

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 5 May 2009 – Afternoon

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 20 pages in this question paper. Any blank pages are indicated.

**Advice to Candidates**

Write your answers neatly and legibly.

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<p>1. Showing all your working, find, in its simplest form</p> $2\frac{6}{11} \div 3\frac{1}{2}$ <p>.....</p> <p style="text-align: right;"><b>(Total 2 marks)</b></p>	<p>Leave blank</p> <p style="text-align: right;"><b>Q1</b></p> <input style="width: 20px; height: 20px;" type="text"/>
<p>2. Find the Lowest Common Multiple (LCM) of 48, 54 and 60.</p> <p>.....</p> <p style="text-align: right;"><b>(Total 2 marks)</b></p>	<p style="text-align: right;"><b>Q2</b></p> <input style="width: 20px; height: 20px;" type="text"/>
<p>3. Factorise <math>xy + 3y - 7x - 21</math>.</p> <p>.....</p> <p style="text-align: right;"><b>(Total 2 marks)</b></p>	<p style="text-align: right;"><b>Q3</b></p> <input style="width: 20px; height: 20px;" type="text"/>



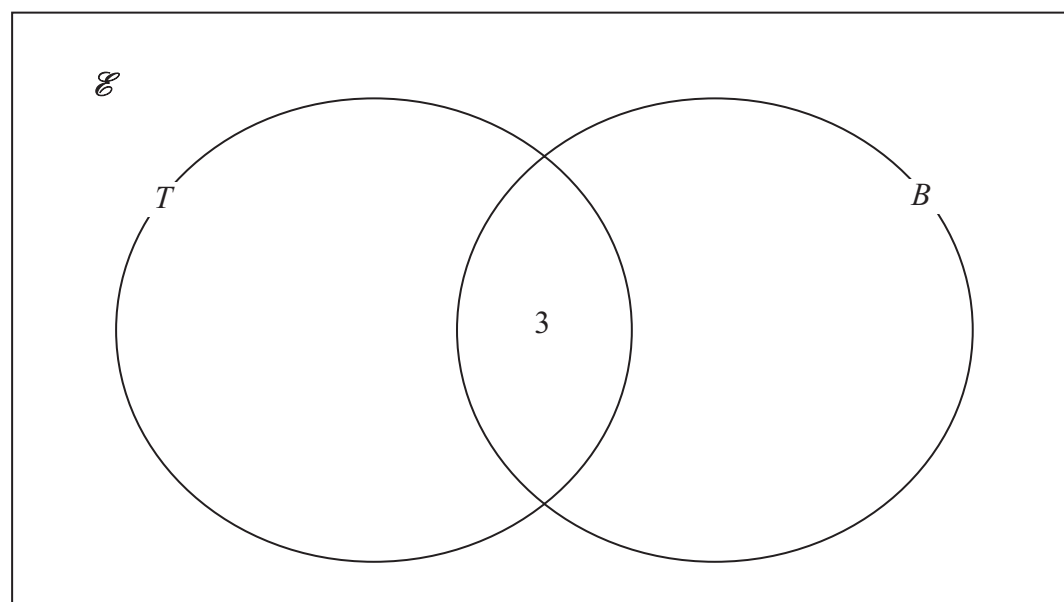
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4. The size of each external angle of a regular polygon is  $22.5^\circ$ .  
Find the number of sides of the polygon.

Q4

(Total 2 marks)

5.



A group of 56 tourists visiting London were asked which historic sites they had visited. 27 had said that they had visited the *Tower of London* ( $T$ ), 22 said that they had visited *Buckingham Palace* ( $B$ ) and 3 said that they had visited both the *Tower of London* and *Buckingham Palace*.

Complete the diagram above to show this information.

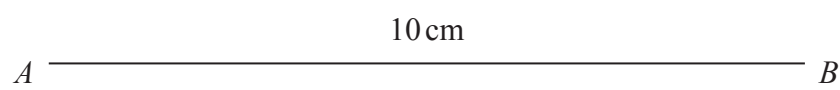
Q5

(Total 2 marks)



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6.



