



Surname _____

Other Names _____

Centre Number _____

Candidate Number _____

Candidate Signature _____

GCSE MATHEMATICS

H

Higher Tier Paper 1 Non-Calculator

8300/1H

Thursday 2 November 2017

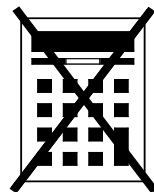
Morning

Time allowed: 1 hour 30 minutes

For this paper you must have:

- mathematical instruments.

You must NOT use a calculator.



At the top of the page, write your surname and other names, your centre number, your candidate number and add your signature.

[Turn over]



N 0 V 1 7 8 3 0 0 1 H 0 1

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INSTRUCTIONS

- **Use black ink or black ball-point pen. Draw diagrams in pencil.**
- **Answer ALL questions.**
- **You must answer the questions in the spaces provided. Do not write on blank pages.**
- **Do all rough work in this book. Cross through any work you do not want to be marked.**

INFORMATION

- **The marks for questions are shown in brackets.**
- **The maximum mark for this paper is 80.**
- **You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.**

ADVICE

- **In all calculations, show clearly how you work out your answer.**

DO NOT TURN OVER UNTIL TOLD TO DO SO



Answer ALL questions in the spaces provided.

1 Work out $\sqrt{2^6 + 6^2}$

Circle your answer. [1 mark]

10

14

50

100

2 What is 800 million in standard form?

Circle your answer. [1 mark]

800×10^6

8×10^8

8×10^9

0.8×10^{10}

**3 Circle the expression that is equivalent to $(4a^5)^2$
[1 mark]**

$16a^{10}$

$16a^7$

$8a^{10}$

$8a^7$



4 $y = \frac{10}{x}$

If the value of x doubles, what happens to the value of y ?

Circle your answer. [1 mark]

$\div 2$

$\times 2$

$\div 5$

$\times 5$

5 (a) Factorise $x^2 - 100$ [1 mark]

Answer

[Turn over]



5 (b) Solve $7x + 6 > 1 + 2x$ [2 marks]

Answer _____

7



6 Work out the value of $(\sqrt{3})^2 \times (\sqrt{2})^2$ [2 marks]

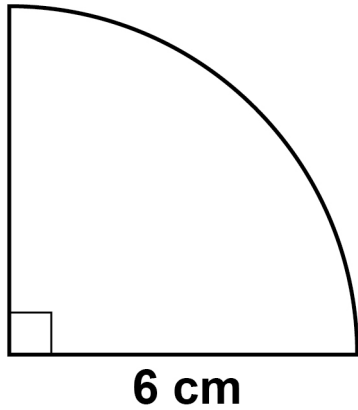
Answer

[Turn over]



7 Here is a quarter circle of radius 6 cm

It is not drawn accurately.



Work out the area of the quarter circle.

Give your answer in terms of π . [2 marks]

Answer _____ cm^2

- 8 Three WHOLE numbers are each rounded to the nearest 10

The sum of the rounded numbers is 70

Work out the MAXIMUM possible sum for the original three numbers. [2 marks]

Answer _____

[Turn over]



- 9 Circle the expression for the range of n consecutive integers. [1 mark]

