

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

Paper Reference(s)

**7361/01**

**London Examinations GCE  
Mathematics Syllabus B  
Ordinary Level**

**Paper 1**

**Tuesday 6 May 2008 – Morning**

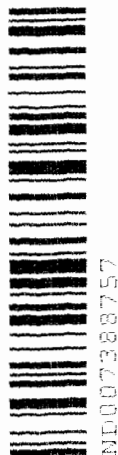
**Time: 1 hour 30 minutes**

Examiner's use only

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Team Leader's use only

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**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, initials and signature. Check that you have the correct question paper.

Answer ALL the questions.

Write your answers in the spaces provided in this question paper.

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.

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1. Express  $\frac{x}{2} - \frac{x}{x+2}$  as a single fraction.

.....

(Total 2 marks)

Q1

2. Express 10 hours 30 minutes as a percentage of one day.

..... %

(Total 2 marks)

Q2

3. Rashid buys a watch in Dubai for \$45.00. Given that £1 = \$1.86, calculate the price of the watch, in £ to the nearest penny.

£ .....

(Total 2 marks)

Q3

4. Calculate the exact value of  $27^{\frac{2}{3}} - 32^{\frac{2}{5}}$ .

.....

(Total 2 marks)

Q4



5. Given that  $5\mathbf{a} - 6\mathbf{b} = (2 - p)\mathbf{a} + q\mathbf{b}$  where  $\mathbf{a}$  and  $\mathbf{b}$  are non-zero vectors which are not parallel, find the value of  $p$  and the value of  $q$ .

$p = \dots\dots\dots$

$q = \dots\dots\dots$

Q5

(Total 2 marks)

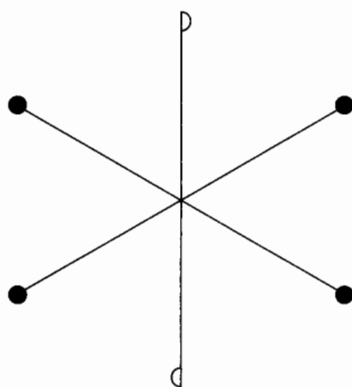
6. The  $n$ th term of a sequence is  $9n - 2$ . Write down the first three terms of the sequence.

$\dots\dots\dots$

Q6

(Total 2 marks)

7.



Write down

(a) the number of lines of symmetry of the figure,

$\dots\dots\dots$  (1)

(b) the order of rotational symmetry of the figure.

$\dots\dots\dots$  (1)

Q7

(Total 2 marks)



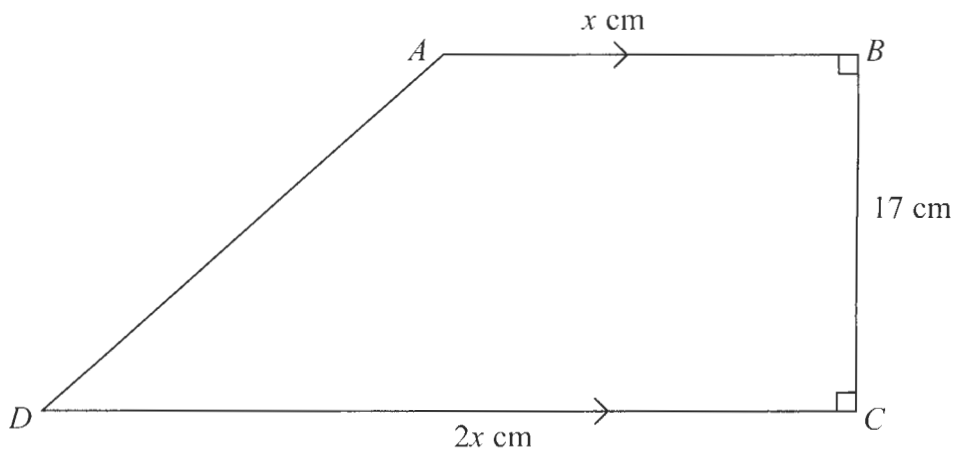
8. A straight line passes through the points (2, 9) and (4, -5). Calculate the gradient of the line.

