AQA Mock Test Papers

Paper3 - Test2

Please write clearly in block capitals.

Centre number | | | | | | Candidate number | | | | |

Surname _____

Forename(s) _____

Candidate signature _____

I declare this is my own work.

GCSE Mathematics

Higher tier - Paper 3 - Calculator

H

Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:

- a calculator
- mathematical instruments
- the Formulae Sheet (enclosed).

Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer all questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- Do allrough 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 betagged securely to this answer book.

Advice

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

For Examiner's Use	
Pages	Mark
2–3	
4–5	
6–7	
8–9	
10–11	
12–13	
14–15	
16–17	
18–19	
20–21	
22–23	
24–25	
26	
TOTAL	

Do not write outside the box

Answer all questions in the spaces provided.

1 b is 5 more than the square root of a

Circle the correct equation.

[1 mark]

$b = \sqrt{a} + 5$ $b = \sqrt{a} - 5$ $b = \sqrt{a + 5}$ $b = \sqrt{a - 5}$

2 Circle the largest number

[1 mark]

$4.58\dot{}$ 4.58 4.588 $4.508\dot{}$

3 A shape is translated by the vector $\begin{pmatrix} 0 \\ 6 \end{pmatrix}$

In which direction does the shape move?

Circle your answer.

[1 mark]

left right up down

Do not write outside the box

4 Factorise $x^2 - 81$

Circle your answer.

[1 mark]

$(x+9)2$ $(x-9)2$ $(x+9)(x-9)$ $x(x-81)$

5 The nth term of a sequence is given by $10n+7$.

Work out the numbers in the sequence that:

have two digits and

are not prime

[3 marks]

Answer .....

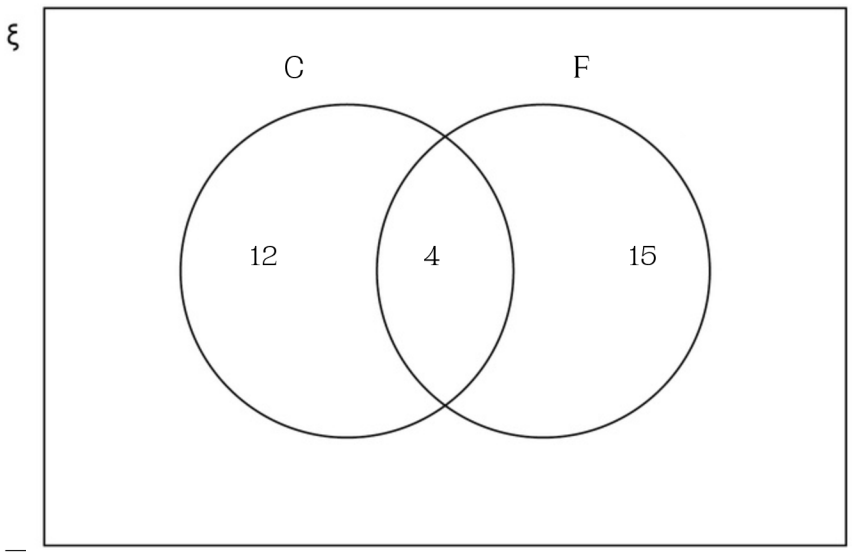
7

6 In the Venn diagram

ξ represents 30 students in a class

C is students who play cricket,

D is students who play football.



[3 marks]

6 (a) One student from the class is picked at random.
Work out the probability that the student plays football

Answer .....

Do not write outside the box

6 (b) One of the students who plays cricket is picked at random
Work out the probability that this student also plays football

[1 mark]

Answer _____

7 A straight line has a gradient of -3 and passes through the point (2,7).
Work out the equation of the line in the form y = mx + c.

