Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

MATHEMATICS **0580/12**

Paper 1 (Core) **May/June 2022**

1 hour

You must answer on the question paper.

You will need: Geometrical instruments

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You should use a calculator where appropriate.
- You may use tracing paper.
- You must show all necessary working clearly.
- Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place for angles in degrees, unless a different level of accuracy is specified in the question.
- For π, use either your calculator value or 3.142.

INFORMATION

- The total mark for this paper is 56.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **12** pages. Any blank pages are indicated.

1 Write the number six hundred and seven thousand five hundred and thirty-two in figures.

607 532 [1]

2 61 62 63 64 65 66 67 68 69

From the list of numbers, write down

(a) a square number,

64 [1]

(b) a multiple of 13,

65 [1]

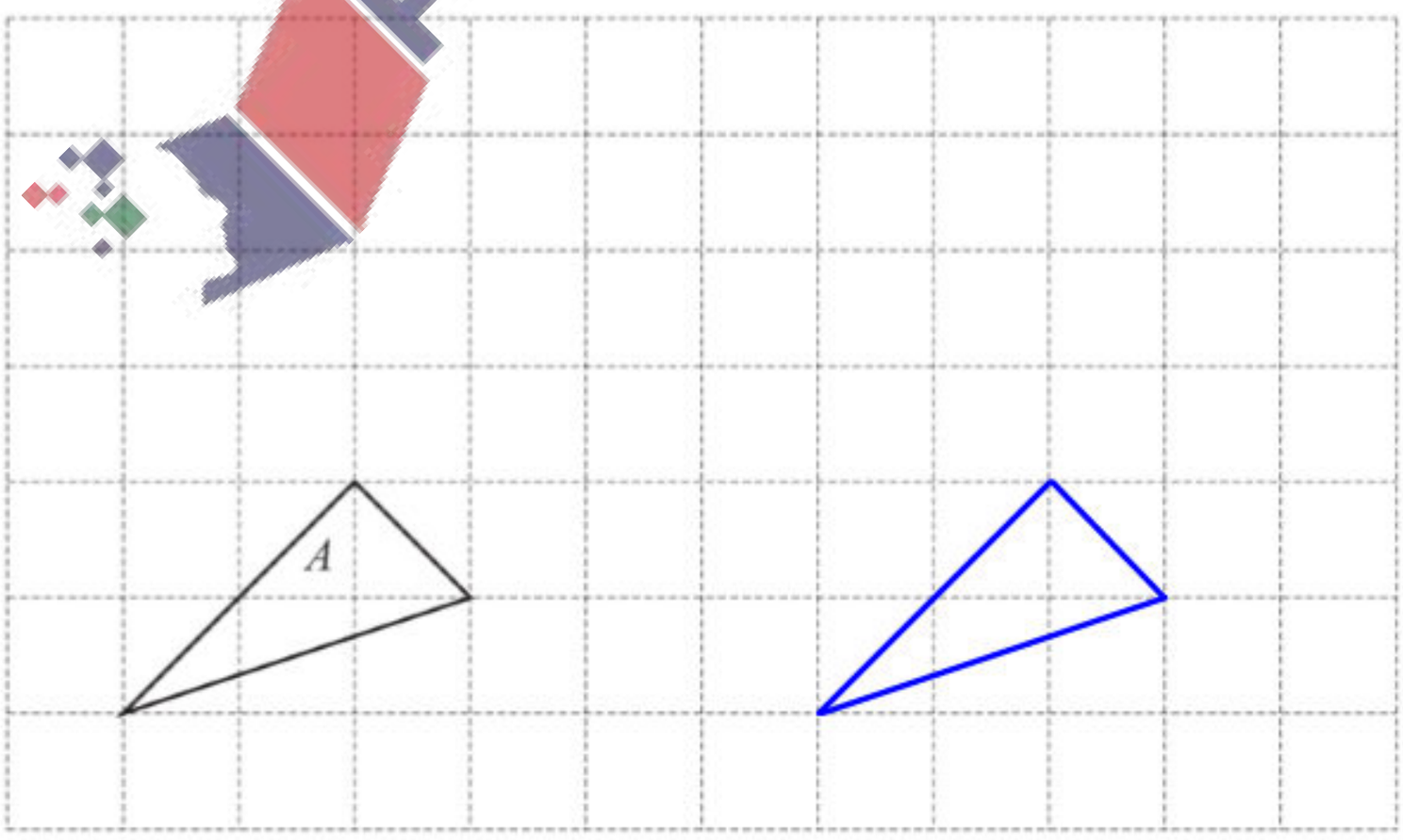
(c) a factor of 186,

62 [1]

(d) the prime numbers.

