



Please write clearly in block capitals.

Centre number

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Candidate number

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Surname _____

Forename(s) _____

Candidate signature _____

I declare this is my own work.

GCSE MATHEMATICS

Foundation Tier Paper 2 Calculator

F

Friday 10 November 2023

Morning

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 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.

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	
TOTAL	



N 0 V 2 3 8 3 0 0 2 F 0 1

IB/M/Nov23/E12

8300/2F

Do not write
outside the
box

2

Answer **all** questions in the spaces provided.

1

Convert 800 centimetres to metres.

[1 mark]



800

8

Answer _____ m

2

The temperature was -11°C and **increases** by 5°C

Work out the new temperature.

[1 mark]

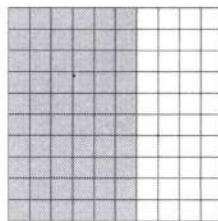
-6

Answer _____ $^{\circ}\text{C}$ 

0 2

IB/M/Nov23/8300/2F

- 3 (a) Here is a grid.



What percentage of the grid is shaded?

$$\frac{60}{100}$$

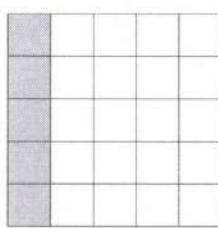
[1 mark]

Answer 60 %

60

%

- 3 (b) Here is a different grid.



What percentage of the grid is shaded?

$$\frac{5}{25} / \frac{1}{5}$$

[1 mark]

Answer 20 %

20

%

4

Turn over ▶



0 3

IB/M/Nov23/8300/2F

- 4 (a) Solve $\frac{x}{3} = 6$

$$6 \times 3$$

[1 mark]

$x = \underline{\hspace{2cm}}$

18

- 4 (b) Solve $2x + 3 = 27$

$$2x = 24$$

[2 marks]

$$24 \div 2$$

$x = \underline{\hspace{2cm}}$

12

- 5 Work out $\frac{9}{4}$ as a decimal.

$$4 \overline{)9.00} \quad 2.25$$

[1 mark]

Answer 2.25

2.25



0 4

IB/M/Nov23/8300/2F

- 6 Complete the bank statement.

[3 marks]

Date	Description	Credit (£)	Debit (£)	Balance (£)
01/11/2021	Starting balance			736.28
05/11/2021	Rent		450.00	286.28
14/11/2021	Refund	25.00		311.28
27/11/2021	Wages	1830.29		2141.57

- 7 Put all the numbers 4, 5, 6, 10 and 20 into the grid so that the numbers in each row and each column multiply to 120

[3 marks]