[3 marks]

Answer £ _____

7

Do not write outside the box

8 Show that, for $x \neq 0$

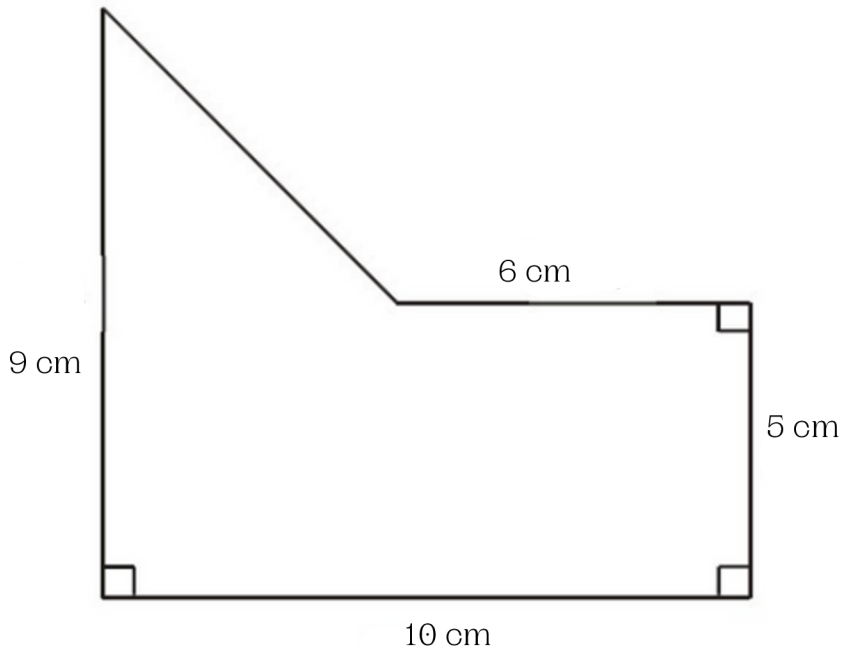
$$\frac{x+5}{6x} - \frac{4}{3x}$$

can be written in the form $\frac{ax+b}{cx}$ where a, b and c are integers [3 marks]

Answer .....

Do not write outside the box

9



Not drawn accurately

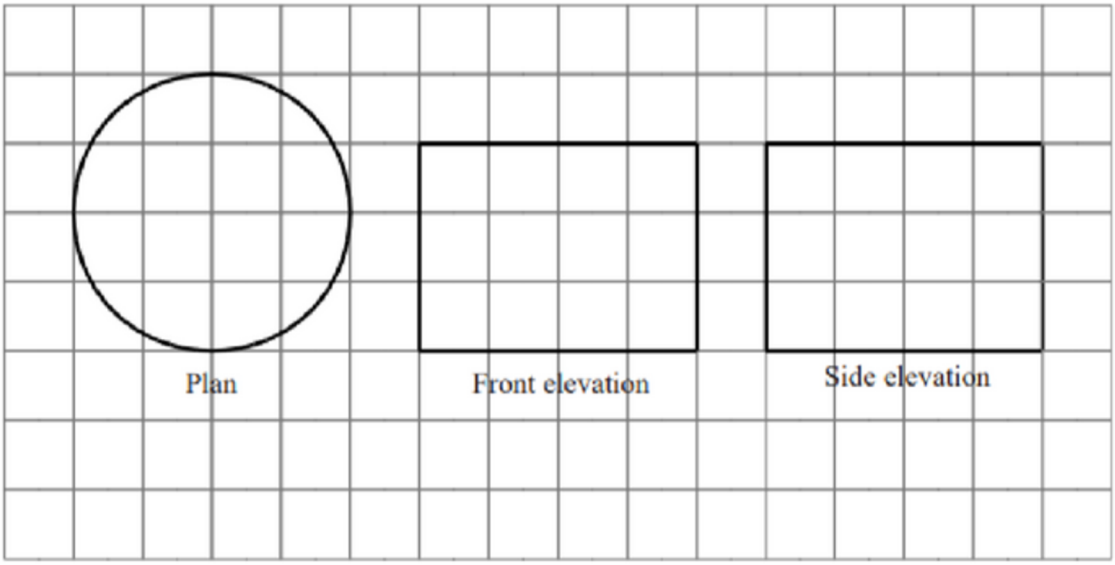
Workout the area of shape.