61 [2]

3 On the grid, draw a triangle that is congruent to triangle *A*.



[1]

4 The stem-and-leaf diagram shows the journey time to school of some students.

1	3	5	7	9	9
2	3	4	5		
3	0	3	4	6	7
4	2	4	5	8	

Key: 1|3 represents 13 minutes

Find

(a) the number of students with a journey time of more than 35 minutes,

6 ..... [1]

(b) the mode.

19 ..... min [1]

5 This is Arania's method to divide 213 by $12\frac{1}{2}$ without using a calculator.

$213 \div 12\frac{1}{2} = 426 \div 25$

$= 852 \div 50$

$= 1704 \div 100$

$= 17.04$

Show how to use Arania's method to work out $135 \div 12\frac{1}{2}$ without using a calculator.

$135 \div 12\frac{1}{2} = 270 \div 25$

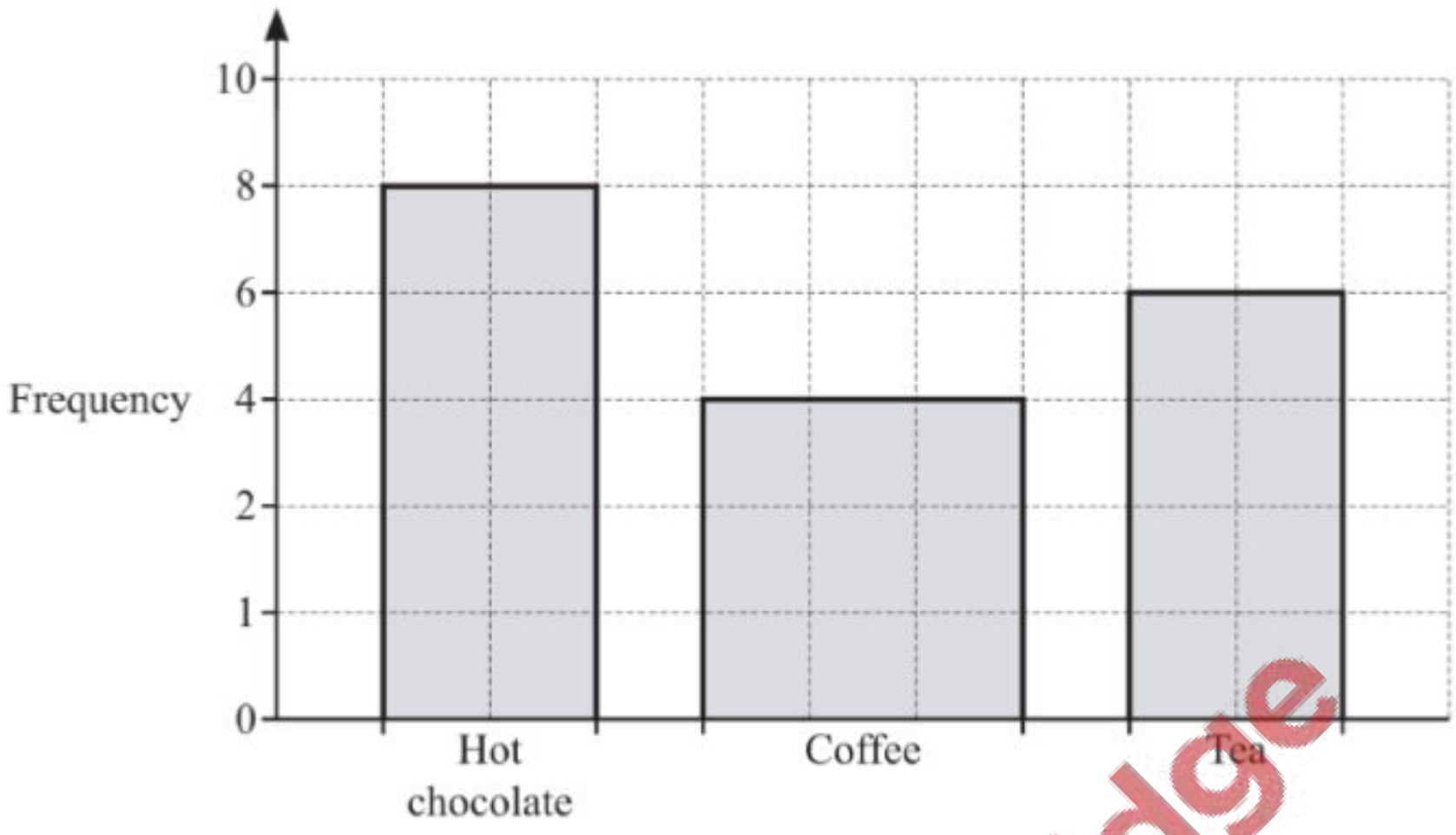
$= 540 \div 50$

$= 1080 \div 100$

$= 10.80$

[2]

6 Sammy records the favourite hot drink of some students.
He draws a bar chart to show this information.



Write down two different reasons why his bar chart is incorrect.

1. The width of the bars are not equal .....

2. The frequency scale is not uniform ..... [2]

7 Put one pair of brackets into each calculation to make it correct.

(a) $6 \times 7 - 5 + 4 = 16$ [1]

(b) $-2^2 + 24 \div 12 - 4 = 2$ [1]

8 At noon, the temperature is 4 °C.
At midnight, the temperature is −9 °C.

Work out the difference in temperature between noon and midnight.

★ $T_{diff} = 4°C - (-9°C) = 13°C$

13 °C [1]

9 Thibault records the number of cars of each colour in a car park.

Colour	Black	White	Silver	Red
Number of cars	8	5	4	3