.....

(Total 2 marks)

Q8

- 9.



$ABCD$  is a trapezium with  $AB$  parallel to  $DC$ . The side  $BC$  is perpendicular to the two parallel sides and  $AB = x$  cm,  $DC = 2x$  cm and  $BC = 17$  cm. The area of the trapezium is  $204$  cm<sup>2</sup>. Find the value of  $x$ .

$x =$  .....

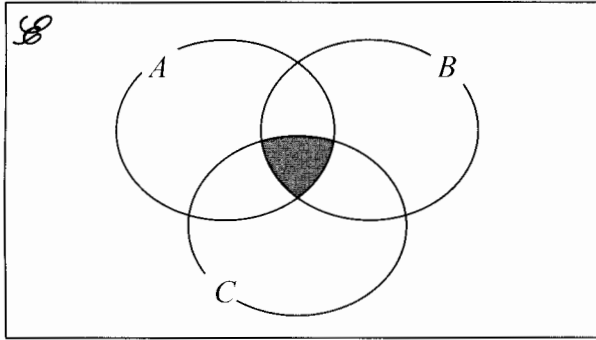
(Total 2 marks)

Q9



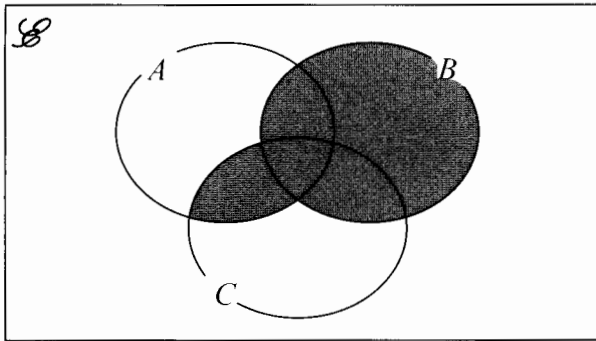
10. Describe, in set notation, the shaded region in each of the Venn diagrams below.

(a)



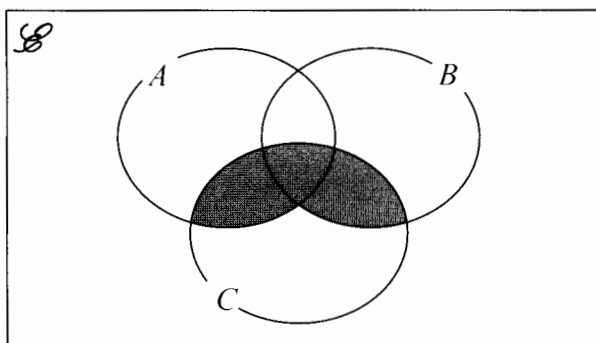
..... (1)

(b)



..... (1)

(c)



..... (1)

Q10

(Total 3 marks)