$$\frac{n+1}{2}$$

$$n-1$$

$$n$$

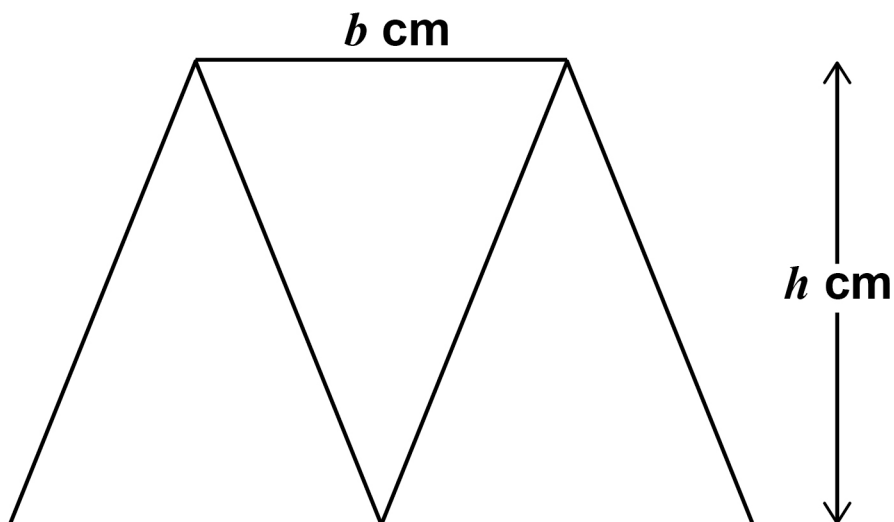
$$n+1$$

7

- 10 Three identical isosceles triangles are joined to make this trapezium.

They are not drawn accurately.

Each triangle has base b cm and perpendicular height h cm



- 10 (a) Work out an expression, in terms of b and h , for the area of the trapezium.

Give your answer in its simplest form. [2 marks]

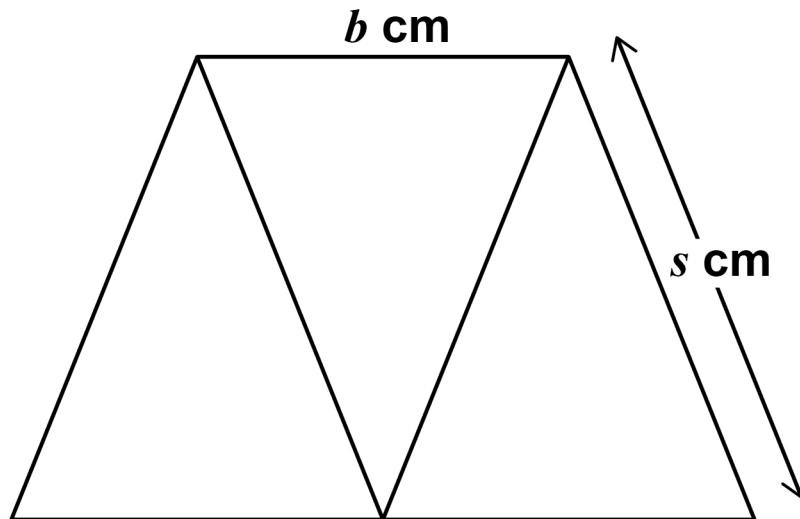
Answer _____ cm^2

[Turn over]



10 (b) This diagram shows the same trapezium.

It is not drawn accurately.



$$b : s = 2 : 3$$



Work out an expression, in terms of b , for the perimeter of the trapezium. [2 marks]

Answer _____ cm

4

[Turn over]

