Cambridge Assessment International Education

Cambridge Lower Secondary Checkpoint

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

8643639165

MATHEMATICS **0862/01**

Paper 1 **April 2023**

1 hour

You must answer on the question paper.

You will need: Geometrical instruments
Tracing paper (optional)

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 show all your working in the booklet.
- You are **not** allowed to use a calculator.

INFORMATION

- The total mark for this paper is 50.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **16** pages.

1 A regular polygon has exactly 8 lines of symmetry.

Tick (✓) to show if these facts about the polygon are true, false or if you cannot tell.

	True	False	Cannot tell
The polygon has 16 sides.	☐	✓	☐
The polygon has rotational symmetry of order 8	✓	☐	☐

[1]

2 Carlos rolls a fair six-sided dice 60 times.

Calculate how many times Carlos should expect to roll a 3

Possibility to roll 3: $\frac{1}{6}$

$\frac{1}{6} \times 60 = 10$

10 [1]

3 Write the letter for each calculation in the correct column of the table.
One has been done for you.

A	B	C	D
7×6	$7^5 \times 7 = 7^6$	$7^6 \div 7^0 = 7^6$	$7^2 \times 7^3 = 7^5$

Equal to 7^6	Not equal to 7^6
B C	A D

[1]

4 Expand and simplify.

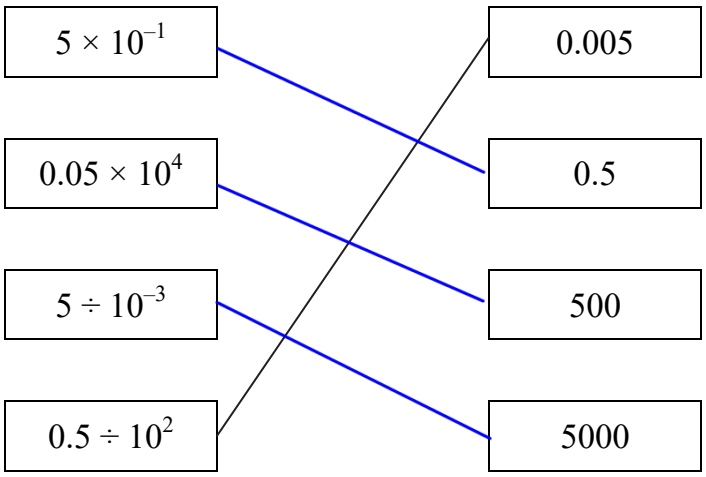
$(c + 4)(c + 10)$

$= c^2 + 4c + 10c + 4 \times 10$

$= c^2 + 14c + 40$

$c^2 + 14c + 40$ [2]

5 Draw a line to match each calculation to its answer.
One has been done for you.



[1]

6 Work out the value of $(10 - 2x)^4$ when $x = 4$

$(10 - 2 \times 4)^4$

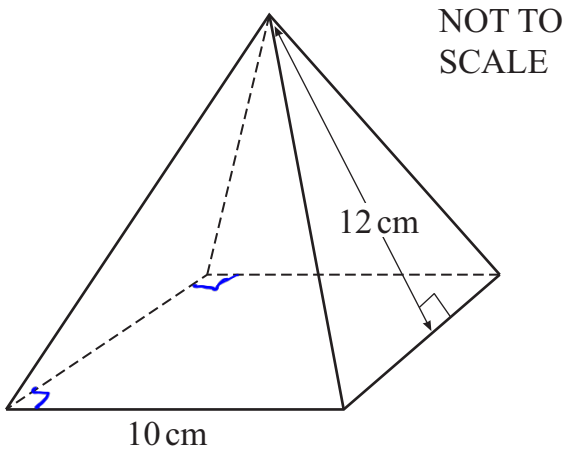
$= 2^4$

$= 16$

16 [2]

7 A pyramid has

- a square base with a side length of 10 cm
- four congruent triangular faces each with a height of 12 cm.



Calculate the surface area of the pyramid.