$120 \div 24 \rightarrow$
etc

4	3	10	120
5	2	12	120
6	20	1	120

120 120 120

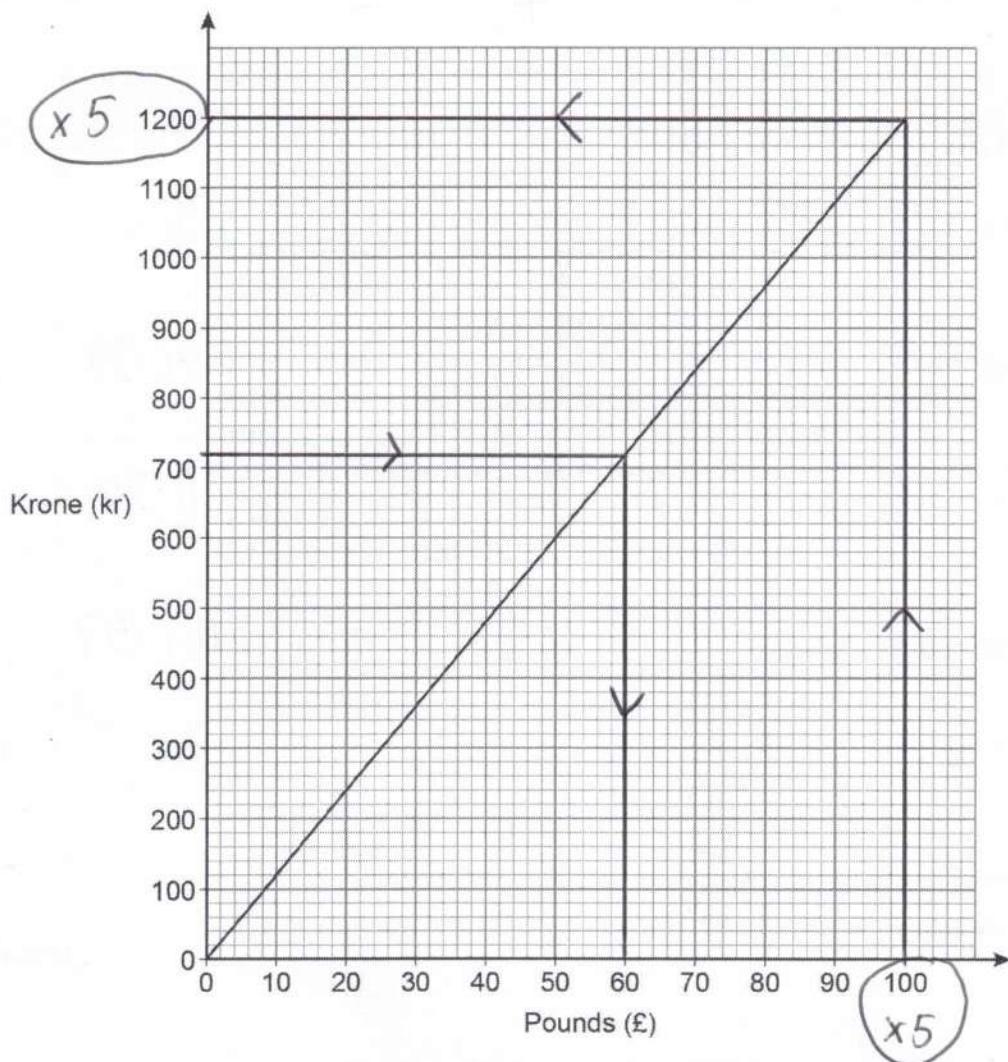
10

Turn over ►



0 5

- 8 The graph below is used to convert between pounds (£) and Norwegian krone (kr).



- 8 (a) Convert 720 krone into pounds.

[1 mark]

Answer £ 60

- 8 (b) Convert £500 into krone.

[2 marks]

1200 x 5

Answer 6000 kr



0 6

9 Connor is estimating the answer to $385 + 1479$

9 (a) He rounds each number to the nearest 10

Work out his estimate.

[2 marks]

$$390 + 1480$$

Answer

1870

9 (b) Connor says,

"My estimate will be more than the exact answer."

How does he know this **without working out the exact answer?**

[1 mark]

Both were rounded up

Turn over for the next question

6

Turn over ►



0 7

IB/M/Nov23/8300/2F

- 10 Here are the salaries, in £, of the 6 workers in a company.

18300 20700 21500 21500 21500 99000
+ + + + + +

- 10 (a) Work out the mean salary.

$$= 202500$$

[2 marks]

$\div 6$

Answer £ 33 750

- 10 (b) Why is the mean **not** the best average to represent the salaries?

[1 mark]

99000 is much higher than
the other 5



0 8

- 11 Zoe's mass is 55 kilograms.

Work out her mass in stones and pounds.

Use 1 kilogram = 2.2 pounds

14 pounds = 1 stone

[3 marks]

$$55 \times 2.2 = 121 \text{ lbs}$$

$$121 \div 14 = 8.6\dots$$

$$8 \times 14 = 112$$

$$121 - 112$$

Answer 8 stones 9 pounds

Turn over for the next question



- 12 (a) A sauce is made from cream and stock in the ratio

$$\text{cream : stock} = 1 : 6$$

How much **sauce** can be made using 80 millilitres of cream?