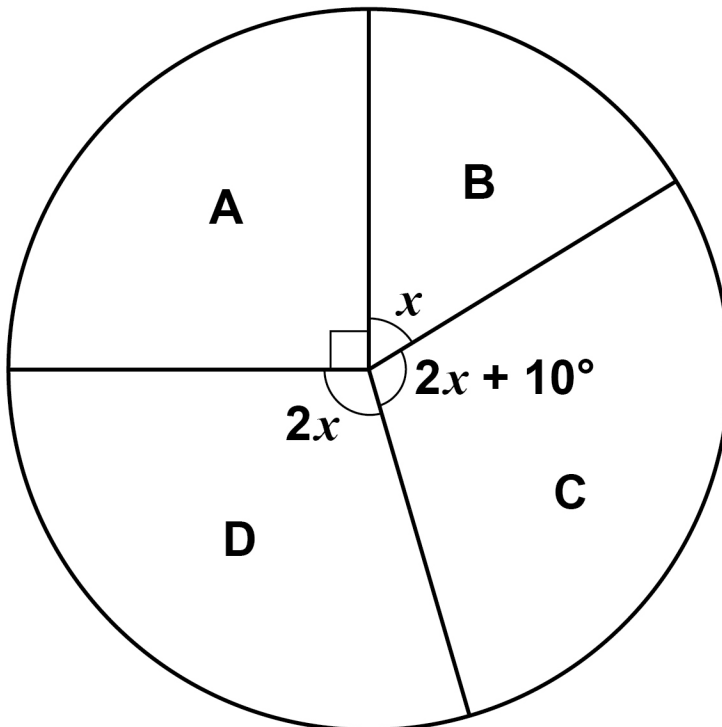


- 11 The four candidates in an election were A, B, C and D.

The pie chart shows the proportion of votes for each candidate.

It is not drawn accurately.

Proportion of votes



Work out the probability that a person who voted, chosen at random, voted for C. [4 marks]

[illegible]

Answer

[Turn over]



- 12 Use approximations to 1 significant figure to estimate the value of

$$\frac{0.526 \times 39.6^2}{\sqrt{97.65}}$$

You MUST show your working. [3 marks]

Answer

7



13 $x : y = 7 : 4$

$$x + y = 88$$

Work out the value of $x - y$ [3 marks]

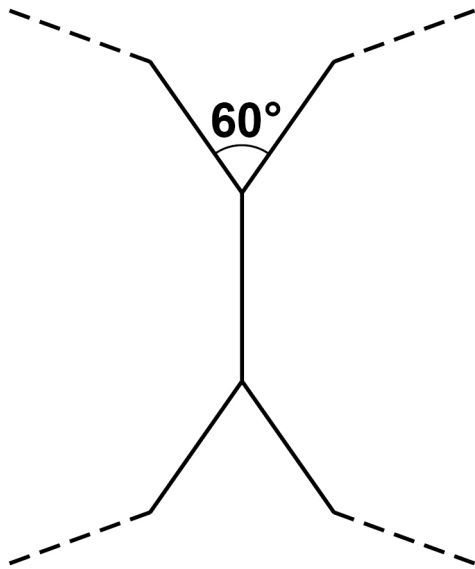
Answer

[Turn over]



- 14 Two congruent regular polygons are joined together.

They are not drawn accurately.



Work out the number of sides on each polygon.
[3 marks]

Answer _____

6

[Turn over]



15 Meal Deal

Choose one sandwich, one drink and one snack

There are

7 different sandwiches

5 different drinks

and

3 different snacks.

15 (a) How many different Meal Deal combinations are there? [2 marks]

Answer _____



15 (b) Two of the sandwiches have cheese in them.

Three of the drinks are fizzy.

Eva picks a Meal Deal at random.

Work out the probability that the sandwich has cheese in it AND the drink is fizzy.

Give your answer as a fraction. [2 marks]