(a) He draws a pie chart to show this information.

Calculate the sector angle for the red cars.

★ Sector angle (Red) $= \frac{3}{8 + 5 + 4 + 3} \times 360° = 54°$

54° [2]

(b) Two more white cars enter the car park and no cars leave the car park.

When these two white cars are included in the results, will the sector angle for the red cars change?
Without doing any further calculations, give a reason for your decision.

Yes because the total no. of cars increase while the no. of red cars stay the same [1]

10 $\mathbf{p} = \begin{pmatrix} 2 \\ 8 \end{pmatrix}$ $\mathbf{q} = \begin{pmatrix} -1 \\ 4 \end{pmatrix}$

Find

(a) $\mathbf{p} - \mathbf{q}$, $= \begin{pmatrix} 2 \\ 8 \end{pmatrix} - \begin{pmatrix} -1 \\ 4 \end{pmatrix} = \begin{pmatrix} 3 \\ 4 \end{pmatrix}$

$\begin{pmatrix} 3 \\ 4 \end{pmatrix}$ [1]

(b) $6\mathbf{p}$. $= 6\begin{pmatrix} 2 \\ 8 \end{pmatrix} = \begin{pmatrix} 12 \\ 48 \end{pmatrix}$

$\begin{pmatrix} 12 \\ 48 \end{pmatrix}$ [1]

11 Find the total surface area of a cuboid with length 8 cm, width 6 cm and height 3 cm.

$\star$ $A = 2lw + 2lh + 2wh$

$\Rightarrow A = (2 \times 8 \times 6)\text{cm}^2 + (2 \times 8 \times 3)\text{cm}^2 + (2 \times 6 \times 3)\text{cm}^2$

$\Rightarrow A = 180\text{cm}^2$

180 ..... cm^2 [3]

12 **(a)** The total cost of n bags of flour is $\$d$.

Write down an expression for the cost of one bag of flour.

$\$ \frac{d}{n}$ [1]

(b) A bag of rice costs $\$r$ and a bag of almonds costs $\$a$.

Pedro buys x bags of rice and y bags of almonds.

