



THIRD SPACE
LEARNING

Mathematics

Paper 6

(Calculator)

Higher Tier

OCR GCSE

SET 5

Mathematics Paper 6 (Calculator) Higher Tier OCR GCSE

SET 5

Name

Total marks



Paper length: 1hr 30mins

Instructions

- Use black ink or ball-point pen.
- Fill in the boxes at the top of this page with your name, centre number and candidate number.
- Answer all questions.
- Answer the questions in the spaces provided – there may be more space than you need.
- You must show all your working.
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- Calculators may be used.

Question	Mark
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Information

- The total mark for this paper is 100
- The marks for each question are shown in brackets – use this as a guide as to how much time to spend on each question.

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser. Tracing paper may be used.

This practice paper is based on the topics from the **advanced information for the November 2026 exam series.**

Please note, this practice paper is an example to help revision, these topics can be tested in other ways and other topics may be included in the actual papers

1 (a) Simplify $q^7 \times q^5$

(a) [1]

(b) Simplify $\frac{8p^9}{4p^2}$

(b) [2]

(c) Write down the value of a and b if $(2m^a)^3 = bm^{12}$

$a =$

$b =$

[2]

2 (a) Ben is a hockey goalkeeper.

The probability that Ben saves a goal is 0.7.

What is the probability that Ben does not save a goal?

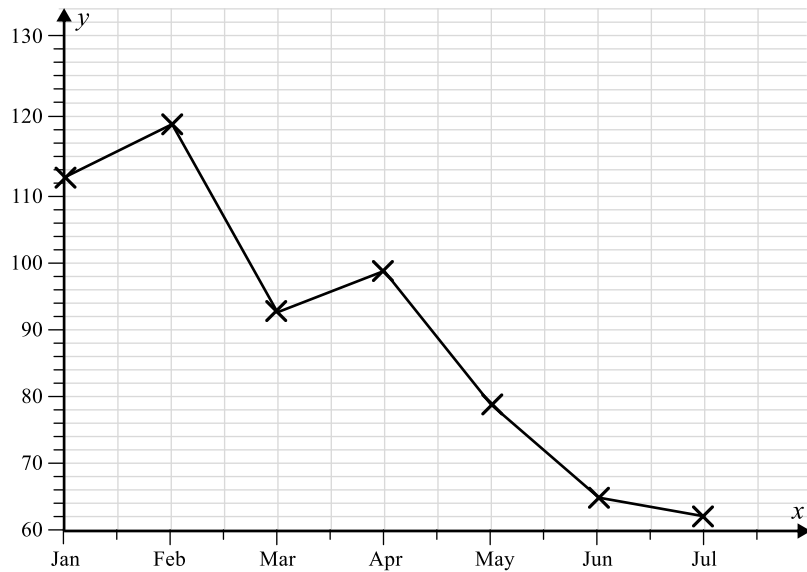
(a) [1]

(b) In one hockey season, there are 200 shots at the goal.

Work out an estimate for the number of goals Ben will save.

(b) [1]

3 (a) This graph shows the rainfall in Cardiff in 2025

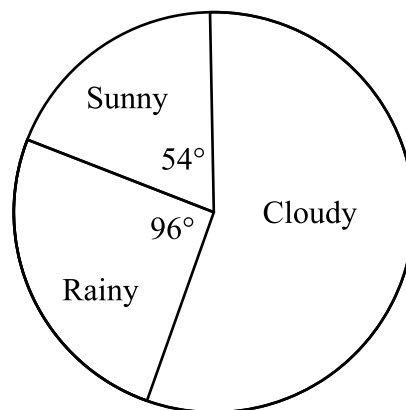


Explain why the graph is misleading.

[1]

(b) Each day for a number of days, the weather is recorded as either sunny, rainy or cloudy.

The results are shown in the pie chart.



Given that the weather was recorded as cloudy for 70 days,

work out the number of days for which the weather was recorded as sunny.