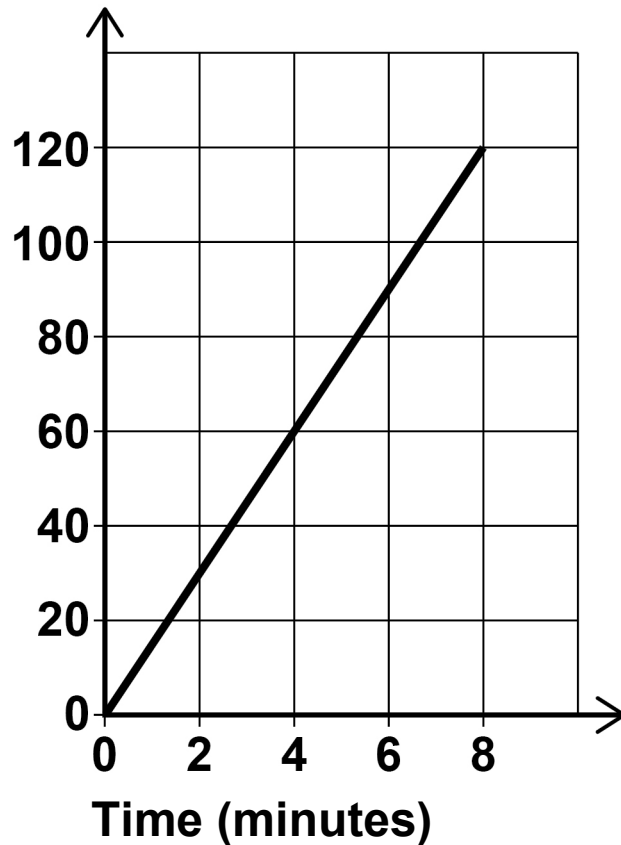
Answer _____

[Turn over]



- 16 Water is poured into a tank.
The graph shows the number of litres of water in the tank.

Number of Litres



How much water is poured into the tank each minute?

Circle your answer. [1 mark]

1.5 litres 15 litres 30 litres 120 litres



17 A and B are SIMILAR solids.

Solid	length (cm)
A	l
B	$2l$

Alex says,

“The volume of B is double the volume of A because the length of B is double the length of A.”

Is he correct?

Tick a box.

Yes

☐

No

☐

Give a reason for your answer. [1 mark]

[Turn over]



- 18 Circle the TWO roots of $(2x + 3)(5x - 2) = 0$
[1 mark]

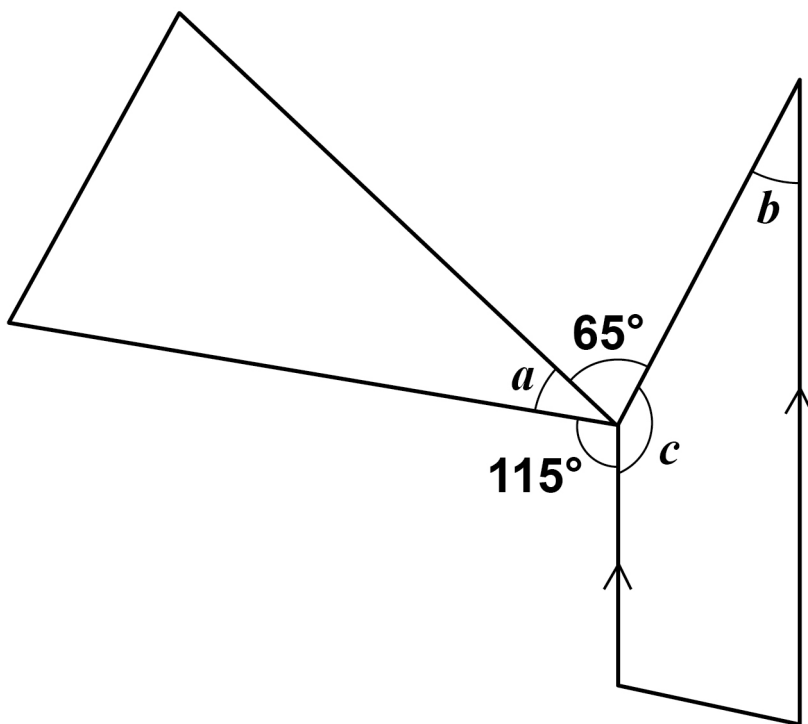
$$-\frac{3}{2}$$

$$-\frac{2}{5}$$

$$\frac{2}{5}$$

$$\frac{3}{2}$$

- 19 The diagram shows a triangle and a trapezium.
It is not drawn accurately.



Prove that $a = b$ [3 marks]

5

[Turn over]



- 20 In one month, the number of hours of exercise taken by 10 people are

4 7 2 8 6 5 1 82 3 9

Which is the appropriate average to use in this situation?

Tick a box.

