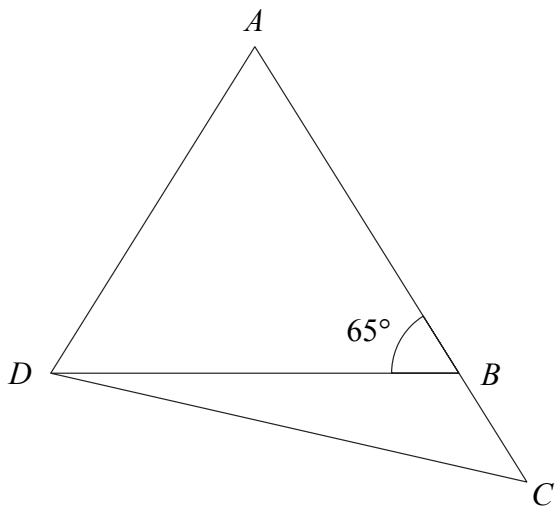
(ii) .....

(iii) .....

(Total 3 marks)

Q9

10.



ABD is an isosceles triangle with $AB = AD$, and $\angle ABD = 65°$. The side AB is extended to the point C so that $AD = DC$. Find the size, in degrees, of $\angle BDC$.

Answer $\angle BDC$ = ... °

(Total 3 marks)

Q10

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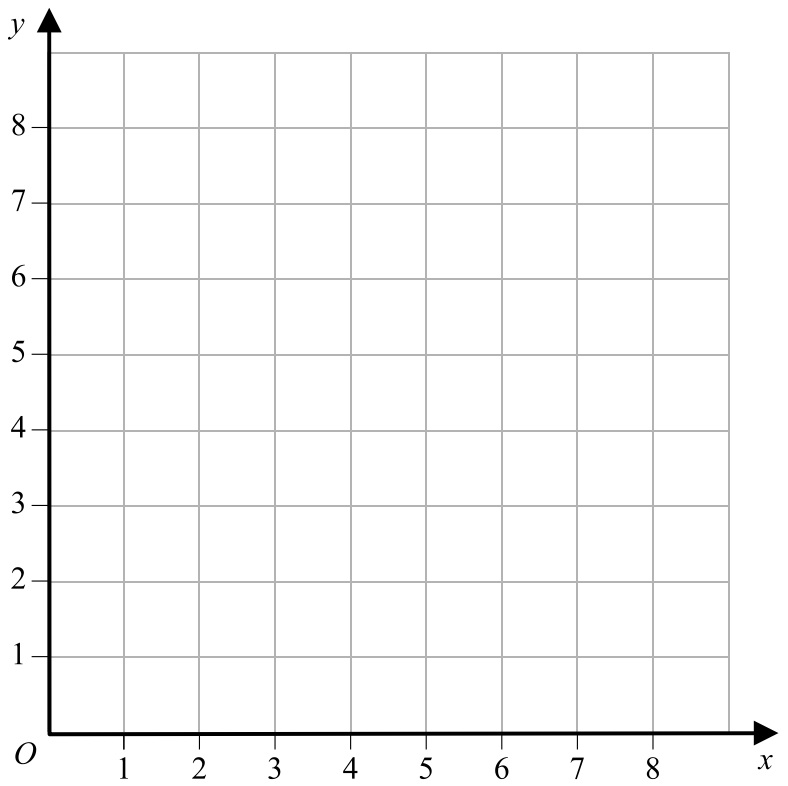
11.



ABCDE is a pentagon. The coordinates of *A*, *C* and *D* are (2, 0), (3, 5) and (5, 5) respectively. The line $y = x$ is the line of symmetry of the pentagon. On the grid, draw and label the pentagon *ABCDE*.

Q11

(Total 3 marks)

12. Solve the equation $\frac{x}{4} - \frac{x+2}{5} = \frac{5}{8}$.

Answer x =.....

Q12

(Total 3 marks)

Leave blank

13. A right circular cone has base radius 7 cm and perpendicular height 24 cm. Show that the curved surface area is 175π cm^2.

Answer .....

.....

.....

.....

.....