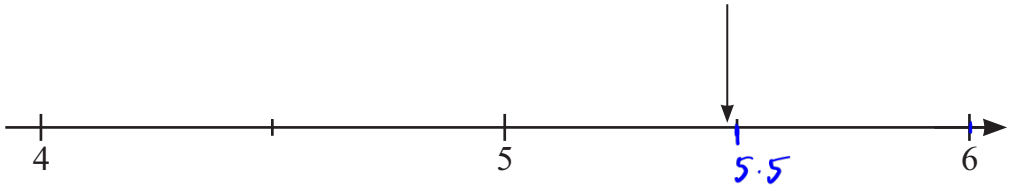
Area$_{base}$: $10^2 = 100$

Area$_{1\ side}$: $\frac{10 \times 12}{2} = 60$

Surface are : $100 + 4 \times 60 = 340$

340 cm^2 [2]

8 The arrow points to a number.

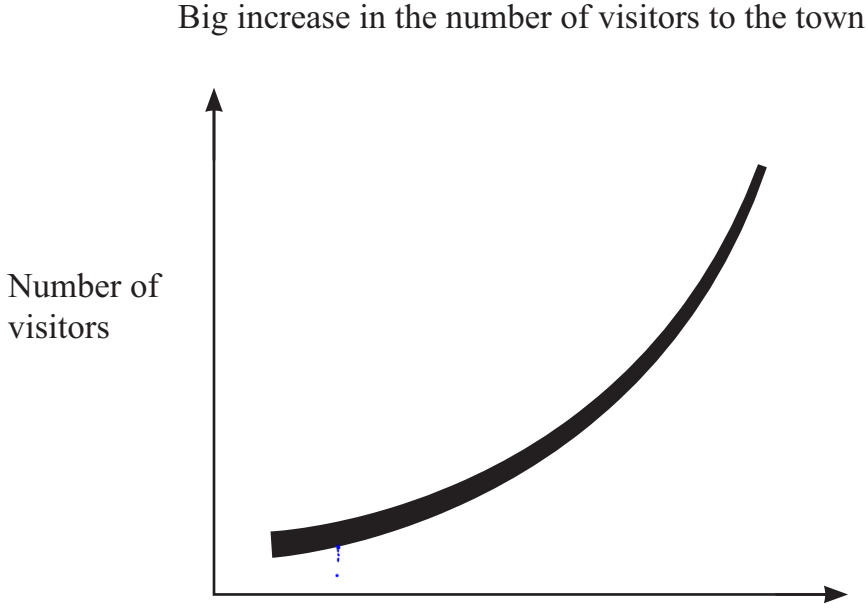


Draw a ring around the number the arrow points to.

$\sqrt{11}$ $\sqrt{22}$ $\sqrt{30}$ $\sqrt{35}$

? $= 5.5^2 \simeq 25$ [1]

9 Ahmed draws this graph to show how the number of visitors to his town has increased.



Give **one** reason why the graph could be misleading.

The horizontal axis does not have information

.....[1]

10 $\frac{1}{n}$ is equivalent to a recurring decimal.

n is a whole number.

Safia says, 'n must be greater than 5'

$\frac{1}{3} = 0.3333\ldots$

Write a number to complete this sentence.

Safia is **not** correct because the value of n could be 3 [1]

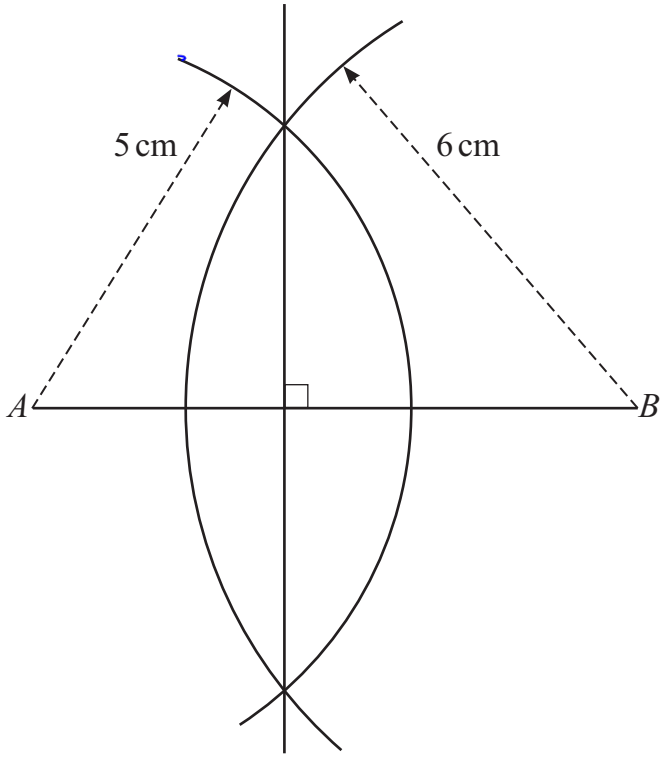
11 **(a)** Write 70 000 in standard form.