----- days [4]

4 Bobby has £350000. He wants to purchase a house.

When Bobby purchases a house, he will need to pay legal fees of £2000 as well as stamp duty tax at the following rates:

The first £120000 of the property price	No stamp duty
The second £125000 (£125000 – £250000)	2%
Anything above £250000	5%

Bobby decides he wants to buy a house for £330000.

Can Bobby afford to buy the house and pay the fees and stamp duty?

Show how you decide.

----- [4]

5 (a) Write 0.000034 in standard form.

(a) [1]

(b) Write 2.71×10^4 as an ordinary number.

(b) [1]

(c) Write the fraction $\frac{3 \times 10^8}{4.5 \times 10^9}$ in its simplest form.

(c) [1]

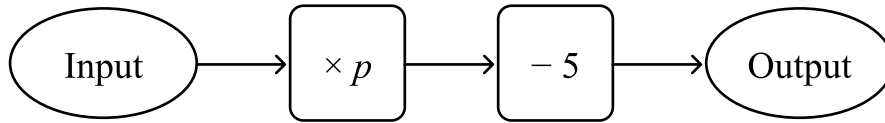
(d) An atom of cesium has a diameter of 5.2×10^{-10}
 An atom of helium has a diameter of 6.2×10^{-11}

How many times larger is cesium than helium?

Give your answer to 3 significant figures.

(d) [2]

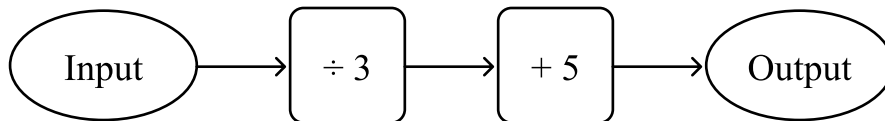
6 (a) Here is a function.



When the input is 8, the output is 5.
Find the value of p .

(a) [3]

(b) Here is another function.



When the input is x , the output is y .
Write an algebraic expression for x in terms of y .

(b) [2]

- 7 The mass of a piece of wood is 3.7kg.
The density of the wood is 0.8g/cm^3 .

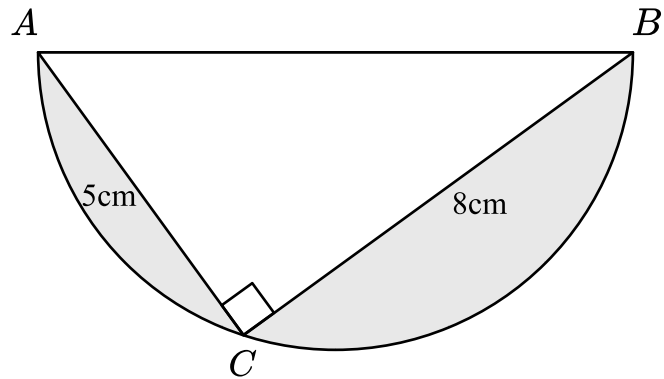
(a) Work out the volume of the wood.

(a) cm^3 [3]

(b) Write 0.8g/cm^3 in kg/m^3 .

(b) kg/m^3 [1]

8 Here is a right angled triangle inside a semi-circle.



(a) Work out the length AB .

Give your answer to 2 decimal places.

(a) cm [2]

(b) Work out the shaded area.

Give your answer to 2 decimal places.

(b) cm^2 [4]

- 9 The mean of three numbers is 120
The three numbers are $3a$, $5a + 2$ and $2a + 8$
Work out the value of the smallest number.

..... [4]

- 10 (a) Here are five numbers.

$$47^{11} \quad 47^{34} \quad 47^{55} \quad 47^{60} \quad 47^{93}$$

Find the lowest common multiple of the numbers.

(a) [1]

(b) $P = 2^5 \times 3^2 \times 7^4$

$$Q = 2^x \times 3^4 \times 7^2$$

Given that the highest common factor of P and Q is $2^3 \times 3^2 \times 7^2$, write down the value of x .

