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 10 May 2010 – 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, 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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1. Express 37.5 cm as a fraction of one metre giving your answer in its simplest form.

.....

Q1

(Total 2 marks)

2. Write down the next two terms of the sequence

–2, 6, –18, 54, –162, 486, ..., ...

.....

Q2

(Total 2 marks)

3. The three angles of a triangle are in the ratio 1 : 4 : 7

Calculate the size, in degrees, of the largest angle.

.....°

Q3

(Total 2 marks)

Leave blank

4. Factorise completely $3x^2 - 12y^2$

.....

(Total 2 marks)

Q4

5. In Pleuville, whether it will rain on any day is independent of whether it rains on any other day.
The probability that it will rain on any day is 0.6

Calculate the probability that next week it will rain on Monday, not rain on Tuesday and rain on Wednesday.

.....

(Total 2 marks)

Q5

6. A train left Stenworth at 13 20 to travel the 50 km to Beedtown. The train travelled at an average speed of 40 km/h. Calculate the time at which the train arrived at Beedtown.

.....

(Total 2 marks)

Q6

Leave blank

7. Each exterior angle of a regular polygon is $7\frac{1}{2}°$

Calculate the number of sides of the polygon.

.....

(Total 2 marks)

Q7

8.

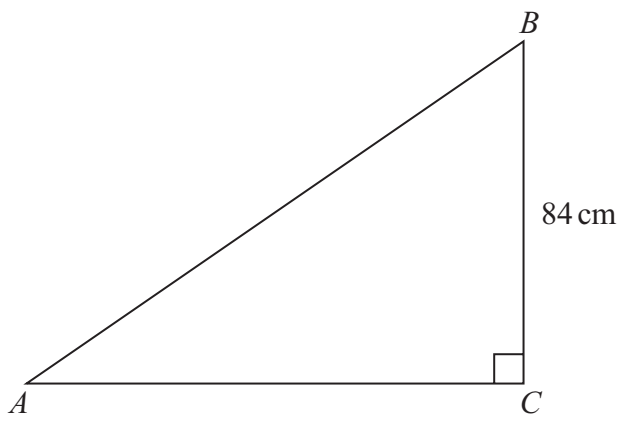


Diagram **NOT** accurately drawn

In the triangle $\angle BCA = 90°$ and $BC = 84$ cm.

Given that $\cos \angle ABC = 0.8$, calculate the length, in cm, of AB.

..... cm

(Total 2 marks)

Q8

Leave blank

9. $a * b = a + b - ab$.

Find the value of (2 * 3) * 4

.....

(Total 2 marks)

Q9

10. $\mathscr{E}$ = {positive integers less than or equal to 12},

A = {factors of 12},

B = {multiples of 2}.

Write down the elements of the set

(a) A,

.....

(1)

(b) B',

.....

(1)

(c) $A \cap B'$

.....

(1)

(Total 3 marks)

Q10

Leave blank

11. Muni buys a television set which is on sale in a shop for £150
A tax of 17.5% is added to this price.

Calculate the total price, in £, that Muni pays for the television set.

£ .....

(Total 3 marks)

Q11

12. The Earth travels around the Sun at a speed of 30 kilometres per second.
Given that a year is 365 days, calculate the distance, in km, travelled by the Earth around the Sun in one year.
Give your answer to 3 significant figures.

..... km

(Total 3 marks)

Q12

13. Express as a single fraction $\frac{2}{(x-3)} - \frac{3}{(x+2)}$.

.....

(Total 3 marks)

Q13

Leave blank

14. The volume of a right circular cylinder is 2916π cm^3.
The height of the cylinder is four times the radius of the base.

Calculate the radius, in cm, of the base.

..... cm

(Total 3 marks)

Q14

15. (a) Evaluate $\frac{1}{25^{-\frac{3}{2}}}$.

.....

(2)

(b) Write your answer to part (a) in standard form.

.....