7×10^4 [1]

(b) Write 7.5×10^{-3} as an ordinary number.

0.0075 [1]

12 Here is Eva's method for drawing the perpendicular bisector of line AB.



She draws an arc radius 5 cm centre A.
She draws an arc radius 6 cm centre B.
She draws a line to connect the points where her arcs intersect.

Explain why Eva's method is **not** correct.

She uses different radii

[1]

13 Here is a formula.

$$y = \sqrt{w-2}$$

Draw a ring around the correct rearrangement of the formula.

$w = \sqrt{y+2}$ $\quad$ $w = \sqrt{y}+2$ $\quad$ $w = (y+2)^2$ $\quad$ $w = y^2+2$

$y^2 = w - 2$
$w = y^2 + 2$

[1]

14 **(a)** Write down the value of $\frac{7}{3} \times 5 \times \frac{3}{7}$

$= \frac{7}{3} \times \frac{5}{1} \times \frac{3}{7}$

$= \frac{7 \times 5 \times 3}{3 \times 1 \times 7} = 5$

5 [1]

(b) Calculate $\frac{9}{10} \div 2\frac{2}{5}$

Give your answer as a fraction in its simplest form.

$\frac{9}{10} \div \frac{12}{5}$

$= \frac{9}{10} \times \frac{5}{12}$

$= \frac{3 \times 3 \times 5}{2 \times 5 \times 3 \times 4}$

$= \frac{3}{2 \times 4}$

$= \frac{3}{8}$

$\frac{3}{8}$ [3]

15 The internal storages of three games consoles are

500 000 MB 5×10^8 B

32 GB 3.2×10^{10} B

1 TB 10^{12} B

Write these values in order of size, starting with the smallest.