[4 marks]

Answer _____

7

10 The diagram shows the plan, front elevation and side elevation of a solid shape, drawn on a centimetre grid.



In the space below, draw a sketch of the solid shape.
Give the dimensions of the solid on your sketch.

[2 marks]

Do not write outside the box

11 $a : b = 5 : 3$ and $6b = 11c$

Work out $a : c$ in its simplest form

[3 marks]

Answer _____

5

Do not write outside the box

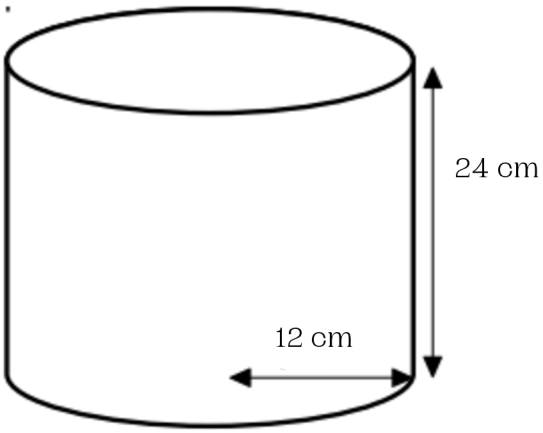
12 Factorise $4x^2 + 19x + 12$.

[2 marks]

Answer _____

Do not write outside the box

13 A solid cylinder has a radius of 12 cm and a height of 24 cm.



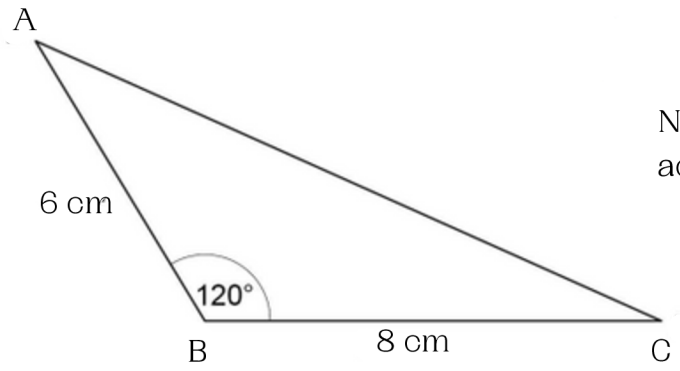
Work out the volume of the cylinder.
Give your answer correct to 3 significant figures. [4 marks]

Answer _____

6

Do not write outside the box

14 Here is a triangle



Not drawn accurately

Work out the length AC.

[3 marks]

Answer ..... cm

Do not write outside the box

15 There are 500 boys and 600 girls in a school.
The probability that a boy chosen at random studies Spanish is $\frac{4}{5}$
The probability that a girl chosen at random studies Spanish is $\frac{2}{3}$

(a) Work out the number of students in the school who study Spanish.

[3 marks]

Answer _____

Turn over for the next question

6

Do not write outside the box

16 The mean mass of a group of 14 athletes is 70 kg.

A new athlete joins the group with a mass of 85 kg.

Work out the new mean mass of the group.

[3 marks]

Answer .....

Do not write outside the box

17 Circle the highest common factor (HCF) of $8x^2y^3$ and $12x^3y$.

[1 mark]

$2x^2y^3$ $4x^2y$ $4x^3y^3$ $6x\,y^2$

18 $g(x)=2x^2-x^3$, Circle the value of g(-2).