(1)

(Total 3 marks)

Q15

Leave blank

16.

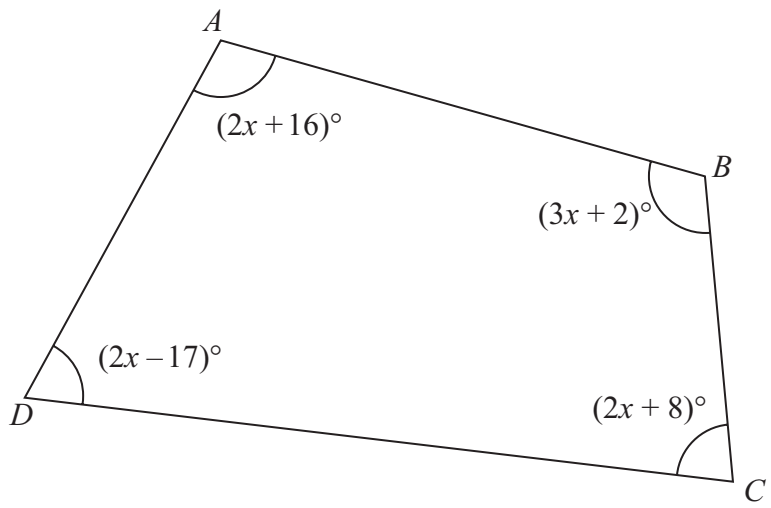


Diagram **NOT** accurately drawn

ABCD is a quadrilateral.

(a) Calculate the value of *x*.

.....

(2)

(b) Explain why *ABCD* is a cyclic quadrilateral.

.....

.....

.....

.....

(1)

Q16

(Total 3 marks)

Leave blank

17. Simplify completely $(x - y)(y + z) - (x + y)(y - z)$.

.....

Q17

(Total 3 marks)

18. $\frac{1}{f} = \frac{1}{u} - \frac{1}{v}$

Find u in terms of f and v.

.....

Q18

(Total 4 marks)

Turn over

Leave blank

19.

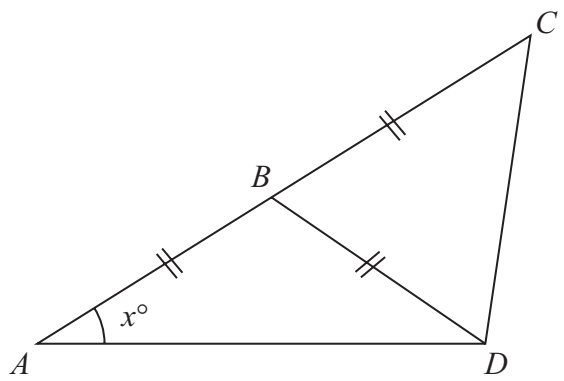


Diagram **NOT** accurately drawn

In the diagram, ABC is a straight line and $AB = BD = BC$ and $\angle BAD = x°$

(a) Find, in terms of x, the size of $\angle CBD$.

.....

(2)

(b) Show that $\angle CDA = 90°$.

.....

.....

.....

.....

.....

.....

.....

.....

(2)

Q19

(Total 4 marks)

Leave blank

20. At time t seconds, the rate of flow of water, R cm/s, through a pipe is given by
$R = 15t^2 - 120t + 250$

Find the value of t for which R is a minimum.

$t =$ .....

(Total 4 marks)

Q20

21. $f : x \mapsto x^2 - 4$

$g : x \mapsto 3x - 2$

Solve the equation $fg(x) = 0$

.....

(Total 4 marks)

Q21

Leave blank

22. The mean of the eight numbers 6, 7, 8, 9, 9, 9, x, y is 11.7

(a) Show that $x + y = 45.6$

.....

.....

.....

.....

.....

.....

.....

.....

(2)

Given also that $y - x = 17.2$

(b) calculate the value of x and the value of y.

$x =$ ....., $y =$ .....