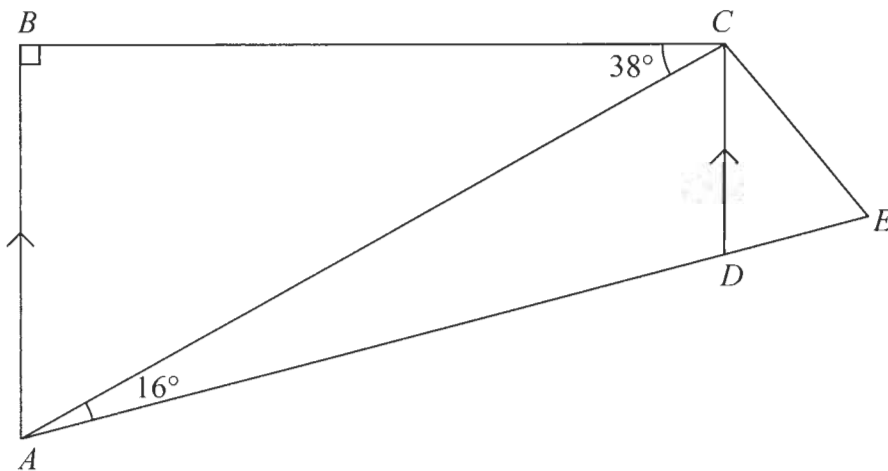


11. Given that  $\frac{4x-5}{3} < 7$  and that  $y = 5 - 2x$ , show that  $y > -8$ .

Q11

(Total 3 marks)

12.



$ABCD$  is a trapezium with  $AB$  parallel to  $DC$ ,  $\angle ABC = 90^\circ$ ,  $\angle BCA = 38^\circ$  and  $\angle CAD = 16^\circ$ .  $AD$  is extended to the point  $E$  so that  $CD = CE$ .

Find the size, in degrees, of

(a)  $\angle CAB$ ,

$\angle CAB$  .....  
(1)

(b)  $\angle DCE$ .

$\angle DCE$  .....  
(2)

Q12

(Total 3 marks)



13. A solid right circular cone has a slant height of 17cm and a base radius of 8cm. Show that the total surface area of the cone is  $200\pi \text{ cm}^2$ .

Q13

(Total 3 marks)

14. The table defines the operation  $\otimes$  on  $\{3, 5, 7, 9\}$ .

$\otimes$	3	5	7	9
3	5	7	9	3
5	7	9	3	5
7	9	3	5	7
9	3	5	7	9

(a) Write down the identity element.

.....  
(1)

(b) Evaluate  $(3 \otimes 5) \otimes 7$ .

.....  
(1)

(c) Find the value of  $x$  such that  $x \otimes (x \otimes x) = 3$ .

.....  
(1)

(Total 3 marks)

Q14



15.

$$f : x \mapsto \frac{1}{4x-1}$$

(a) Write down the value of  $x$  which **must** be excluded from the domain of  $f$ .

.....  
(1)

(b) Complete and simplify  $f^{-1} : x \mapsto \dots$

$f^{-1} : x \mapsto \dots$   
(2)

(Total 3 marks)

Q15

16. Two similar containers have heights in the ratio 1 : 5. The area of the base of the smaller container is 12 cm<sup>2</sup>.

(a) Calculate, in cm<sup>2</sup>, the area of the base of the larger container.

.....cm<sup>2</sup>  
(2)

The capacity of the larger container is 6 litres.

(b) Calculate the capacity, in litres, of the smaller container.

.....litres  
(2)

(Total 4 marks)

Q16





17. (a) Factorise  $3x^2 + 16x + 21$ .

.....  
(2)

(b) Put  $x = 20$  in this expression and then write down the prime factors of 1541.

.....  
(2)

(Total 4 marks)

Q17

18. A farmer has some sheep. The total weight of these sheep is 114 kg.  
The farmer buys three more sheep. The mean weight of these three sheep is 26 kg.  
The mean weight of all the sheep is 24 kg.  
Calculate how many sheep the farmer has after he has bought the three sheep.

.....  
(Total 4 marks)

(Total 4 marks)

Q18

19. The distance  $s$  metres travelled by a car varies as the square of the time  $t$  seconds that it has been in motion. Given that  $t = 5$  when  $s = 120$ , calculate the value of  $s$  when  $t = 3$ .

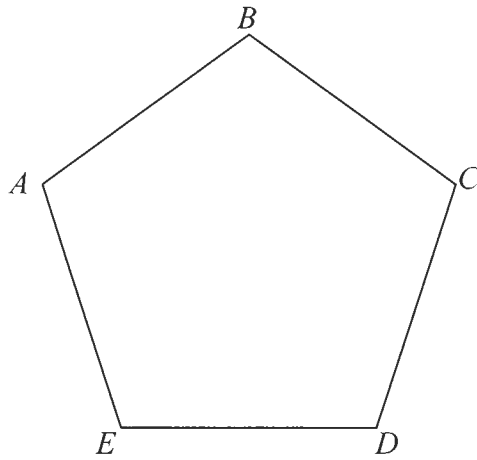
$s =$  .....