*AB* is a straight line of length 10 cm.  
Draw the complete locus of points in the plane which are 2 cm from the line *AB*.

(Total 2 marks)

Q6

7. Simplify  $\frac{3 \times 10^{-6}}{8 \times 10^7}$  giving your answer in standard form.

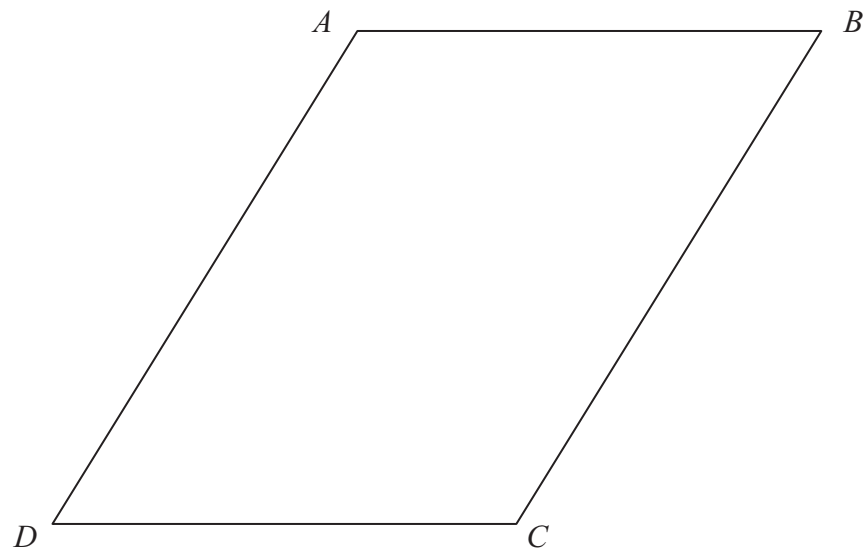
(Total 2 marks)

Q7



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8.



$ABCD$  is a parallelogram.

(a) Write down the number of lines of symmetry of  $ABCD$ .

.....  
(1)

(b) Write down the order of rotational symmetry of  $ABCD$ .

.....  
(1)

(Total 2 marks)

Q8

9. Expand and simplify  $\frac{x}{4}(5x - 7) - \frac{x}{2}(3x - 2)$ .

.....

(Total 3 marks)

Q9

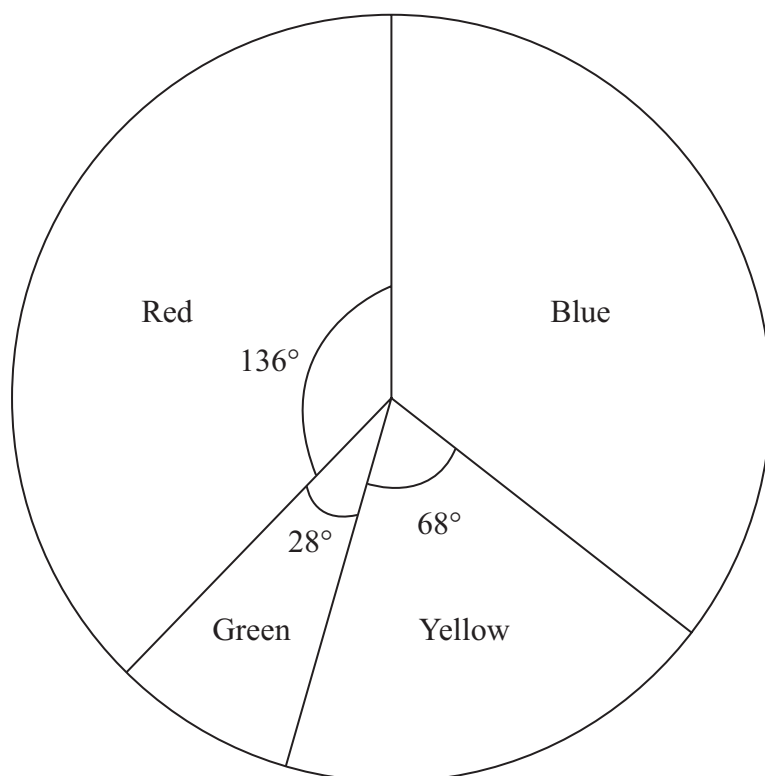
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10.