[1 mark]

-12 0 8 16

19 The equation of a straight line is $4x - y = 12$
Circle the point where the line crosses the x-axis

(0,12) (3,0) (12,0) (0,-12)

[1 mark]

Turn over for the next question

6

20 $g(x) = 10 - 2x$ $h(x) = x^2$

Solve $gh(x) = 30$

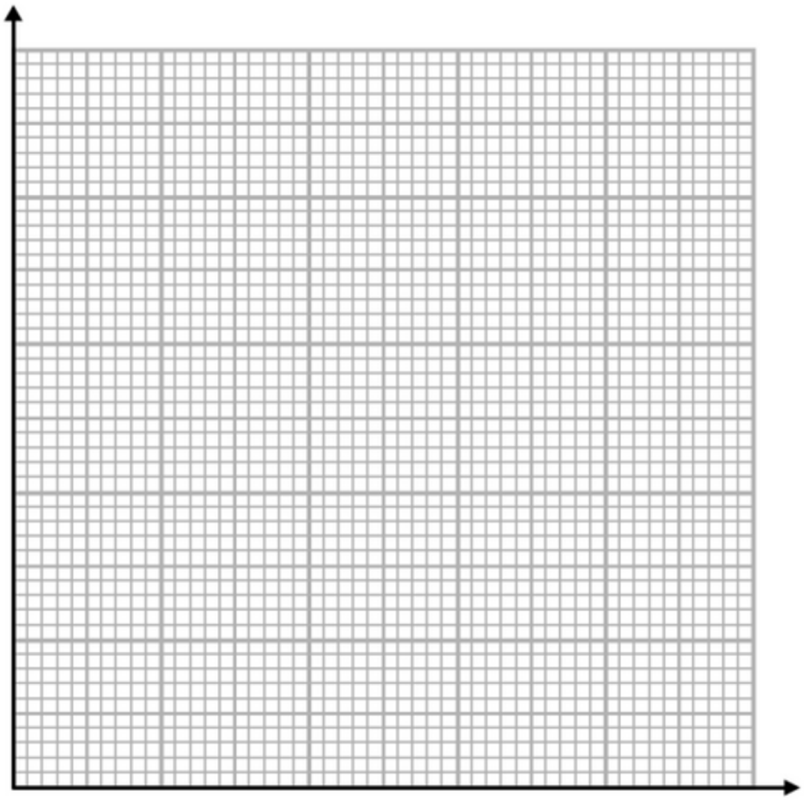
[3 marks]

Answer _____

21 The table shows information about the speed, in mph, of some cars.

Speed (mph)	Frequency
$40 < s \leqslant 55$	6
$55 < s \leqslant 60$	10
$60 < s \leqslant 65$	46
$65 < s \leqslant 75$	48
$75 < s \leqslant 90$	6

(a) On the grid, draw a histogram for the information in the table. [3 marks]



(b) Work out an estimate for the number of cars over 70mph [1 mark]

Answer .....

7

Do not write outside the box

22 The value of a new laptop is £2,000.

The value of the laptop decreases by

20% in the first year
15% in each of the next 3 years.

Work out the value of the laptop after 4 years.

[3 marks]

Answer _____

Do not write outside the box

23 (a) Work out 150 as a percentage of 50.

[1 mark]

100 200 300 500

23 (b) The equation of a circle is $x^2 + y^2 = 16$
Work out the length of the diameter.

[1 mark]

Answer _____

24 $4^x = 64$
Find the value of x

[1 mark]

x = _____

6

Do not write outside the box

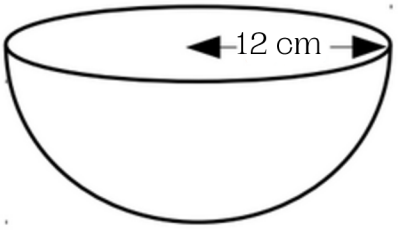
25 Expand and simplify fully $(x - 2)(x + 8)(x + 4)$

[3 marks]

Answer _____

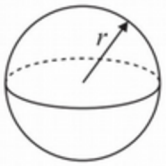
Do not write outside the box

26 The diagram shows a solid hemisphere with a radius of 12 cm



Volume of sphere $= \frac{4}{3}\pi r^3$

Surface area of sphere $= 4\pi r^2$



Work out the total surface area of the hemisphere.