(Total 4 marks)

Q19



20.



$ABCDE$  is a regular pentagon. Calculate the size, in degrees, of

(a)  $\angle ABC$ ,

$\angle ABC$  .....<sup>o</sup>  
(2)

(b)  $\angle CAD$ .

$\angle CAD$  .....<sup>o</sup>  
(3)

(Total 5 marks)

Q20

21. Given that  $a = \sqrt{\left(\frac{b+c}{b-c}\right)}$ , express  $c$  in terms of  $a$  and  $b$ .

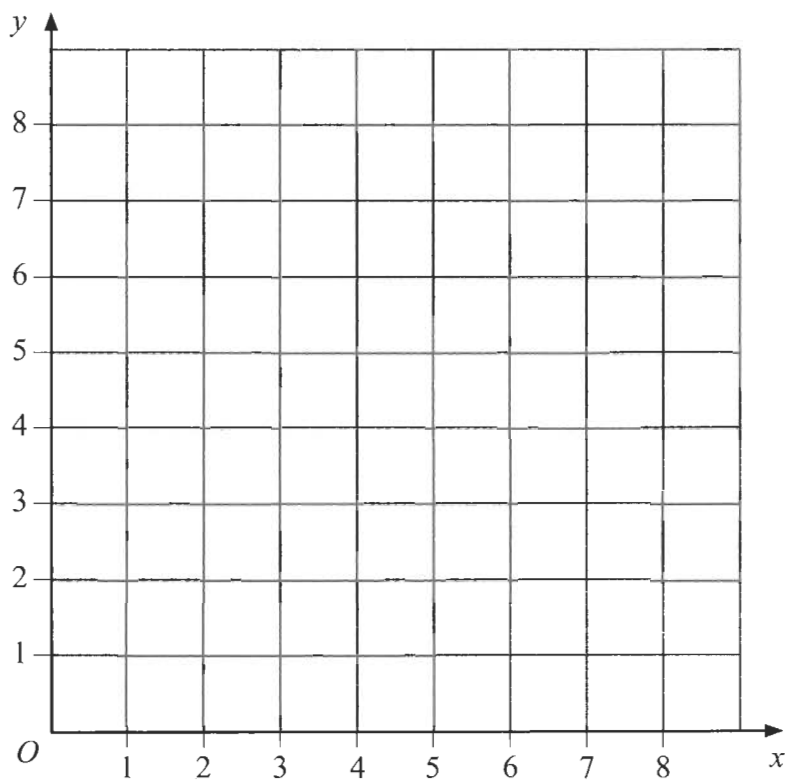
$c =$  .....

(Total 5 marks)

Q21



22.



$A(1, 4)$  and  $C(8, 5)$  are two opposite vertices of a square  $ABCD$ .

- (a) On the grid, draw the square  $ABCD$ . (3)
- (b) Calculate the exact length of one side of the square. (2)

.....  
 (Total 5 marks)

Q22



23. A company employs 20 workers who are each paid £280 per week. The company also employs 2 supervisors who are each paid £360 per week.

(a) Calculate, in £, the total weekly wage bill.

£ .....  
(1)

The number of workers is reduced to 15 and the number of supervisors is reduced to one. The 15 workers are each given a 10% pay rise and the one supervisor is given a 25% pay rise.

(b) Calculate, in £, the **saving** in the total weekly wage bill.

£ .....  
(2)

(c) Express this saving as a percentage of the original total wage bill. Give your answer to 3 significant figures.

..... %  
(2)

(Total 5 marks)

Q23

24. The determinant of the matrix  $\begin{pmatrix} 2 & x & -1 \\ x & & 1 \end{pmatrix}$  is  $-4$ . Calculate the values of  $x$ .