Write down an expression for the change that Pedro receives from a \$20 note.

$\$ 20 - rx - ay$ [2]

13 **(a)** Find the value of $\sqrt{68} \times \sqrt{153}$.

102 [1]

(b) Find the value of $6789^{\frac{1}{3}}$.
Give your answer correct to 2 decimal places.

18.94 [2]

14 Write the ratio $5 \times 10^{-1} : 2 : 3 \times 10^{1}$ in its simplest form.

$\frac{1}{2} : 2 : 30$

Multiply through by 2

1 : 4 : 60

1 : 4 : 60 [2]

15 The nth term of a sequence is $n^2 + 12$.

(a) Find the first three terms of this sequence.

★ $1^2 + 12 = 13$

★ $2^2 + 12 = 16$

★ $3^2 + 12 = 21$

13 , 16 , 21 [2]

(b) Is 5196 a term in this sequence?
Give a reason for your decision.

★ $5196 = n^2 + 12$

$\Rightarrow n^2 = 5184$

$\Rightarrow n = 72$

Yes because n is a positive integer

[2]

16 $33\frac{1}{3}\%$ π $\frac{1}{13}$ $343^{\frac{1}{3}}$ $\sqrt{3}$ 5.6×10^{-7}

Two of the numbers in this list are irrational.

Put a ring around each of these irrational numbers. [1]

17 $9^x \times 9^2 = 9^{12}$

Find the value of x.

$\Rightarrow 9^{x+2} = 9^{12}$

Since the bases are equal,

$\Rightarrow x + 2 = 12$

$\Rightarrow x = 10$

$x =$ 10 [1]

18 By writing each number in the calculation correct to 1 significant figure, find an estimate for the value of

$$\frac{27-2.3^2}{845.4\times0.048}.$$

$\Rightarrow \frac{30 - 2^2}{800 \times 0.05}$

$\Rightarrow \frac{\cancel{26}^{13}}{\cancel{40}_{20}} = \frac{13}{20}$

$\frac{13}{20}$ [2]

19 The length, l metres, of a piece of rope is 30.7 m, correct to 1 decimal place.

Complete this statement about the value of l.

* $l = 30.7\text{m} \pm \frac{0.1}{2}$

* $\text{LB}(l) = (30.7 - \frac{0.1}{2})\text{m} = 30.65\text{m}$

* $\text{UB}(l) = (30.7 + \frac{0.1}{2})\text{m} = 30.75\text{m}$

30.65 $\leqslant l <$ 30.75 [2]

20 **(a)** Simplify.

$$3(2a-b)-b$$

$\Rightarrow 6a - 3b - b$

$\Rightarrow 6a - 4b$

6a - 4b [2]

(b) Factorise.

$$x^2 - 8xy$$

x (x - 8y) [1]

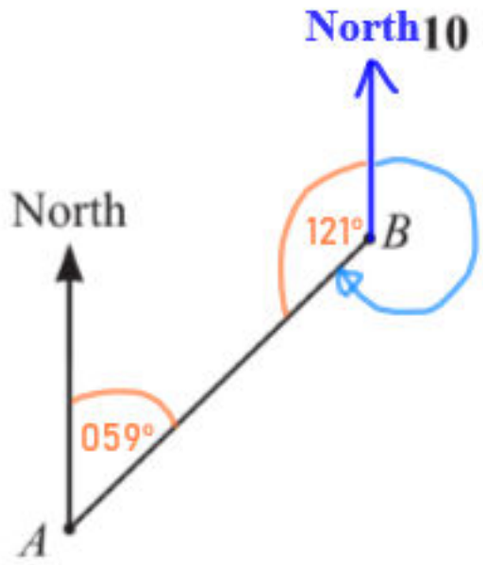
21 Find the lowest common multiple (LCM) of 24 and 28.

* 24 → 24, 48, 72, 96, 120, 144, 168, ...

* 28 → 28, 56, 84, 112, 140, 168, ...

168 [2]

22



NOT TO SCALE

The bearing of B from A is 059°.

Work out the bearing of A from B.

★ Bearing = 360° - 121° = 239°

239° [2]

23 **Without using a calculator**, work out $4\frac{1}{8} - 2\frac{5}{6}$.