(b) [1]

11 (a) a and b are integers such that

$$2 \leq a < 8$$

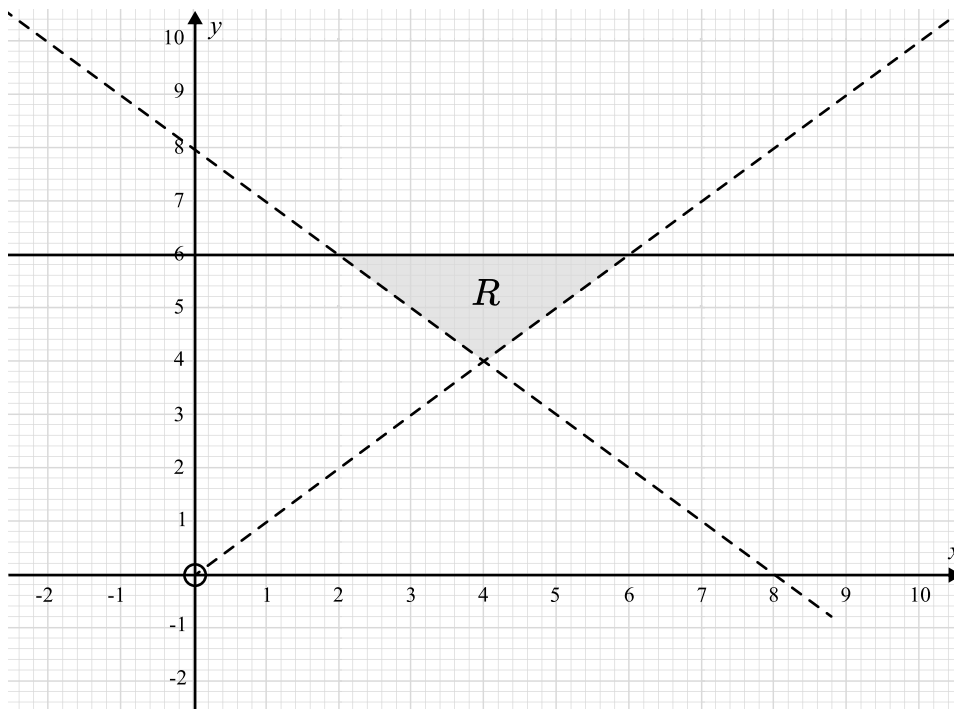
$$5 < b \leq 10$$

$$a + b = 11$$

Write down all the possible values of b .

(a) [2]

(b) The region R satisfies 3 inequalities.



Write down the three inequalities.

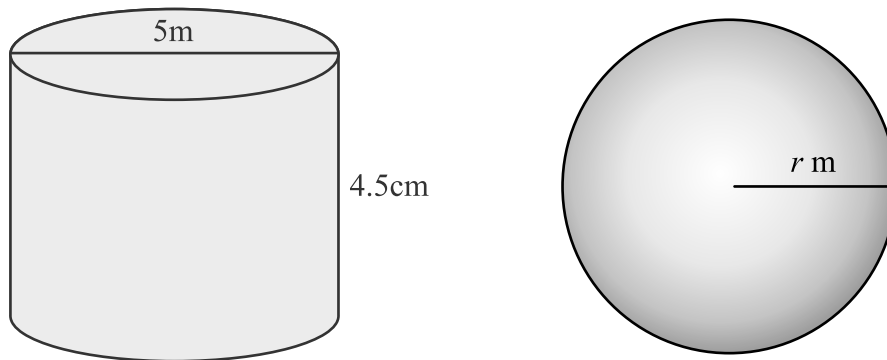
.....

.....

.....

[6]

12 Here is a cylinder and a sphere.



The sphere has radius r metres.

Dante wants to paint both the cylinder and the sphere.