[2 marks]

C : S

$$\begin{array}{rcl} \cancel{80} & \cancel{1 : 6} & \cancel{80} \\ 80 : 480 & & 80 + 480 \end{array}$$

Answer 560 ml

- 12 (b) A different sauce is made from olive oil and tomato juice in the ratio

$$\text{olive oil : tomato juice} = 1 : 14$$

What fraction of this sauce is olive oil?

[1 mark]

$$\frac{1}{15}$$

Answer 1/15



1 0

- 13 Multiplying y by 6 gives the same result as adding 15 to y

$$6y$$

$$y + 15$$

- 13 (a) Write this as an equation.

[2 marks]

Answer $6y = y + 15$

- 13 (b) Show that the value of y is **not** 4

[1 mark]

$$5y = 15$$

$$y = 3$$

Turn over for the next question

6

Turn over ►



1 1

IB/M/Nov23/8300/2F

- 14 A golf club is organising a trip for 42 people.
The costs are shown in the table.

Minibus hire	£450 per minibus
Fuel	£26 per minibus
1 game of golf	£18.50 per person

$$\times 2 = 37$$

Each minibus can hold 15 people. = 3 needed

Each person will play 2 games of golf.

The cost of the trip will be shared equally by the 42 people.

Work out the cost per person.

[5 marks]

$$\begin{array}{r} 450 \times 3 = 1350 \\ 26 \times 3 = 78 \end{array} \left. \begin{array}{r} \\ \end{array} \right\} 1428$$

$$1428 \div 42 = 34$$

$$34 + 37$$

Answer £ 71



1 2

- 15 An ordinary fair dice is rolled ten times.
Here are the first nine results.

6 1 3 2 1 5 5 5 5

Write down the probability of getting a 5 on the tenth roll.

[1 mark]

$\frac{1}{6}$

Answer _____

- 16 $r : w = 1 : 4$

Write down the ratio $r^2 : w^2$

[1 mark]

$1 : 16$

Answer _____ : _____

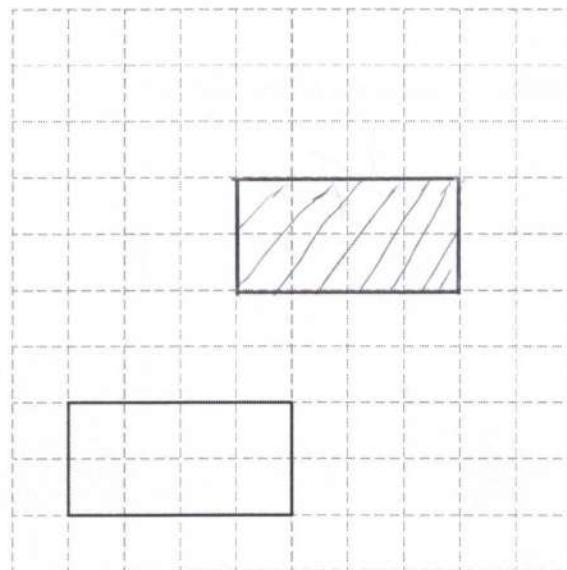
Turn over for the next question



- 17 (a) A rectangle is drawn on a square grid.

On the grid, draw a **congruent** rectangle.