☐

Mean

☐

Median

☐

Mode



**Give one reason for each of the other two averages as to why they are NOT appropriate.
[2 marks]**

Reason 1 _____

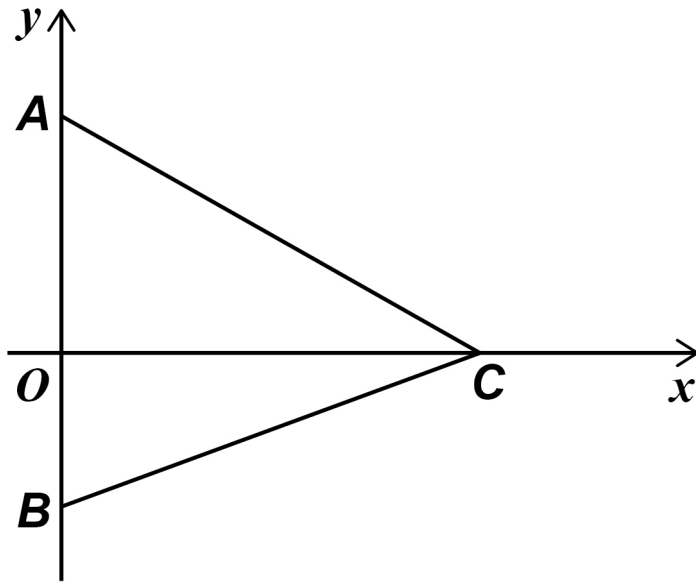
Reason 2 _____

[Turn over]



21 A , B and C are points on the axes as shown.

The diagram is not drawn accurately.



The area of triangle ABC is 28 square units.

Work out possible coordinates for A , B and C .
[2 marks]

A (_____ , _____)

B (_____ , _____)

C (_____ , _____)

[Turn over]



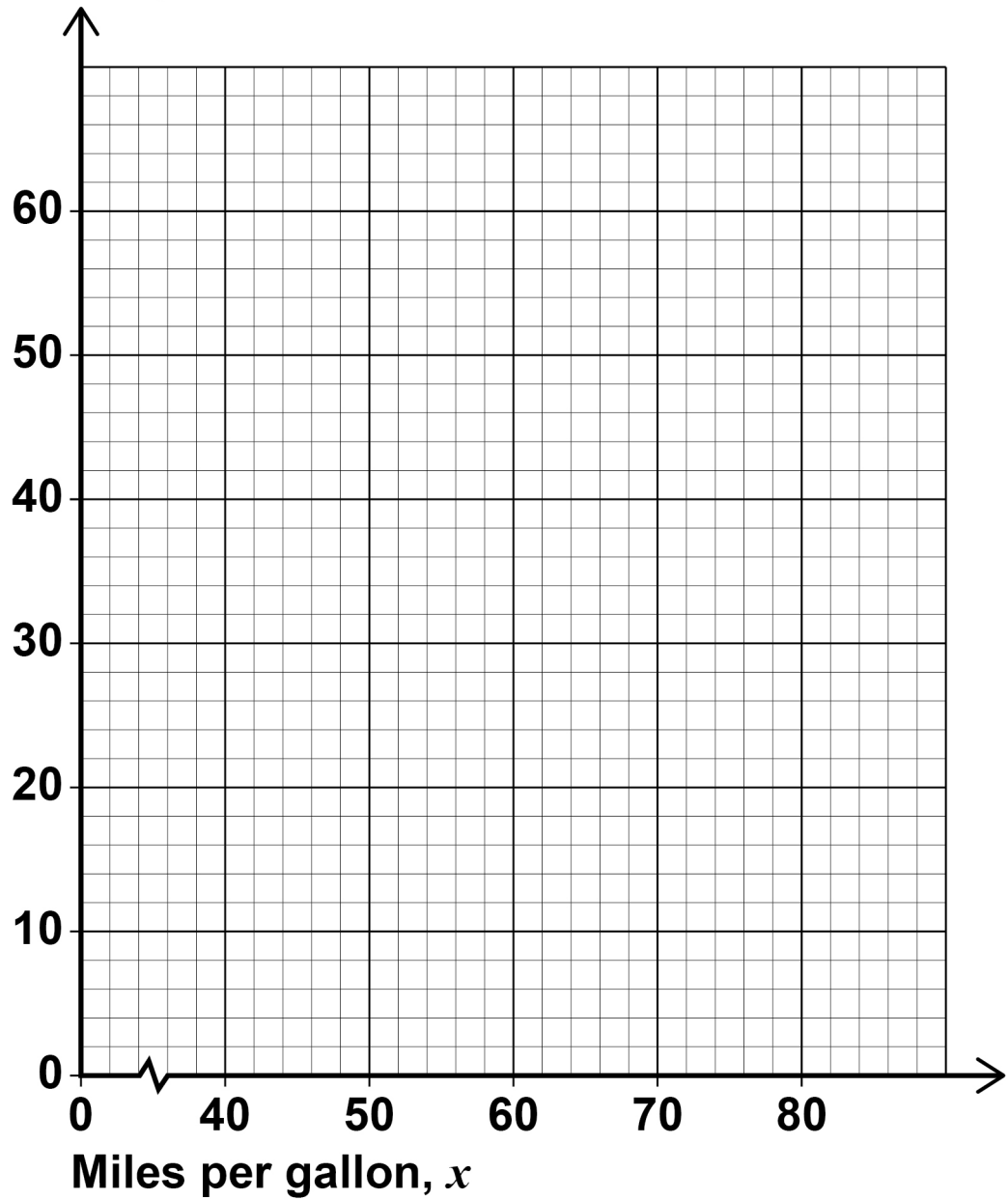
- 22 Here is some information about the miles per gallon of 60 cars.