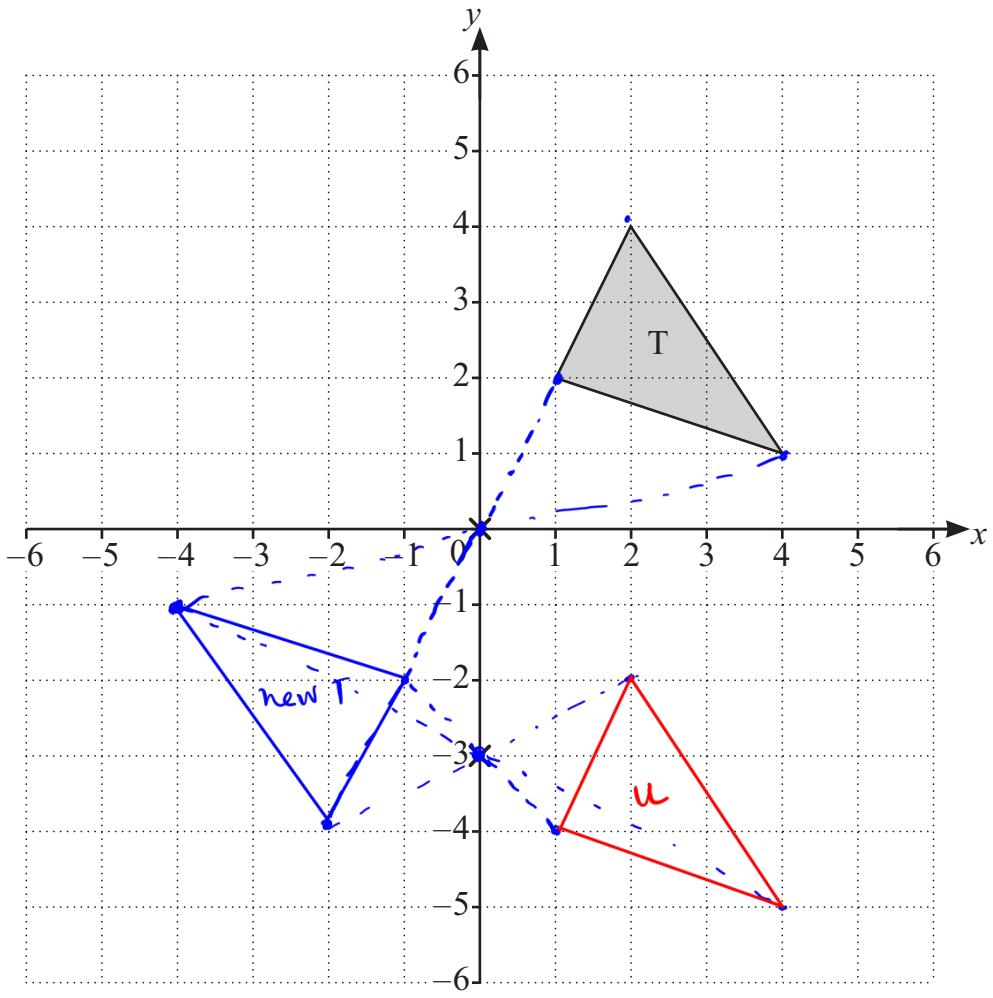
32 GB smallest

500 000 MB

1 TB largest

[1]

16 The diagram shows a triangle T drawn on a grid.



(a) Triangle T is rotated by 180° about centre (0, 0).
The new triangle is then rotated by 180° about centre (0, –3) to give triangle U.

Draw the position of triangle U on the grid.

[2]

(b) Draw a ring around the type of transformation that maps triangle T onto triangle U.

translation reflection rotation enlargement

[1]

17 The table shows information about the masses of 70 boxes.

median = $\frac{35\text{th} + 36\text{th}}{2}$

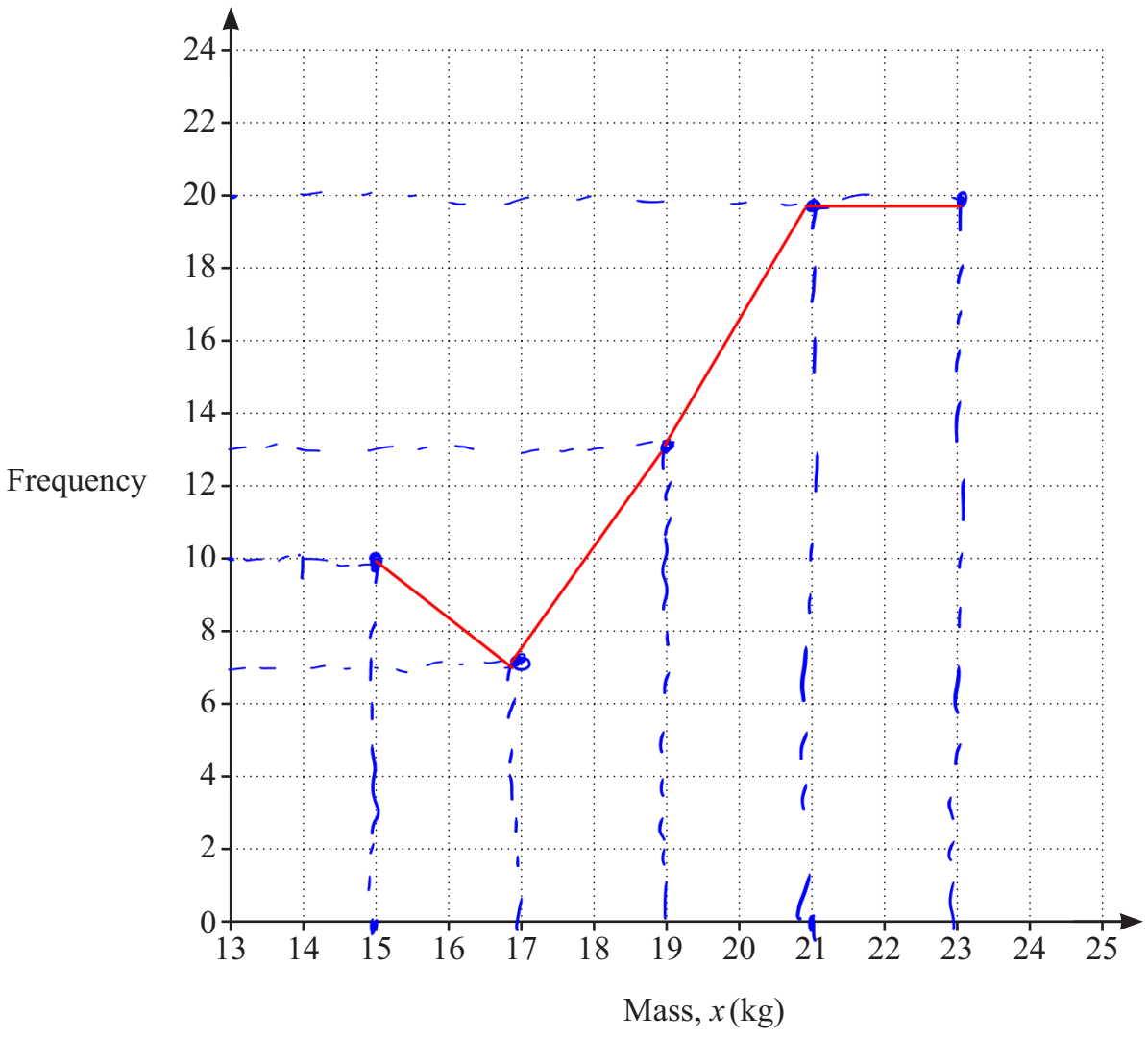
mid point	Mass, x (kg)	Frequency	cumulative fr
15	$14 \leq x < 16$	10	10
17	$16 \leq x < 18$	7	17
19	$18 \leq x < 20$	13	30
21	$20 \leq x < 22$	20	50
23	$22 \leq x < 24$	20	70