[1 mark]

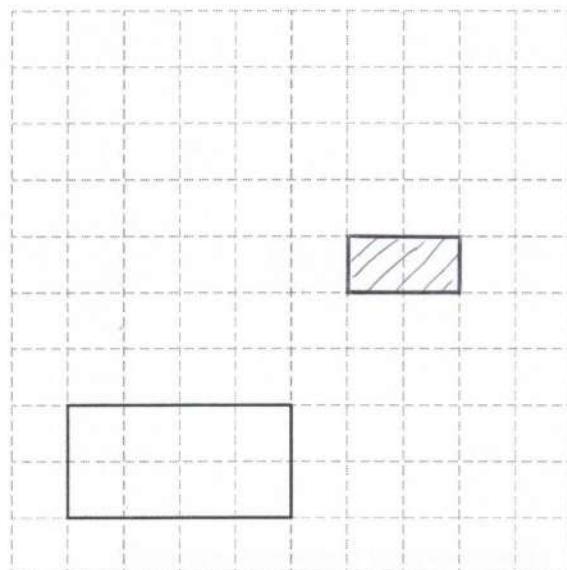


etc

- 17 (b) Here is the rectangle on a different square grid.

On this grid, draw a **similar** rectangle which is **not** congruent.

[1 mark]



1 4

- 18 A box contains 36 chocolates.

The chocolates are milk or dark and have hard or soft centres.

$\frac{4}{9}$ of the chocolates have soft centres.

$$\frac{4}{9} \times 36 = 16$$

There are twice as many milk chocolates as dark.

5 of the dark chocolates have soft centres.

- 18 (a) Complete the two-way table.

[4 marks]

	Hard centre	Soft centre
Milk	13	11
Dark	7	5

20 16

One chocolate is chosen at random.

- 18 (b) What is the probability that it is a dark chocolate with a soft centre?

[1 mark]

~~$\frac{5}{36}$~~

Answer _____

- 18 (c) What is the probability that it has a hard centre?

[1 mark]

~~$\frac{20}{36}$~~

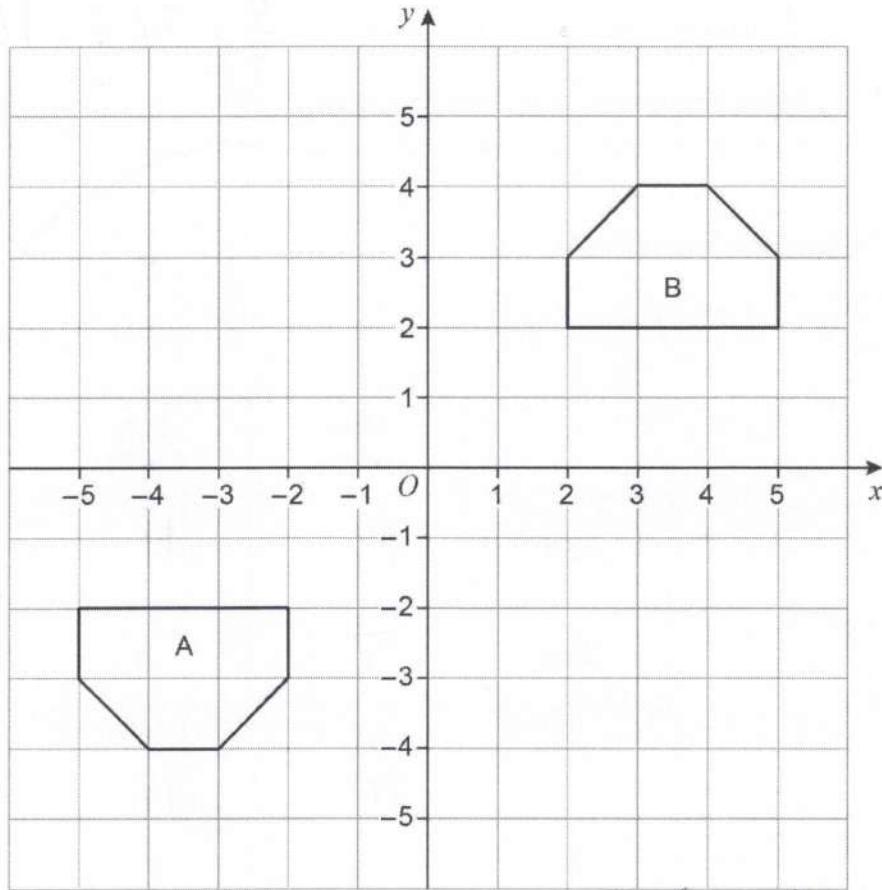
Answer _____



19

Describe fully the **single** transformation that maps shape A to shape B.