Miles per gallon, x	Frequency
$40 < x \leq 50$	6
$50 < x \leq 60$	16
$60 < x \leq 70$	28
$70 < x \leq 80$	10



22 (a) Draw a cumulative frequency graph. [3 marks]

Cumulative
frequency



[Turn over]



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- 22 (b) Use the graph, on page 31, to work out the interquartile range. [2 marks]

Answer _____ miles per gallon

- 23 The equation of a curve is $y = (x + 3)^2 + 5$

Circle the coordinates of the turning point.
[1 mark]

(5, 3)

(5, -3)

(3, 5)

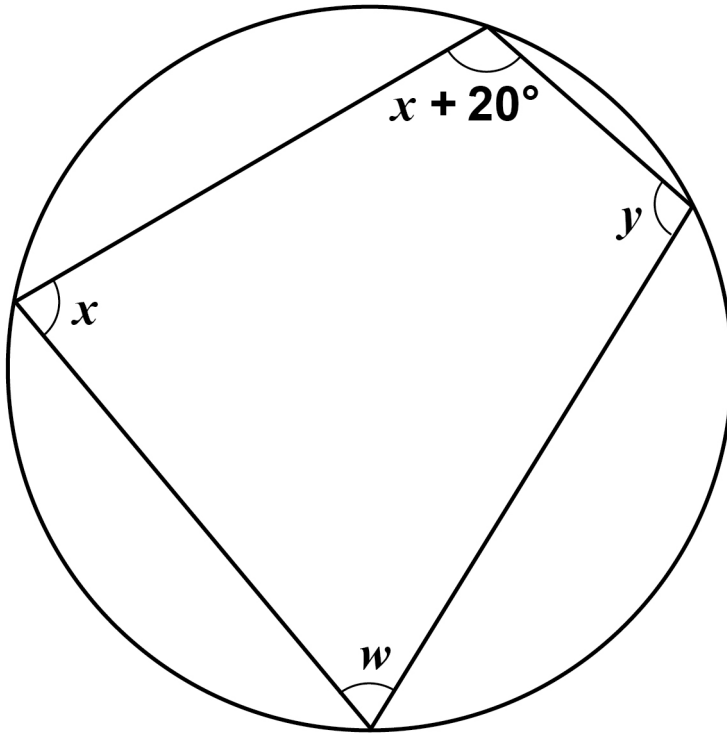
(-3, 5)

[Turn over]



24 Here is a cyclic quadrilateral.

It is not drawn accurately.



$$x : y = 5 : 7$$

Work out the size of angle w . [4 marks]



Answer _____ degrees

[Turn over]



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25 15 machines work at the same rate.