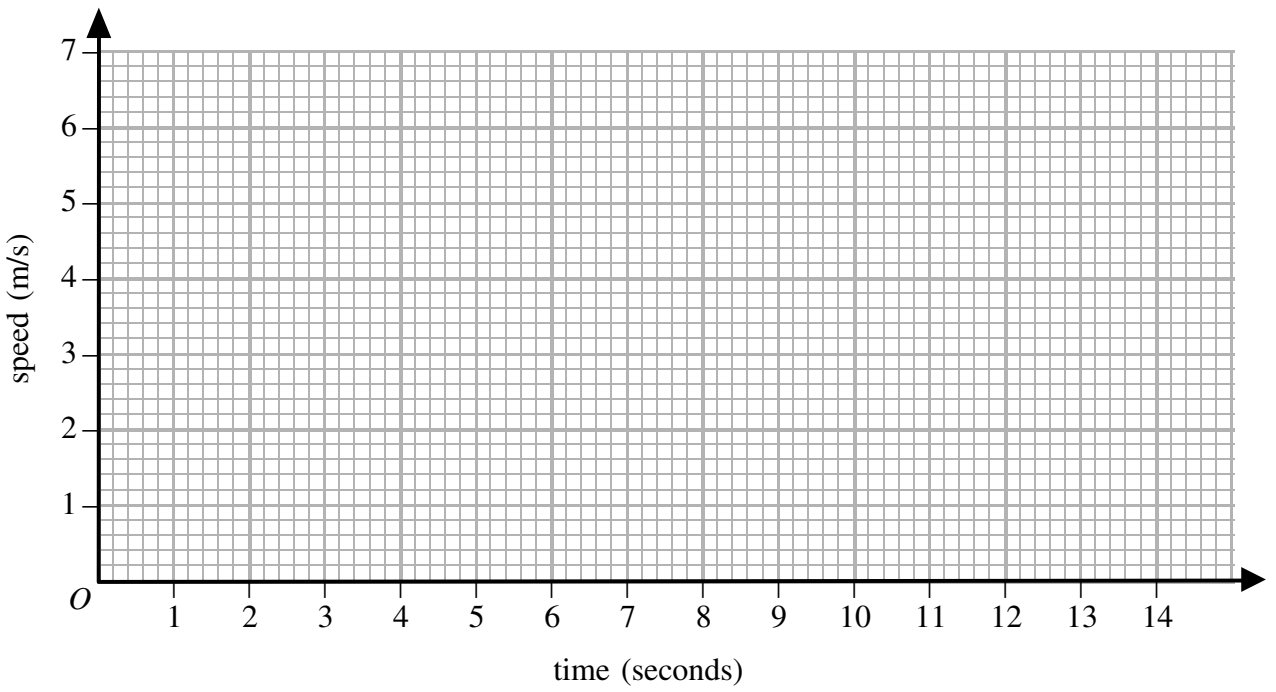
.....

.....

Q13

(Total 3 marks)

14.



At time $t = 0$, a particle is travelling at 6 m/s. The particle travels at this constant speed for a distance of 33 m. The particle then decelerates at a constant rate until it stops. The total distance travelled by the particle is 51 m. On the diagram, draw the speed–time graph for this particle.

Q14

(Total 3 marks)

Leave blank

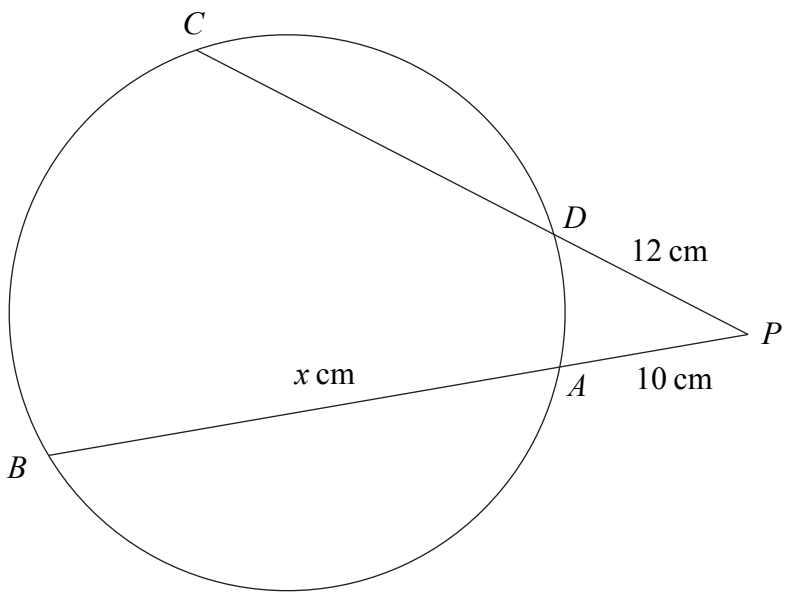
15. A school entered 15 pupils for a mathematics O level examination. The mean mark for the 15 pupils was 56. The 5 weakest pupils had a mean mark of 24. Calculate the mean mark of the other 10 pupils.