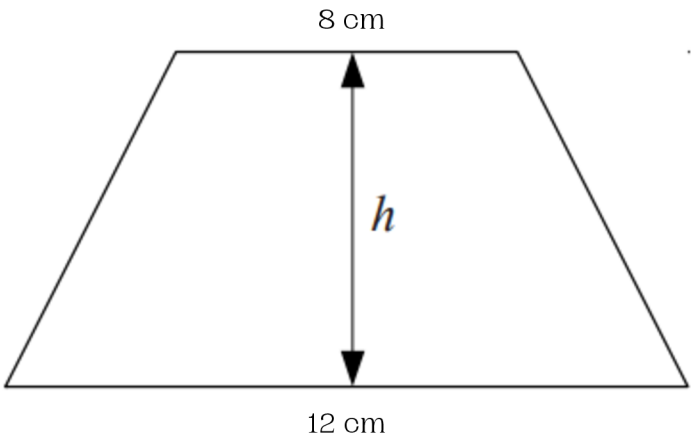
Give your answer in terms of π.

[3 marks]

Answer _____ : _____

6

27 (a) The diagram shows a trapezium with an area of 72 cm^2 and a perpendicular height h cm.
The lengths of the parallel sides are 8 cm and 12 cm.



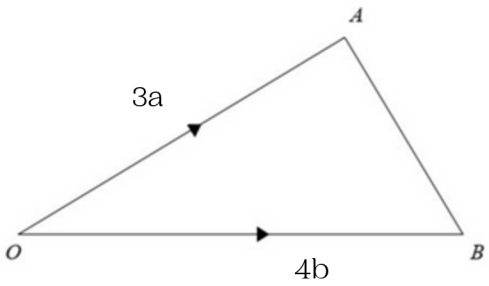
Find the value of h.

[2 marks]

Do not write outside the box

27 (b)

3a



4b

[4 marks]

In the diagram:

- $\overrightarrow{OA} = \mathbf{3a}$,
- $\overrightarrow{OB} = \mathbf{4b}$,
- P is a point on AB such that $AP : PB = 2 : 1$.

It is given that $\overrightarrow{OP} = k(\mathbf{4a} + \mathbf{9b})$.

Find the value of k.

Turn over for the next question

6

Do not write outside the box

28 The length of a garden hose is 20 metres, correct to the nearest half-metre.

A section of hose measuring 3.6 metres, correct to the nearest 0.1 metres, is cut off.

Work out the maximum possible length of the hose left.

[3 marks]

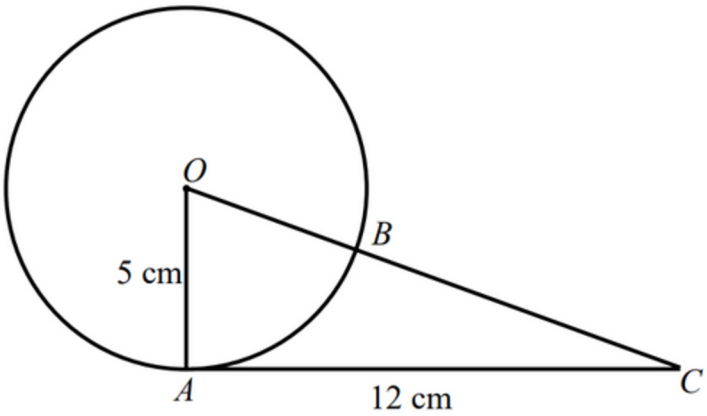
Answer _____

Do not write outside the box

29 A and B are points on the circumference of a circle, centre O.
AC is a tangent to the circle.
OBC is a straight line.

OA = 5 cm AC = 12 cm

Not drawn accurately



Find the length of BC.

[4 marks]

You must show all your working.

7

Do not write outside the box

30 (a) p is directly proportional to the square of q.
p = 50 when q = 5.

Work out an equation connecting p and q.

[3 marks]

Answer .....

30 (b) A circle has centre (0, 0) and passes through (0, 10) [1 mark]
Write down the equation of the circle

Answer .....

END OF QUESTIONS

4