.....

(Total 5 marks)

Q24



25.



A ship *S* leaves the port *P* at 12 00 and travels on a bearing of  $060^\circ$  at an average speed of 32 km/h for 2 hours. The ship *S* is now at position *A*. Using a scale of 1 cm to represent 20 km,

- (a) in the space above, draw accurately the path of ship *S* and label the position *A*. (1)

A second ship *T* also leaves the port *P* at 12 00 and travels on a bearing of  $140^\circ$  at an average speed of 24 km/h for 2 hours. The ship *T* is now at position *B*. Using the same scale and on the same diagram,

- (b) draw accurately the path of ship *T* and label the position *B*. (1)

- (c) Find by measurement, the distance, in km to the nearest km, between *A* and *B*.

.....km  
(1)

- (d) Find by measurement, the bearing, in degrees to the nearest degree, of *B* from *A*.

.....  
(2)

**(Total 5 marks)**

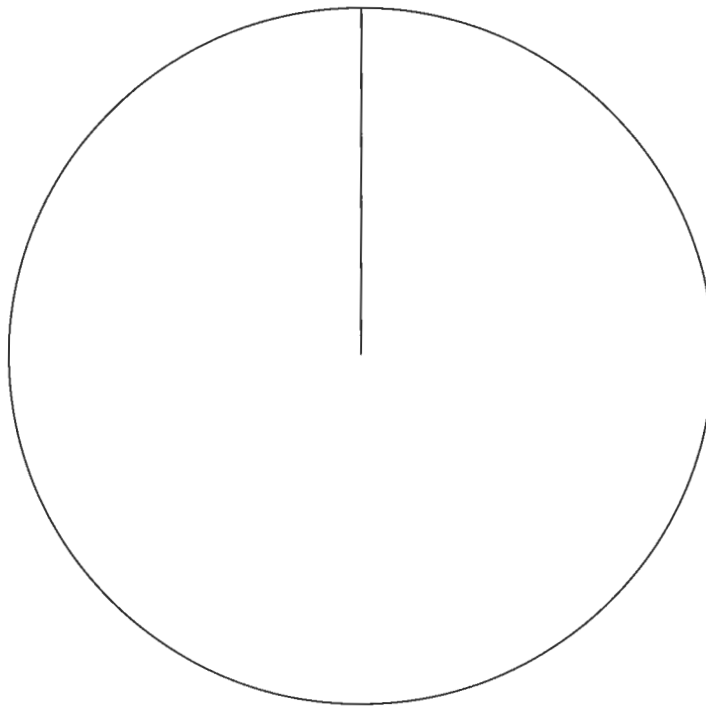
Q25



26. A pie chart is to be drawn to show the proportions of the selling price of a book received by the author, publisher, printer and bookseller when the book is sold. The printer receives 15% of the selling price of the book.

- (a) Calculate the size, in degrees, of the angle of the sector representing the proportion received by the printer.

.....  
(2)