Together, the 15 machines can complete an order in 8 hours.

3 of the machines break down after working for 6 hours.

The other machines carry on working until the order is complete.

In total, how many hours does EACH of the other machines work? [3 marks]

Answer _____ **hours**

7

[Turn over]



26 (a) $0.\dot{7} = \frac{7}{9}$

Use this fact to show that $0.0\dot{7} = \frac{7}{90}$ [1 mark]



26 (b) Using part (a) or otherwise, convert $0.\dot{2}\dot{7}$ to a fraction.

Give your answer in its simplest form. [3 marks]

Answer _____

[Turn over]



27 **There are 11 pens in a box.**

8 are black and 3 are red.

Two pens are taken out at random WITHOUT replacement.

Work out the probability that the two pens are the SAME colour. [4 marks]



Answer

8

[Turn over]

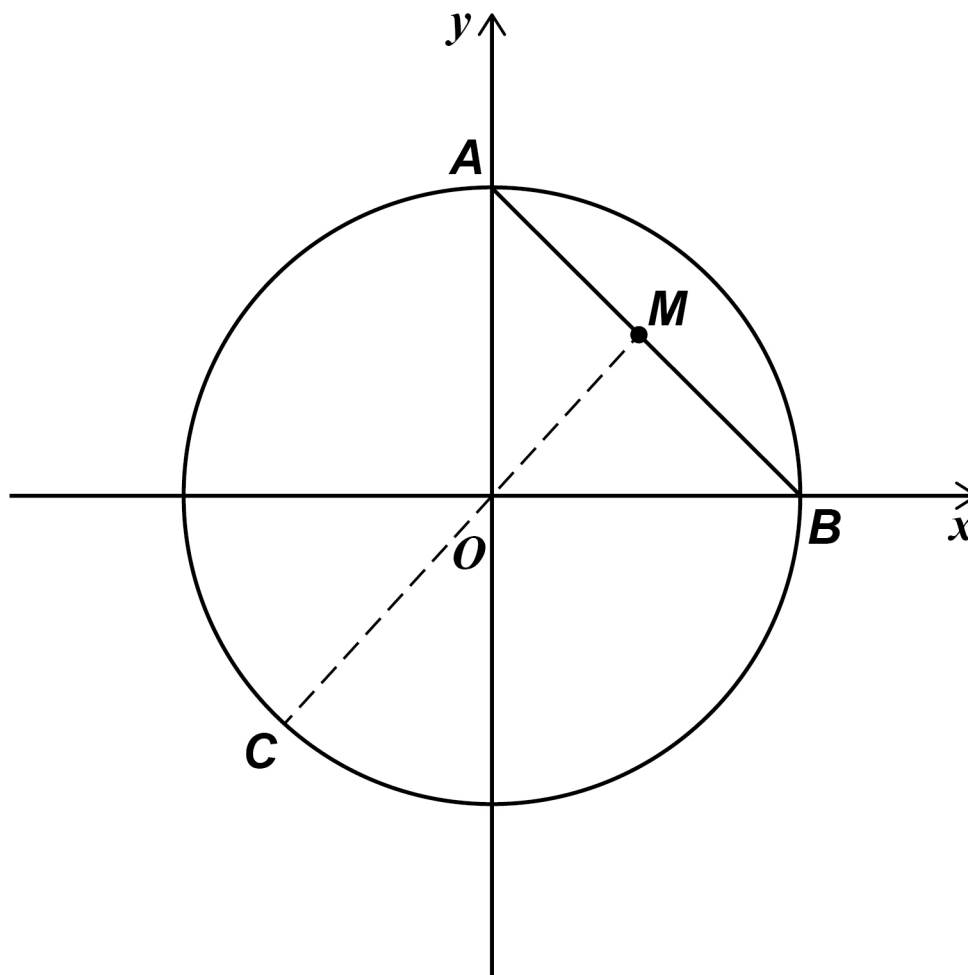
- 28 ***A, B and C are points on the circle $x^2 + y^2 = 36$ as shown.***

A is on the y -axis.