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In a survey, some students were asked which one of the four colours, red, blue, green and yellow they found most attractive.  
All students surveyed chose one of the four colours.  
The pie chart shows information about their answers.

Given that 352 students said that blue was the most attractive colour, find the total number of students who took part in the survey.

.....  
Q10

(Total 3 marks)



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11. When Shahnaz visited China, the exchange rate was £1 = 15 Chinese Yuan (CNY). In China, Shahnaz bought 3 pictures at a cost of 70CNY each and 5 ornaments at 80CNY each.

Calculate the total cost, in £, of all these items. Give your answer to the nearest p.

£ .....

(Total 3 marks)

Q11

12. Find all the integer values of  $x$  which satisfy

$$2x - 5 < 3 + 4x < 12 + x.$$

.....

(Total 3 marks)

Q12

13. Find the value of

(a)  $9^{-\frac{3}{2}}$ ,

.....  
(1)

(b)  $(27^{-1})^0$ ,

.....  
(1)

(c)  $243^{\frac{3}{5}}$ .

.....  
(1)

(Total 3 marks)

Q13



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14.  $t = \sqrt{\left(\frac{2s}{g}\right)}$ .

Express  $g$  in terms of  $s$  and  $t$ .

$g = \dots\dots\dots$

Q14

(Total 3 marks)

15.  $\vec{OA} = \begin{pmatrix} 5 \\ 11 \end{pmatrix}$        $\vec{OB} = \begin{pmatrix} 3 \\ -1 \end{pmatrix}$

Given that  $C$  is the midpoint of  $AB$ , find  $\vec{AC}$ .