Answer .....

Q15

(Total 3 marks)

16.



The point P lies outside a circle $ABCD$ so that PAB and PDC are straight lines. Given that $PA = 10$ cm, $PD = 12$ cm, $AB = x$ cm and $CD = \frac{3}{4}AB$, write down an equation in x and hence find the length, in cm, of CD.

Answer CD =..... cm

Q16

(Total 4 marks)

Leave blank

17. A and B are two similar solids with volumes 48 cm^3 and 2058 cm^3 respectively. The length of one side of B is 21 cm. Calculate the length, in cm, of the corresponding side of A.

Answer ..... cm

Q17

(Total 4 marks)

18. Solve the equation $5x^2 - 11x - 2 = 0$, giving your answers to 2 decimal places.

Answers .....

Q18

(Total 4 marks)

19. Given that $w = \dfrac{2x - 3y}{x - y}$, express x in terms of w and y.

Answer x = ...

Q19

(Total 4 marks)

Leave blank

20. Richard Divers played Bobby Spinsky in a chess tournament. They played a total of 48 games. The results for these 48 games were:

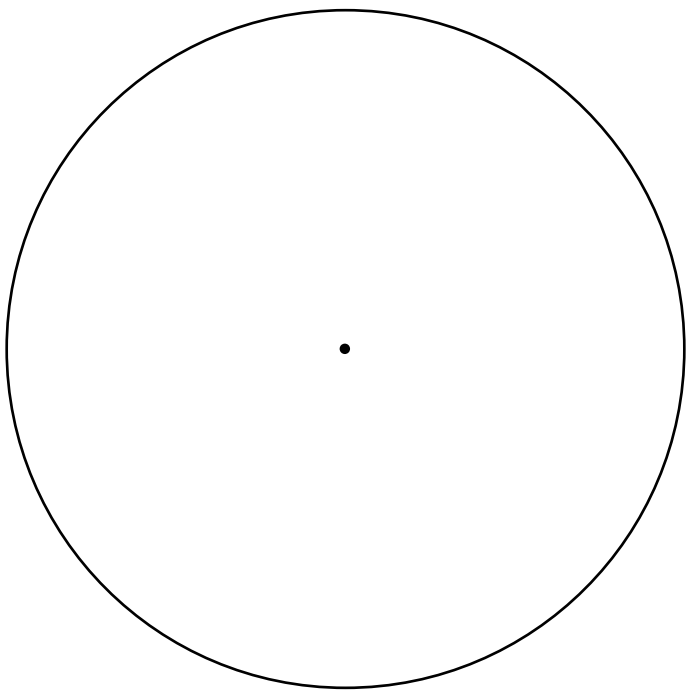
Richard Divers won	26 games
Bobby Spinsky won	14 games
Drawn	8 games

A pie chart is to be drawn to show this information.

(a) Calculate the size, in degrees, of the angle of the sector representing the number of games won by Richard Divers.

Answer ..... °

(2)



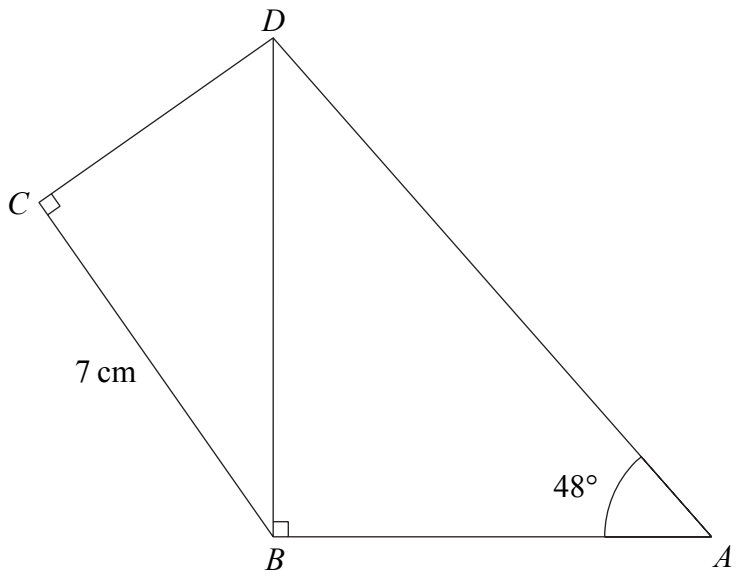
(b) Using the circle, draw an accurate pie chart illustrating the information.
State clearly the size of the angle of each sector.