(a) Draw a ring around the interval that contains the median.

$14 \leq x < 16$ $16 \leq x < 18$ $18 \leq x < 20$ $20 \leq x < 22$ $22 \leq x < 24$

[1]

(b) Draw a frequency polygon to show the information in the table.



[2]

18 **(a)** The nth term of a sequence is $n^2 + 5$

Find the 7th term of the sequence.

$7^2 + 5 = 49 + 5 = 54$

54 [1]

(b) Here are the first five terms of a different sequence.

1st 2nd 3rd 4th 5th

0, 3, 8, 15, 24

$1 = 1^2$ $4 = 2^2$ $9 = 3^2$ $16 = 4^2$ $25 = 5^2$

Find an expression for the nth term of this sequence.

$n^2 - 1$ [1]

19 Find the coordinates of two points on the line $y = 5 - 3x$ which have

a negative x-coordinate
and
a y-coordinate which is a multiple of 4

(−1 , 8)

(−5 , 20)

[2]

20 Chen records the length, in millimetres, of 10 shells.

34	46	37	55	38
52	68	40	31	47

He draws this stem-and-leaf diagram to show the data.

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

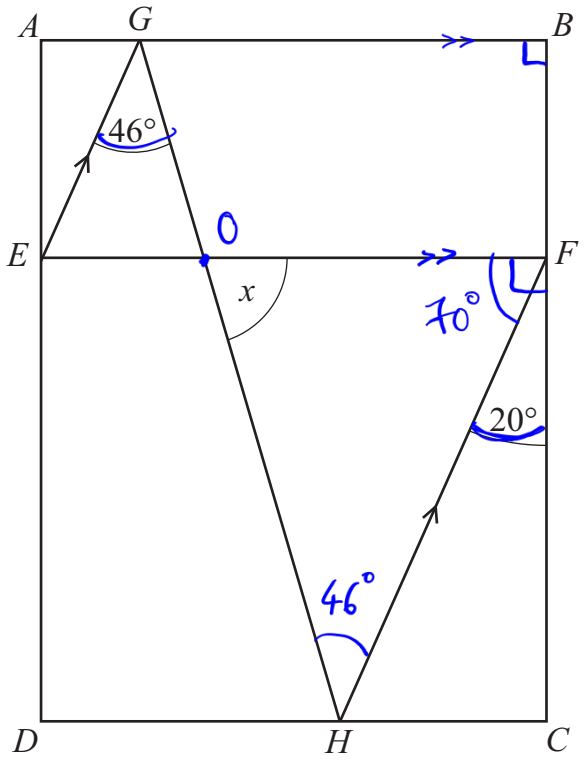
Chen's stem-and-leaf diagram contains some errors.

Draw a correct stem-and-leaf diagram to show Chen's data.

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

[2]

21 The diagram shows a rectangle $ABCD$.



NOT TO SCALE

EF is parallel to AB.
EG is parallel to HF.

Calculate the size of the angle marked x.