Dante has enough paint to cover 250m^2 .

Find the maximum value of r to ensure that Dante has enough paint to cover both objects.

Give your answer to 3 significant figures.

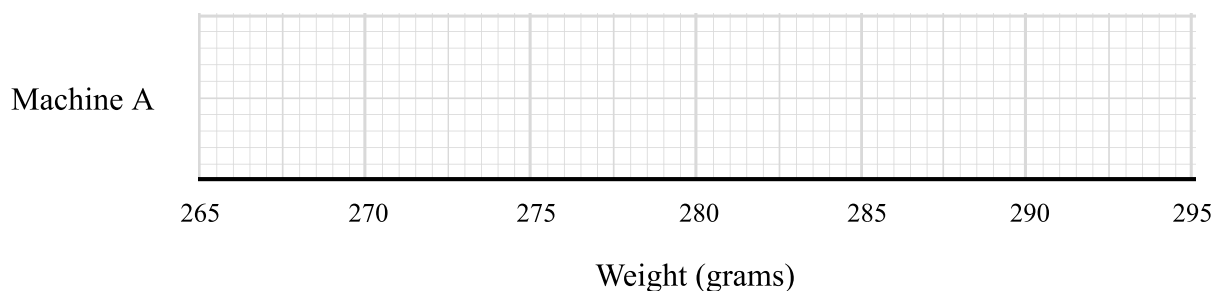
----- [4]

13 Jessie records the weights of the cakes produced by Machine A in a factory.

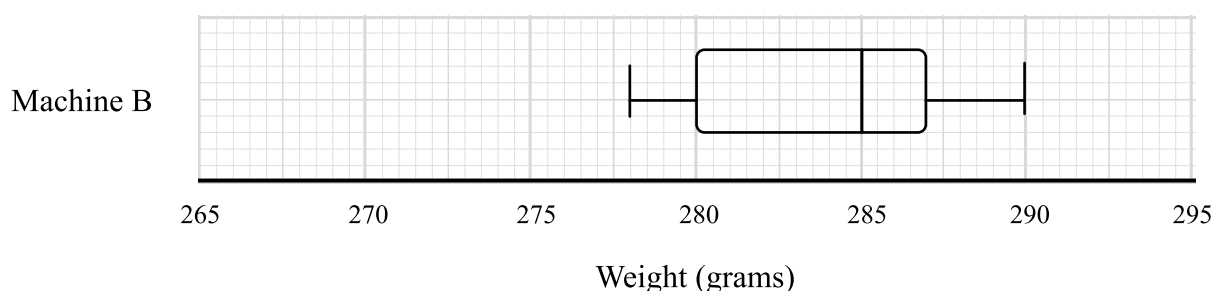
	Weight (grams)
Lowest value	270g
Lower quartile	275g
Median	281g
Interquartile range	10g
Highest value	290g

(a) Draw a box plot to show this information.

[3]



The results of the weights of the cakes produced by machine B in the same factory are shown in the following box plot.



(b) Compare the distribution of the weights of the cakes produced by Machine A and Machine B.

[2]

14 A restaurant has 5 starters, 8 main courses and 4 desserts.

Tristan is going to choose either:

- A starter and a main course OR
- A main course and a dessert OR
- A starter, a main course and a dessert

Show that there are 232 different options that Tristan could select.

..... [2]

15 Here are the first five terms of a quadratic sequence

7 11 17 25 35

Find an expression in terms of n , for the n th term of the sequence.