(2) **Q20**

(Total 4 marks)

Leave blank

21.



In quadrilateral $ABCD$, $\angle ABD = \angle BCD = 90°$, $\angle DAB = 48°$, $\angle ADC = 106°$ and $BC = 7$ cm. Calculate the length, in cm to 3 significant figures, of

(a) BD,

(3)

(b) BA.

(2)

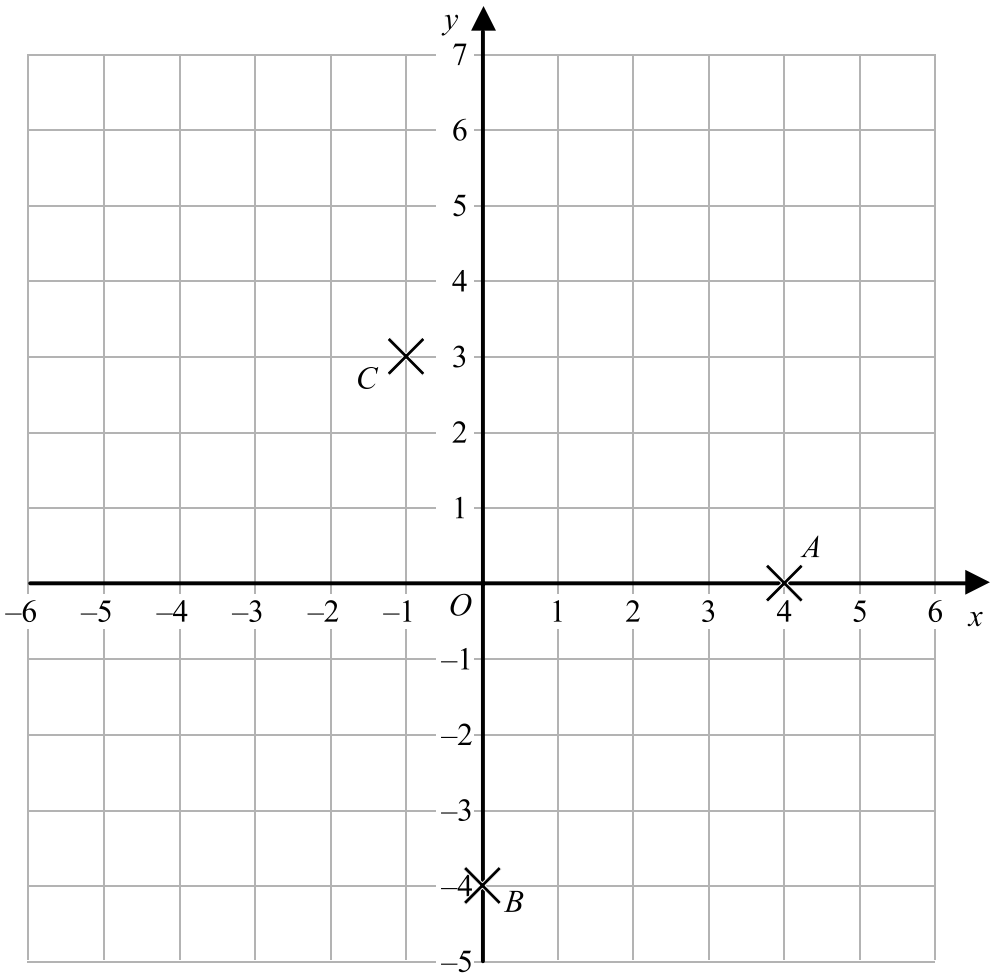
Answers $BD =$ ..... cm

$BA =$ ..... cm **Q21**

(Total 5 marks)

Leave blank

22.



The points $A(4, 0)$, $B(0, -4)$ and $C(-1, 3)$ are shown on the diagram.

On the diagram

(a) draw the locus of points equidistant from A and B,

(2)

(b) draw the locus of points which are 4 cm from C.

(2)

(c) Measure and write down, to the nearest mm, the distance between the two points which are equidistant from A and B, and 4 cm from C.