(3)

(Total 5 marks)

Q22

Leave blank

23. Solve $x = 3 + \frac{7}{2x}$ giving your solutions correct to 2 decimal places.

.....

Q23

(Total 6 marks)

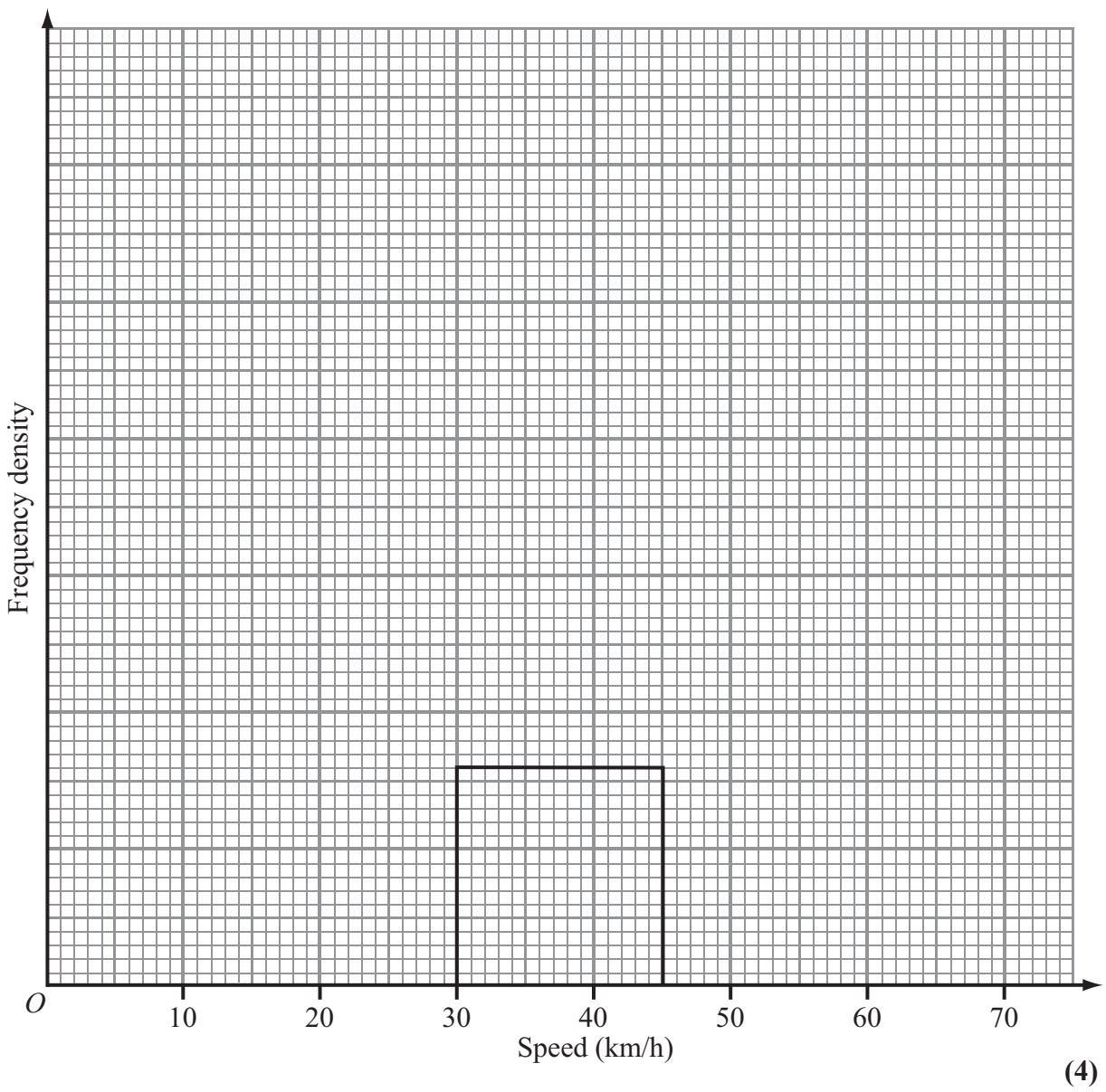
Leave blank

24. A road has a speed limit of 45 km/h.
The speeds of 100 cars passing a point on this road were recorded. The table gives information about these speeds.