$\vec{AC} = \dots\dots\dots$

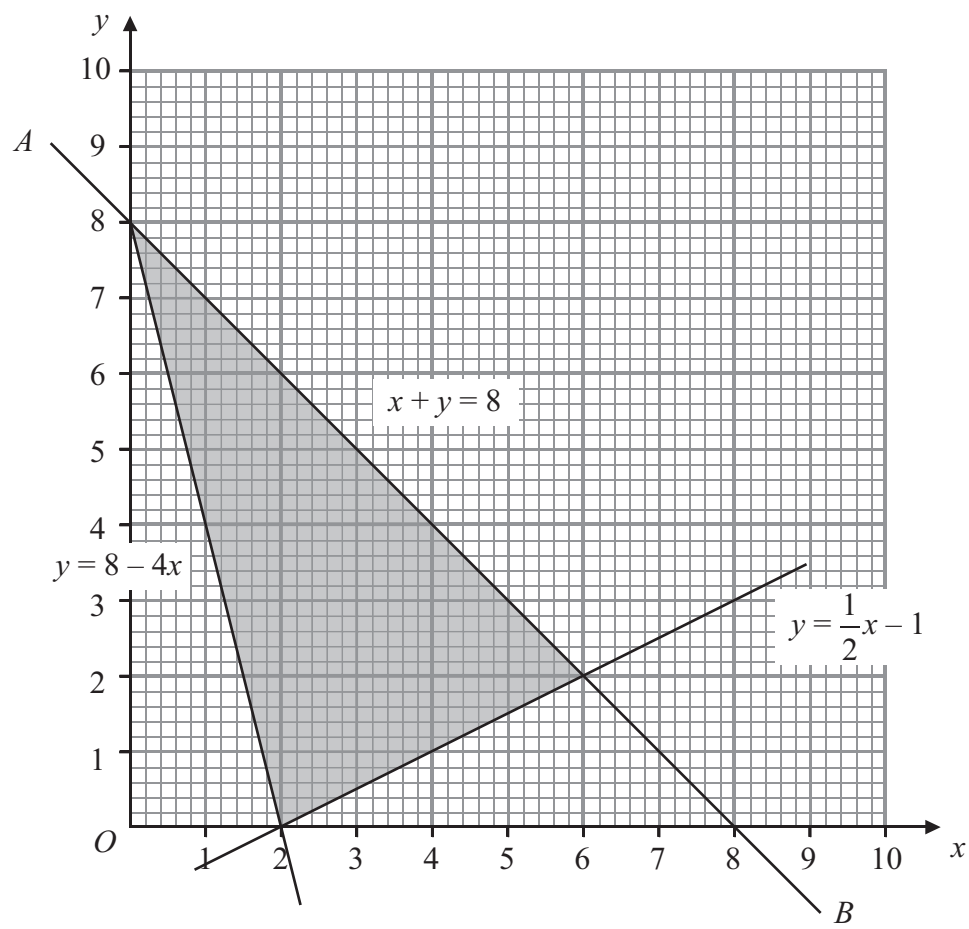
Q15

(Total 3 marks)





16.



The equation of the line  $AB$  is  $x + y = 8$

(a) Find the gradient of the line  $AB$ .

.....  
(1)

(b) Write down the three inequalities which define the shaded region.

.....  
.....  
.....  
(3)

(Total 4 marks)

Q16



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17. (a) Calculate 22% of £2280

£ .....  
(2)

Lois Denominator, a mathematics examiner, receives £514.80 after tax has been deducted at 22% for marking papers.

(b) Calculate Lois' pay before the tax had been deducted.

£ .....  
(2)

(Total 4 marks)

Q17

18. The number of passengers in each of 90 vehicles was recorded and information about the results is shown in the table.

Number of passengers	0	1	2	3	4	5
Number of vehicles	26	20	24	15	3	2

(a) Calculate the mean number of passengers per car.

.....  
(3)

(b) Find the median number of passengers.

.....  
(1)

(Total 4 marks)

Q18



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19. Given that  $p * q = p - 2q$ ,

(a) calculate the value of  $3 * (-2)$

.....  
(1)

(b) find  $x$  such that

$$(x * 5) * x = x.$$

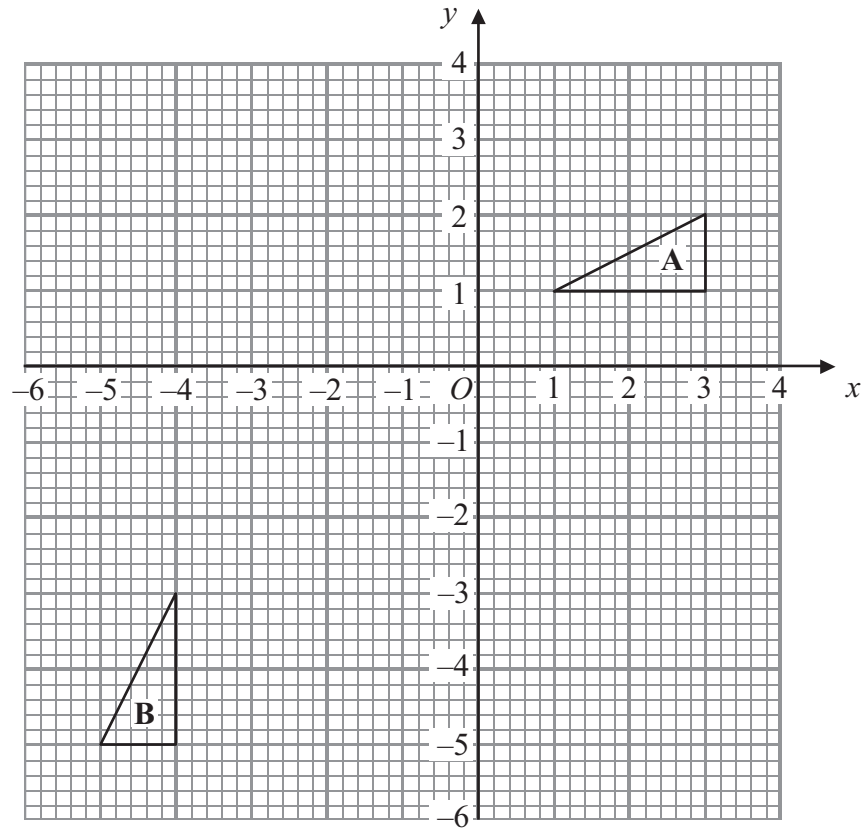
.....  
(3)

(Total 4 marks)

Q19



20.