..... [3]

16 Alison rolls 2 dice and adds the values.

Find the probability that the sum of the two values is greater than 7

----- [3]

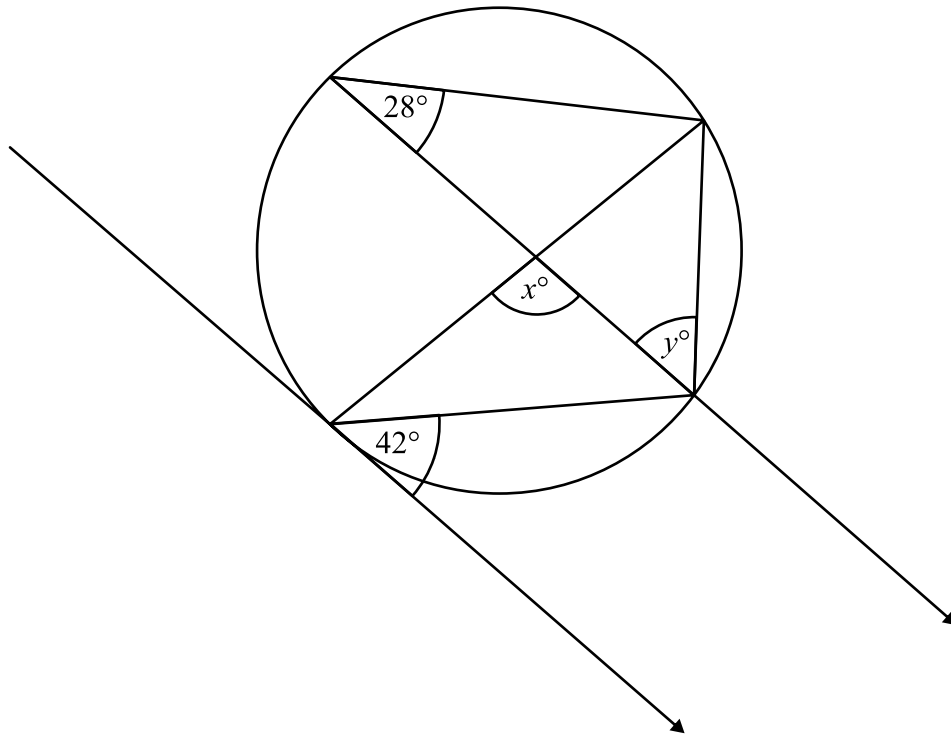
17 (a) Factorise $p^2 - q^2$

(a) ----- [1]

(b) Show how you could use your answer to part a to calculate $51^2 - 49^2$

[2]

18



(a) Work out the size of angle x .

..... $^\circ$ [2]

(b) Work out the size of angle y .

..... $^\circ$ [2]

- 19** At the end of 2024 there were 4200 fish in a lake.
By the end of 2025, the number of fish remaining was 4032

It is assumed that the number of fish in the lake is given by

$$F = ar^n$$

where F is the number of fish in the lake and n is the number of years after the end of 2024.

- (a)** Write down the value of a .

$$a = \text{-----} \quad \mathbf{[1]}$$

- (b)** Show that $r = 0.96$

[2]

- (c)** Show that by the end of 2034, the number of fish in the lake is expected to have decreased by over 30%.

[3]

20 M and N are two geometrically similar solids

The surface area of shape N is 448cm^2

The surface area of shape M is 1008cm^2

The volume of shape M is 1134cm^3

Work out the volume of shape N.

----- cm^3 [3]

21 Express $\frac{x}{x+3} + \frac{2x}{3x-1} - 5$ as a single fraction in its simplest form.

----- [3]

22 $W = \frac{u - v}{t}$

$u = 14.1$ to 3 significant figures.

$v = 2.35$ to 2 decimal places.

$t = 0.47$ to 2 decimal places.

Work out the lower bound for W .

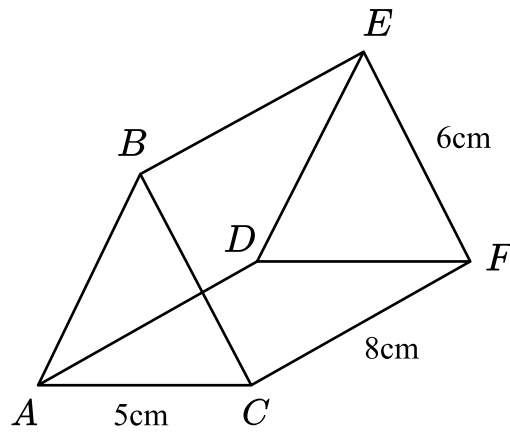
Give your answer to 2 decimal places.