You must show all your working and give your answer as a mixed number in its simplest form.

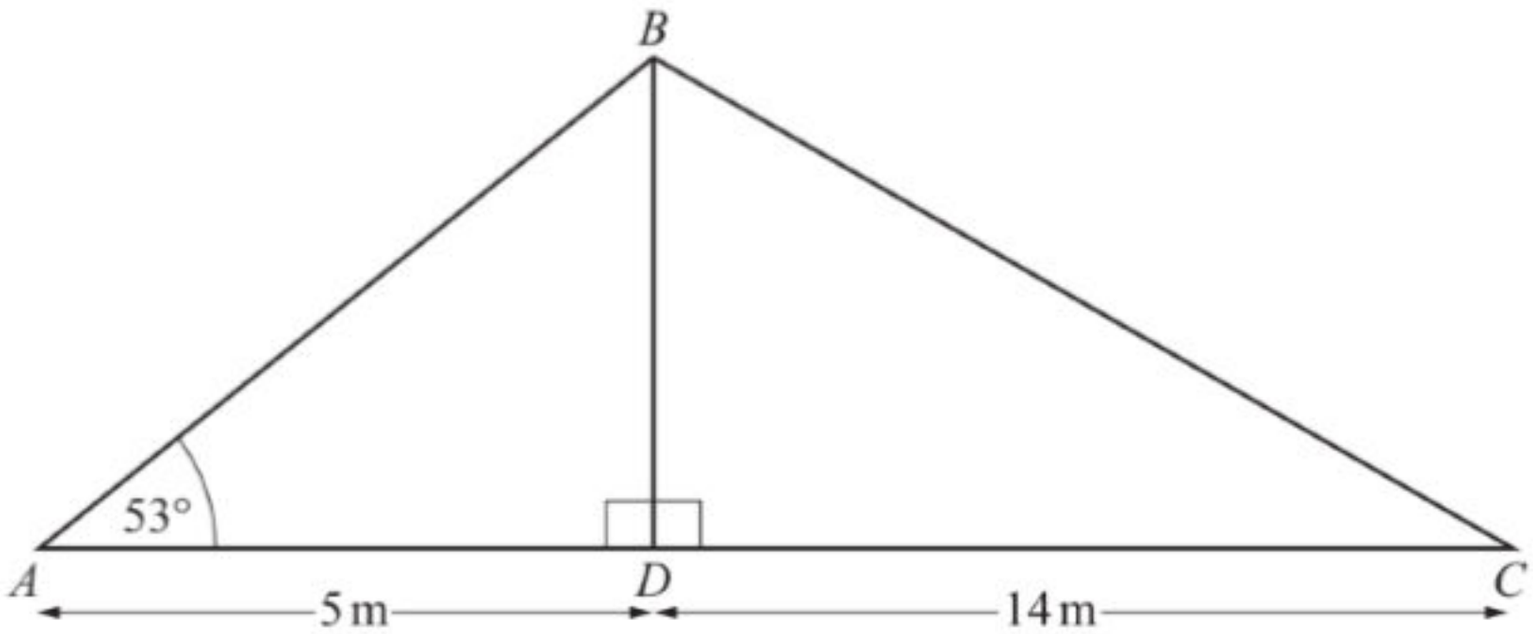
$\Rightarrow \frac{33}{8} - \frac{17}{6}$

$\Rightarrow \frac{99 - 68}{24}$

$\Rightarrow \frac{31}{24} = 1\frac{7}{24}$

$1\frac{7}{24}$ [3]

24



NOT TO SCALE

The diagram shows two right-angled triangles, ABD and BCD.
$AD = 5\text{m}$, $DC = 14\text{m}$ and angle $BAD = 53°$.

Calculate BC.

✱ $BC^2 = BD^2 + DC^2$

Finding BD

✱ $\tan 53° = \frac{BD}{5m}$

⇒ $BD = (5 \tan 53°)m$

⇒ $BC = (\sqrt{(5 \tan 53°)^2 + 14^2})m$

⇒ BC = 15.5m (3 sig. figs.)

$BC =$ ..... 15.5 ..... m [4]

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