Triangle **B** is the image of triangle **A** under the combined transformation of a reflection in the line  $y = -x$  followed by a translation.

- (a) On the diagram draw and label the line  $y = -x$ . (1)
- (b) On the diagram draw the image of triangle **A** after a reflection in the line  $y = -x$ . Label this image **C**. (1)
- (c) Describe the translation which maps triangle **C** onto triangle **B**.

.....  
 .....

(2)

Q20

(Total 4 marks)



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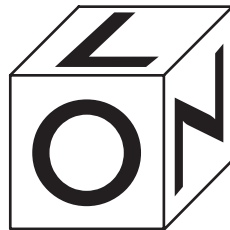
21. Given that  $\tan x^\circ = \frac{8}{15}$  and  $0 < x < 90$ , calculate, as a fraction, the value of

$$\sin x^\circ + \cos x^\circ.$$

.....  
Q21

(Total 4 marks)

22. The numbers on a fair six-sided die are replaced with the letters L, O, N, D, O and N.



The die is to be rolled twice.

Calculate the probability of

(a) at least one N,

.....  
(2)

(b) two letters being the same.

.....  
(3)

Q22

(Total 5 marks)



Leave  
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23. The length of one lap of a motor race track is 5.2 km.

There are 56 laps in a race.

(a) Calculate the length, in m, of the race.

..... m  
(2)

The winner completes the race in 1 hour 25 minutes.

(b) Calculate the average speed of the winner.  
Give your answer in m/s to 3 significant figures.

..... m/s  
(3)

Q23

(Total 5 marks)



Leave  
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24. The attendance at a cricket match was 7000.  
There were  $x$  adults and  $y$  children at the match.

(a) Express this information as an equation in  $x$  and  $y$ .

.....  
(1)

The price of an adult ticket for the match was £20 and the price of a child's ticket was £8.  
The total income from selling tickets was £123 200.

(b) Express this information as another equation in  $x$  and  $y$ .

.....  
(1)

(c) Solve your two equations to find the number of adults and the number of children at the match.

.....  
(3)

(Total 5 marks)

Q24



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blank

25. A particle moves along a straight line such that its displacement,  $x$  metres, from a fixed point  $O$  of the line at time  $t$  seconds is given by  $x = t - \frac{16}{t}$ , for  $t \geq 1$

Calculate

(a) the value of  $t$  when the particle is at  $O$ ,

.....  
(2)

(b) the velocity, in m/s, of the particle when  $t = 5$

.....  
(3)

(Total 5 marks)

Q25

26. (a) Given that  $(x-3)$  is a factor of  $3x^3 + 8x^2 + kx - 60$ , find the value of the constant  $k$ .

$k =$  .....  
(2)

(b) Hence, or otherwise, factorise completely  $3x^3 + 8x^2 + kx - 60$

.....  
(4)