$\widehat{GHF} = \widehat{EGH} = 46°$

$\widehat{EFC} = \widehat{ABC} = 90°$

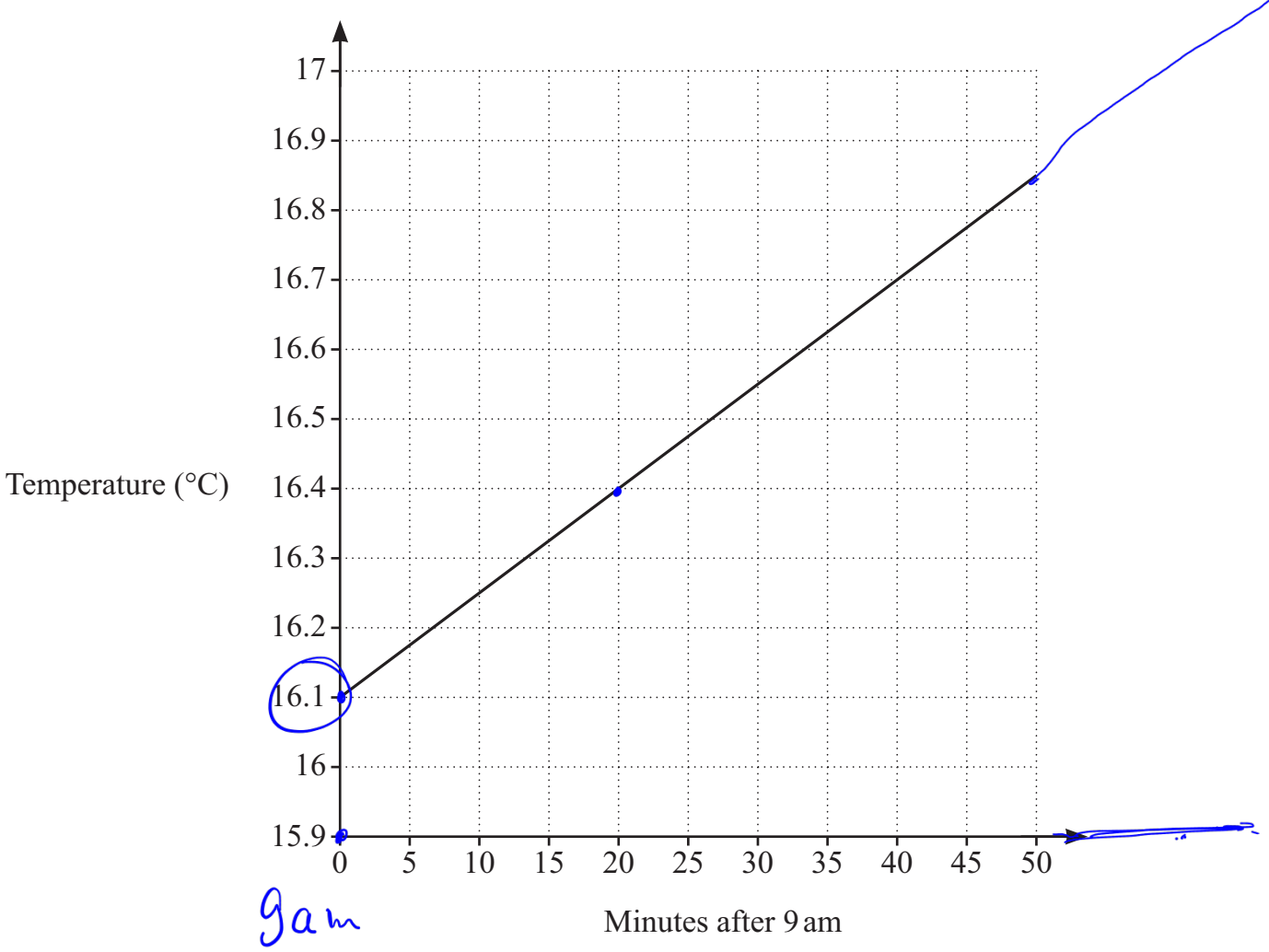
$\widehat{EFH} = 90° - 20° = 70°$

$\widehat{HOF} = 180° - 46° - 70° = 64°$

$x =$ 64° [2]

22 Lily heats the water in her swimming pool.

The graph shows the temperature, in °C, of the water for the first 50 minutes after 9 am.



The temperature of the water continues to increase at this constant rate.

Find the temperature of the water at 11 am.