The remaining proportions of the selling price are

Author	10%
Publisher	20%
Bookseller	55%

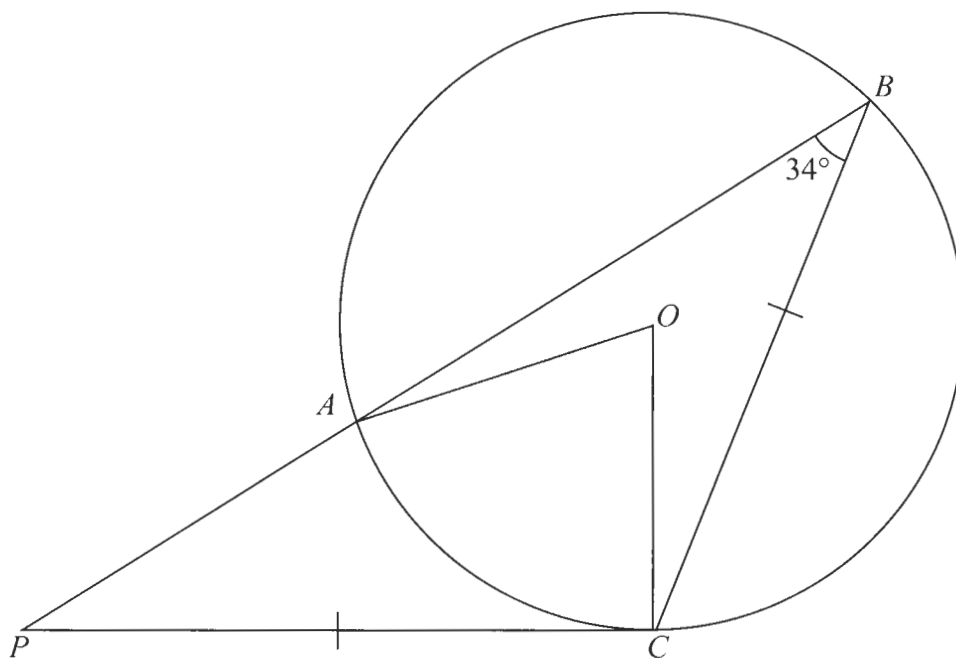
- (b) Using the circle, draw accurately the pie chart. On the pie chart, state the size of the angle of each sector.

(3) **Q26**

(Total 5 marks)



27.



$O$  is the centre of circle  $ABC$ . The point  $P$  is such that  $BAP$  is a straight line and  $PC$  is the tangent to the circle at  $C$ , with  $PC = CB$  and  $\angle PBC = 34^\circ$ . Calculate the size, in degrees, of

(a)  $\angle AOC$ ,

$\angle AOC$  ..... (1)

(b)  $\angle BAO$ ,

$\angle BAO$  ..... (3)

(c)  $\angle BCO$ .

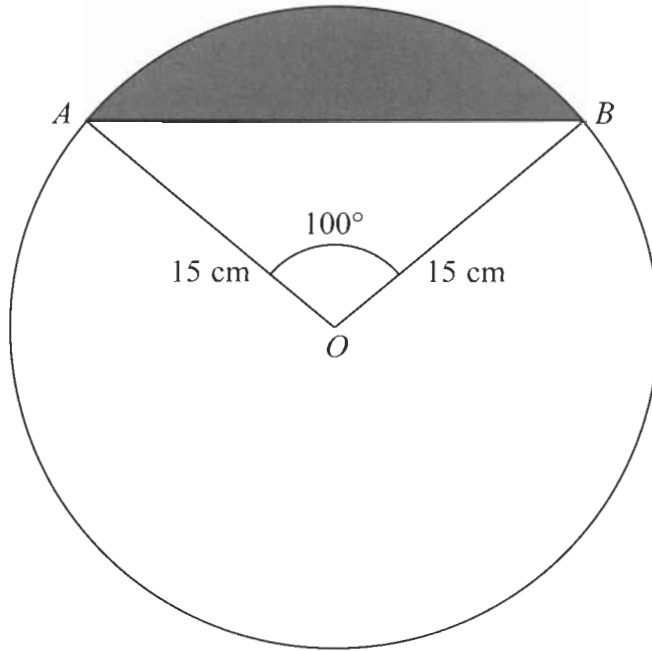
$\angle BCO$  ..... (2)

(Total 6 marks)

Q27



28.



A circle, centre  $O$ , has radius 15 cm. The chord  $AB$  subtends an angle of  $100^\circ$  at the centre of the circle.

(a) Calculate the perimeter, in cm to 3 significant figures, of the shaded region.

..... cm  
(4)

(b) Calculate the area, in  $\text{cm}^2$  to 3 significant figures, of the shaded region.

.....  $\text{cm}^2$   
(3)

(Total 7 marks)

Q28

TOTAL FOR PAPER: 100 MARKS

END