[3 marks]



Rotation, 180° , centre $(0, 0)$

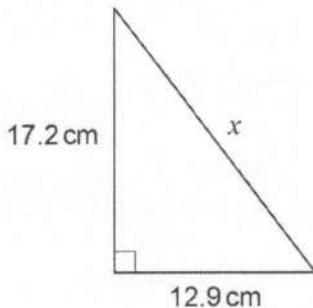


1 6

IB/M/Nov23/8300/2F

- 20 Use Pythagoras' theorem to work out the value of x .

[3 marks]



Not drawn
accurately

$$17.2^2 + 12.9^2 = 462.25$$

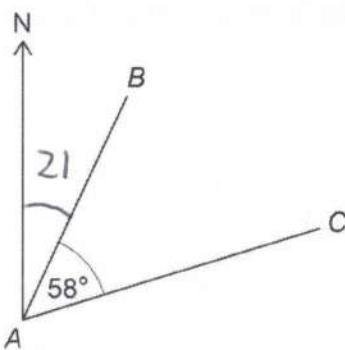
$$\sqrt{462.25}$$

$$x = \underline{\hspace{2cm}} \text{ cm}$$

Turn over for the next question



21



Not drawn accurately

Do not write outside the box

The 3-figure bearing of B from A is 021°

Work out the 3-figure bearing of C from A .

[2 marks]

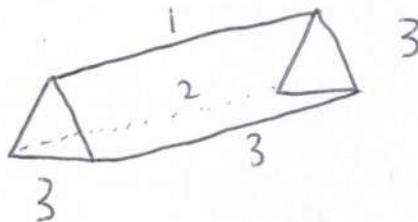
Answer

079

22

How many edges does a triangular prism have?

[1 mark]



Answer

9



1 8

IB/M/Nov23/8300/2F

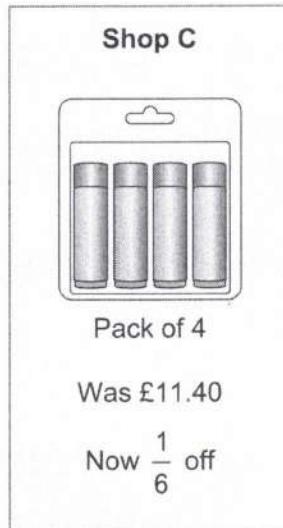
23

Three shops sell the same type and size of lip balm stick.

Do not write outside the box



£1.53



Which shop is the best value for 8 sticks and what is the total cost in that shop?

Show working to support your answer.

[5 marks]

(A) $2.39 \times 8 = 19.12$

(B) $(3.08 \times 4) + (1.53 \times 4) = 18.48$

(C) $2 \times 11.40 \times \frac{5}{6} = 19$

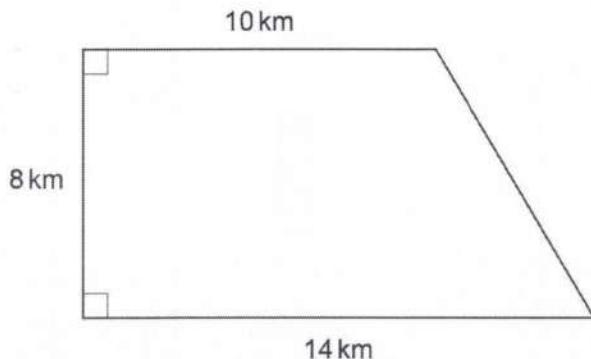
Shop B Total cost £ 18.48



- 24 The boundaries of a city form a trapezium.

Do not write outside the box

Not drawn accurately



$$\text{Population density} = \frac{\text{number of people}}{\text{area}}$$

The population density of the city is 9450 people per square kilometre.