Recorded Speed (x km/h)	$15 < x \leqslant 30$	$30 < x \leqslant 45$	$45 < x \leqslant 50$	$50 < x \leqslant 55$	$55 < x \leqslant 70$
Number of cars	15	24	22	30	9

The diagram below is a partially completed histogram to represent this information.

(a) Complete the histogram to show this information.



(4)

Leave blank

A car is to be chosen at random from these 100 cars.

(b) Write down the probability that this car was travelling faster than the speed limit.

.....

(1)

Q24

(Total 5 marks)

Leave blank

25.

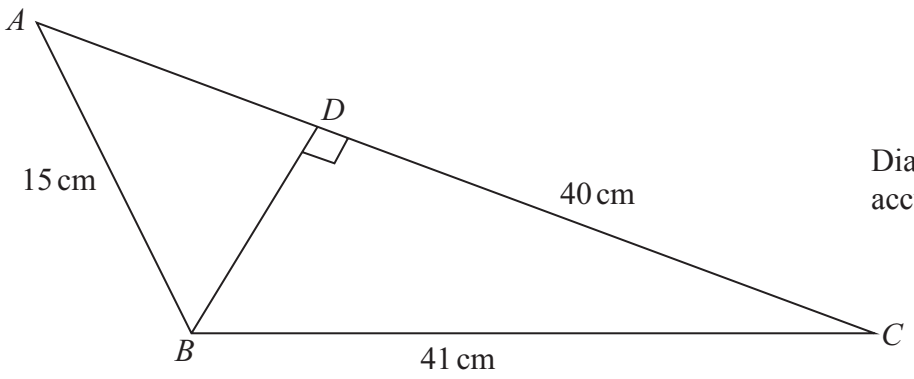


Diagram **NOT** accurately drawn

In the diagram, *ADC* is a straight line, *DC* = 40 cm, *BC* = 41 cm and *AB* = 15 cm. *BD* is perpendicular to *AC*.

Calculate the area, in cm^2, of Δ *ABC*.

..... cm^2

(Total 6 marks)

Q25

Leave blank

26.

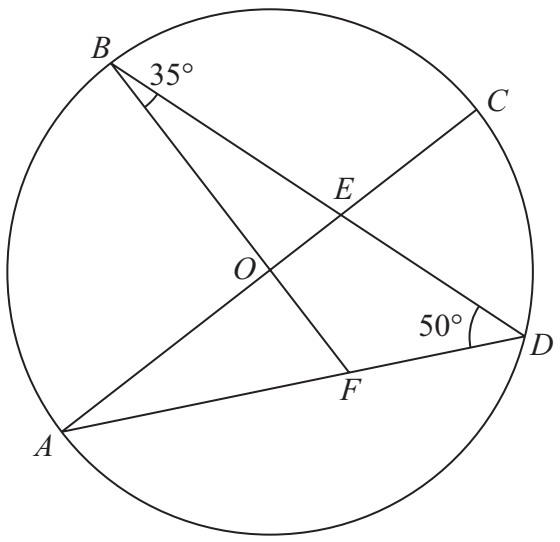


Diagram **NOT** accurately drawn

In the diagram, $ABCD$ is a circle centre O.
The point F lies on AD where $\angle FBD = 35°$ and $\angle BDF = 50°$.

BF and AC intersect at O, BD and AC intersect at E and $AOEC$ is a straight line.

Find, giving your reasons in full, the size, in degrees, of

(a) $\angle FOE$,

$\angle FOE =$ .....

(3)

(b) $\angle AED$.