----- [3]

23 $ABCDEF$ is an isosceles triangular prism.

$$AB = BC$$

$$AC = 5\text{cm}, CF = 8\text{cm and } EF = 6\text{cm}$$



Calculate the size of the angle between the line AE and the plane $ACFD$.

Give your answer to 1 decimal place.

..... ° [4]

24 Here is a quadratic equation.

$$ax^2 + 6x + c = 0$$

The solutions to this equation are given by $x = \frac{-6 \pm 2\sqrt{42}}{6}$

Find the value of a and the value of c .

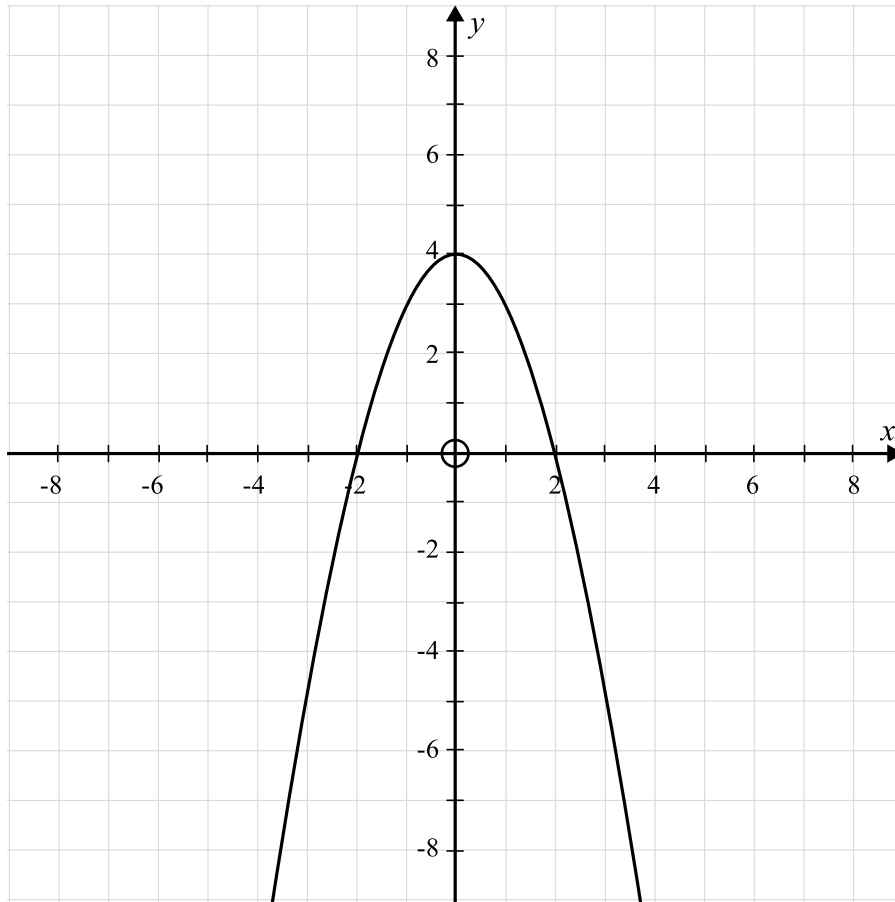
Show your working clearly.

$a =$

$c =$

[3]

25 This is the graph of $y = f(x)$



(a) On the grid above, draw the graph of $y = f(x - 2)$

[2]

(b) A translation of $\begin{pmatrix} -3 \\ 1 \end{pmatrix}$ is applied to $y = f(x)$.

Write down the equation of the new graph.

(b) [2]


End of Questions

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