B is on the x -axis.

M is the midpoint of AB .

COM is a straight line.



**28 (a) Show that the coordinates of A are $(0, 6)$
[1 mark]**

28 (b) Work out the coordinates of B . [1 mark]

Answer (_____ , _____)

[Turn over]



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- 28 (c) Show that the equation of the straight line passing through C , O and M is $y = x$ [2 marks]

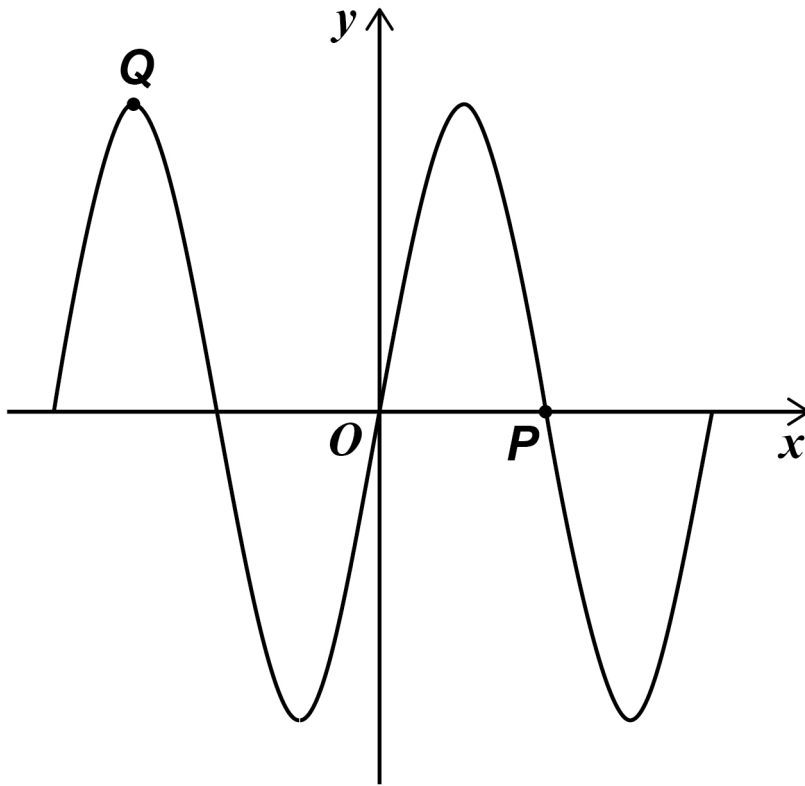
- 28 (d) Work out the coordinates of C .
Give your answers in surd form. [3 marks]

Answer (_____ , _____)

[Turn over]



29 Here is a sketch of $y = \sin x^\circ$ for $-360 \leq x \leq 360$



29 (a) Write down the coordinates of P . [1 mark]

Answer (_____ , _____)

29 (b) Write down the coordinates of Q . [1 mark]

Answer (_____ , _____)

[Turn over]



30 (a) Work out the value of $81^{-\frac{1}{4}}$ [2 marks]

Answer



- 30 (b) Write 16×8^{2x} as a power of 2 in terms of x .
[3 marks]

Answer

7

END OF QUESTIONS



There are no questions printed on this page

For Examiner's Use	
Pages	Mark
4-6	
7-10	
10-13	
14-16	
17-19	
20-22	
23-25	
26-29	
30-33	
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38-41	
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TOTAL	

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