(1)

Answer ..... mm

Q22

(Total 5 marks)

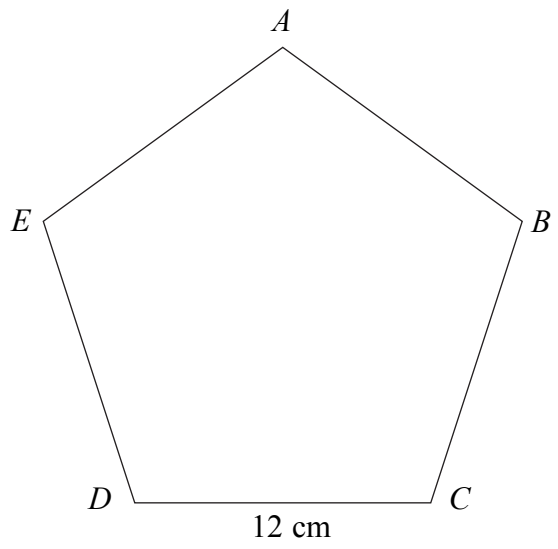
Leave blank

23. A particle is dropped from rest and falls a distance s metres in time t seconds, where s varies directly as the square of t. In the first 2 seconds the particle falls 19.6 metres. Calculate the distance, in metres, the particle falls in the fifth second after it is dropped.

Answer ..... m **Q23**

(Total 5 marks)

24.



ABCDE is a regular pentagon with sides of length 12 cm. Find the area, in cm^2 to 3 significant figures, of the pentagon *ABCDE*.

Answer ..... cm^2 **Q24**

(Total 5 marks)

Leave blank

25. $p * q = pq - q$ and $r \otimes s = r + rs$.

(a) Calculate $3 * (4 \otimes 5)$.

(2)

(b) Solve $5 \otimes (x * 4) = 75$.

(3)

Answers (a).....

(b).....

Q25

(Total 5 marks)

26. Find the values of x which satisfy the equation

$$(5x + 3)(x - 1) = 4.$$

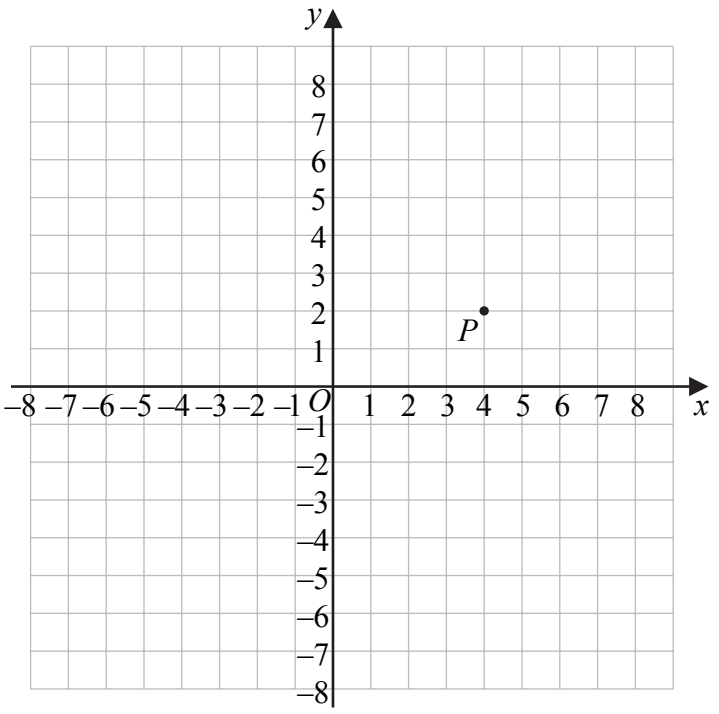
Answer x = ...

Q26

(Total 5 marks)

Leave blank

27.



The translation $\begin{pmatrix} -10 \\ 4 \end{pmatrix}$ maps the point $P(4, 2)$ onto the point Q.

(a) Write down the coordinates of Q and mark the position of Q on the diagram.

(2)

The matrix $\mathbf{M} = \begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$.

The point R is the image of P under the transformation with matrix $\mathbf{M}$.

(b) Find the coordinates of R and mark the position of R on the diagram.

(2)

(c) Show that $\triangle PQR$ is isosceles.

(2)

Answers (a) .....

(b) .....

(c) .....

.....

.....

.....

.....

Q27

(Total 6 marks)

Leave blank

28. The displacement s metres from point O of a particle travelling along a straight line through O, at time t seconds, is given by

$$s = t^3 - 9t^2 + 24t - 20.$$

Find

(a) an expression for the velocity, v m/s, of the particle at time t seconds,

(2)

(b) the velocity of the particle, in m/s, when its acceleration is zero.

(5)

Answers (a).....

(b).....m/s **Q28**

(Total 7 marks)

TOTAL FOR PAPER: 100 MARKS

END