9 am —(2 hours = 120 minutes)→ 11 am

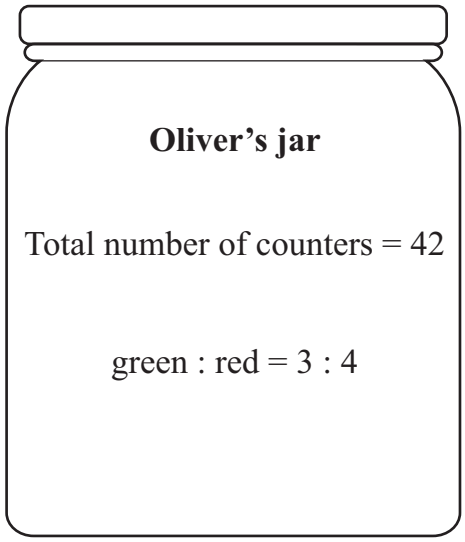
20 minutes : increase 0.3 °C

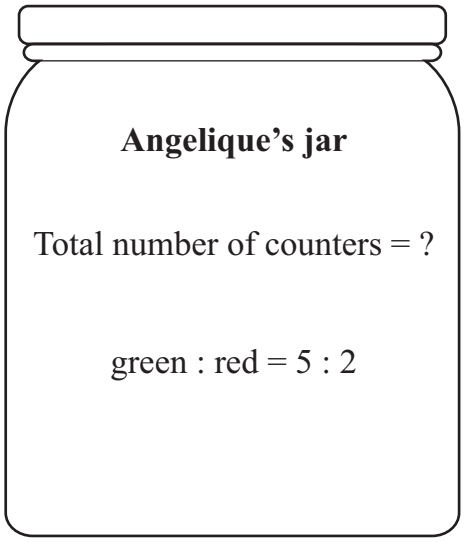
120 minutes : increase 1.8 °C

Temperature at 11 am : 16.1 + 1.8 = 17.9

17.9 ..... °C [2]

23 Oliver and Angelique each have a jar that contains only green counters and red counters.





Angelique has the same number of **red** counters as Oliver.

Find the total number of counters in Angelique's jar.

The number of red counters in Oliver's jar: $\frac{4}{3+4} \times 42 = 24$

Angelique jar: 24

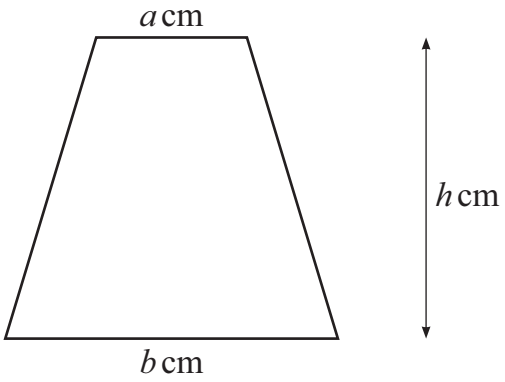
$\frac{2}{5+2} \times ? = 24$

$? = 24 : \frac{2}{7}$

$? = 84$

84 [3]

24 The area of a trapezium is 24.5 cm^2.



NOT TO SCALE

a, b and h are integers greater than 1 $a, b, h > 1$

$a < b$.

Find a set of possible values for a, b and h.

$\frac{1}{2} \times (a+b) \times h = 24.5$

$(a+b) \times h = 49$

$(2+5) \times 7$

$a =$ 2

$b =$ 5

$h =$ 7

[2]

25 Solve.

$$\frac{12}{5-2x} = -3$$

$5 - 2x = \frac{12}{-3} = -4$

$2x = 5 + 4 = 9$

$x = 4.5$

$x =$ 4.5 [3]

26 A bag contains a large number of coloured balls.
Each ball is red or green or blue or yellow.
A ball is picked at random from the bag.
The table shows some of the probabilities.

Colour of ball	Red	Green	Blue	Yellow
Probability	0.3	0.1	x	$1.5x$

Calculate the probability that the ball picked is blue or green.

$0.3 + 0.1 + x + 1.5x = 1$

$0.4 + 2.5x = 1$

$2.5x = 0.6$

$x = \frac{0.6}{2.5} = \frac{6}{25}$

Probability that the ball picked is blue or green:

$0.1 + \frac{6}{25} = \frac{1}{10} + \frac{6}{25}$

$= \frac{10}{100} + \frac{24}{100}$

$= \frac{34}{100}$

$= 0.34$

0.34 [4]