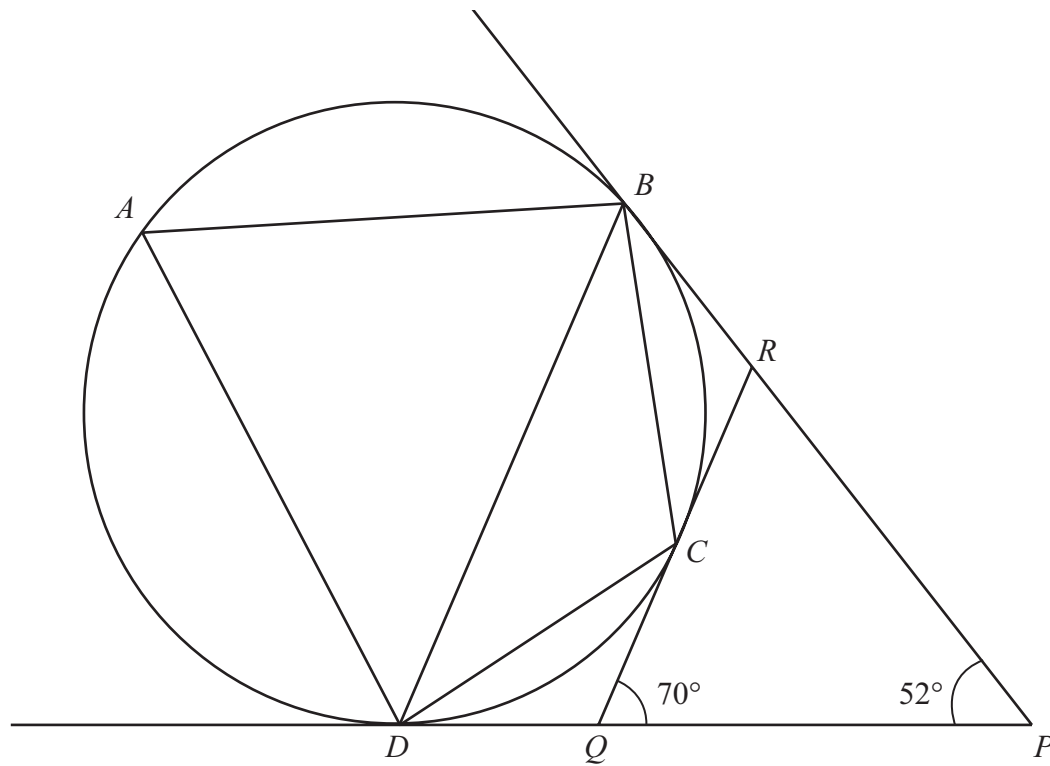
(Total 6 marks)

Q26





27.



In the diagram,  $A$ ,  $B$ ,  $C$  and  $D$  are four points on a circle. The tangents to the circle at  $B$  and  $D$  meet at  $P$  so that  $\angle BPD = 52^\circ$ . The tangent to the circle at  $C$  meets  $BP$  at  $R$  and  $DP$  at  $Q$  so that  $\angle RQP = 70^\circ$ .

Find the size, in degrees of

(a)  $\angle DBC$ ,

$\angle DBC = \dots\dots\dots^\circ$   
(2)

(b)  $\angle CDB$ ,

$\angle CDB = \dots\dots\dots^\circ$   
(2)

(c)  $\angle BAD$ .

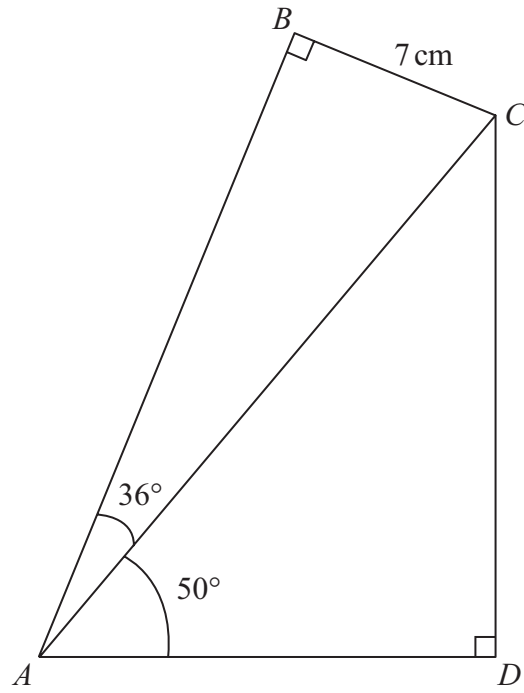
$\angle BAD = \dots\dots\dots^\circ$   
(2)

(Total 6 marks)

Q27



28.



In the diagram,  $ABCD$  is a quadrilateral and  $BC = 7$  cm.  
 $\angle ABC = \angle CDA = 90^\circ$ ,  $\angle CAD = 50^\circ$  and  $\angle BAC = 36^\circ$ .  
 Calculate, giving your answers to 3 significant figures,

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

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

(b) the length, in cm, of  $AD$ ,

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

(c) the area, in  $\text{cm}^2$ , of  $ABCD$ .

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

Q28

(Total 7 marks)

TOTAL FOR PAPER: 100 MARKS

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