$\angle AED =$ .....

(3)

Q26

(Total 6 marks)

Leave blank

27.

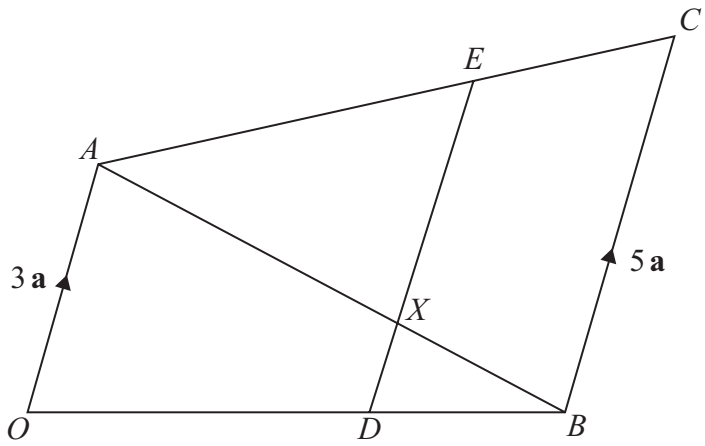


Diagram **NOT** accurately drawn

In the diagram, $OACB$ is a trapezium where $\overrightarrow{OA} = 3\mathbf{a}$, $\overrightarrow{BC} = 5\mathbf{a}$ and $\overrightarrow{OB} = 3\mathbf{b}$.

(a) Write down in terms of **a** and **b** the vector $\overrightarrow{AB}$.

.....

(1)

Given that $\overrightarrow{AX} = \lambda \overrightarrow{AB}$,

(b) write down, in terms of **a**, **b** and λ, the vector $\overrightarrow{OX}$.

.....

(1)

The point D lies on OB such that $OD : DB = 2 : 1$

Given also that DX is parallel to OA and BC so that $\overrightarrow{DX} = \mu\,\mathbf{a}$,

(c) write down, in terms of **a**, **b** and μ, the vector $\overrightarrow{OX}$.

.....

(2)

(d) Using your answers to parts (b) and (c), determine the value of λ and the value of μ.

Leave blank

λ = ...

μ = ...

(3)

Q27

(Total 7 marks)

Leave blank

28.

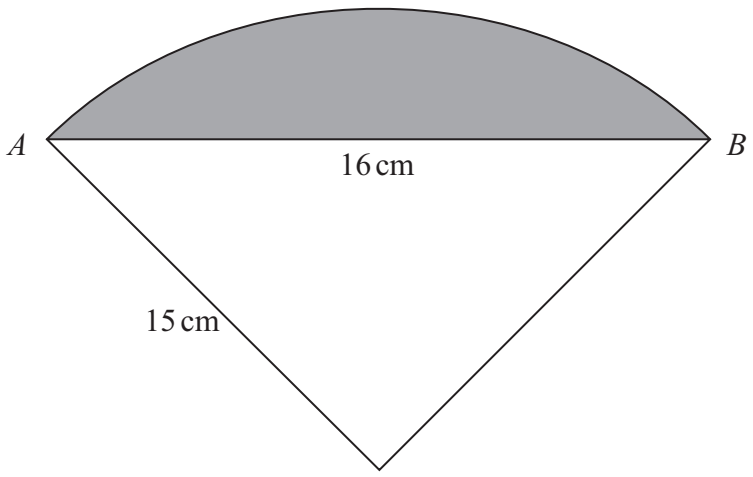


Diagram **NOT** accurately drawn

OAB is a sector of a circle centre *O*, radius 15 cm and *AB* = 16 cm.

Calculate, to 3 significant figures,

(a) the size, in degrees, of $\angle AOB$,

$\angle AOB$ = ...

(3)

(b) the area, in cm^2, of the shaded region.

..... cm^2

(4)

Q28

(Total 7 marks)

TOTAL FOR PAPER: 100 MARKS

END