Work out the number of people who live in the city.

[4 marks]

$$\text{Area} = \frac{1}{2} (10 + 14) \times 8 = 96$$

$$\text{Pd} \times \text{area} = \text{num. of people}$$

$$9450 \times 96$$

Answer

$$907200$$



2 0

25 Round 1 of voting for Head Student is taking place in a school.

25 (a) To reach round 2, a student must receive **at least** $\frac{4}{15}$ of the votes.

What is the largest possible number of students that can reach round 2?

Circle your answer.

[1 mark]

15

11

3

4

25 (b) There are 900 votes in round 1

Sean receives 180 votes.

Amy draws a pie chart to represent the results.

Here is her method to work out the angle needed for Sean.

$$180 \div 900 \times 100 = 20$$

The angle should be 20°

Is Amy's method correct?

Tick a box.

Yes

No

Give a reason for your answer.

[1 mark]

Amy has worked out the %

or

$$\frac{180}{900} \times 360 = 72^\circ$$

etc

6

Turn over ►

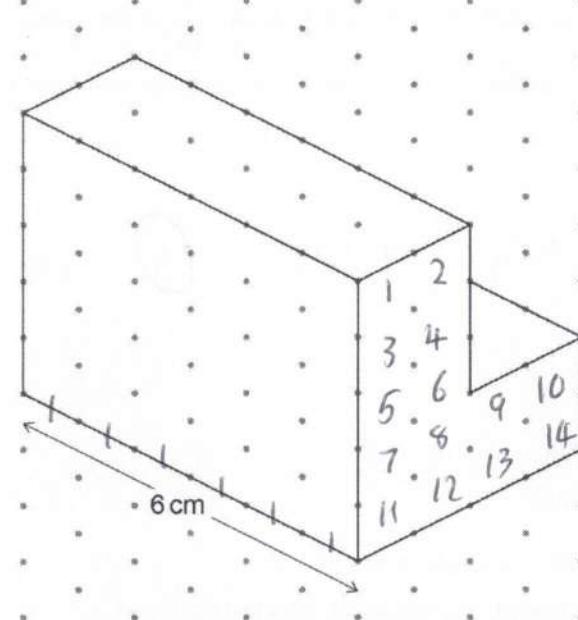


2 1

26

Here is a prism drawn on an isometric grid.

Do not write outside the box



Work out the volume of the prism.

[3 marks]

$$14 \times 6$$

Answer

84

cm³



- 27 Tasha drove 198 miles.

Her average speed for the first 3 hours was 45 miles per hour.

Her average speed for the rest of the journey was 31.5 miles per hour.

Work out her average speed for the whole journey.

[4 marks]

$$3 \times 45 = 135 \text{ miles}$$

B



$$\frac{198 - 135}{31.5} = 2 \text{ hrs}$$

$$\text{Speed} = \frac{\text{Total D}}{\text{Total T}} = \frac{198}{5}$$

Answer 39.6 miles per hour

Turn over for the next question

7

Turn over ►



2 3

- 28 Here is the term-to-term rule for a sequence.

Double the previous term and add 3

The first three terms of the sequence are $a + 1$ $2a + 5$ $4a + 13$

Show that the sum of the first **four** terms is a multiple of 3

[3 marks]

$$4^{\text{th}} = 8a + 26 + 3 = 8a + 29$$

$$\text{Total} = 15a + 48$$

$$= 3(5a + 16)$$

so it will be divisible by 3



2 4

- 29 A straight line passes through (3, 14) and (12, 32)

Work out the equation of the line.

Give your answer in the form $y = mx + c$

[3 marks]

$$m = \frac{18}{9} = 2$$

$$y = mx + c$$

$$y = 14, m = 2, x = 3$$

$$14 = 6 + c$$

$$so c = 8$$

Answer $y = 2x + 8$

END OF QUESTIONS

