Centre Number	Candidate Number	Candidate Name

NAMIBIA SENIOR SECONDARY CERTIFICATE

MATHEMATICS ORDINARY LEVEL

4324/4

PAPER 4 (Extended)

2 hours 30 minutes

Marks 120

2019

Additional Material: Geometrical instruments
Non-programmable calculator
Tracing paper (optional)

INSTRUCTIONS AND INFORMATION TO CANDIDATES

- Candidates answer on the Question Paper in the spaces provided.
- Write your Centre Number, Candidate Number and Name in the spaces at the top of this page.
- Write in dark blue or black pen.
- You may use a soft pencil for any diagrams or graphs.
- Do not use correction fluid.
- Do not write in the margin *For Examiner's Use*.

- Answer **all** questions.

- If working is needed for any question it must be shown below, or where working is indicated.
- The number of marks is given in brackets [ ] at the end of each question or part question.
- Non-programmable calculators may be used.
- If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to **three** significant figures. Give answers for angle sizes to **one** decimal place.
- For π , either use your calculator value, or use 3.142.

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Marker	
Checker	

This document consists of **16** printed pages.

Republic of Namibia

MINISTRY OF EDUCATION, ARTS AND CULTURE

1 (a) 81 82 83 85 $\sqrt{86}$ $\sqrt[3]{89}$ 88

From the list above, select a number which is

(i) a multiple of 4,

Answer **(a) (i)**..... [1]

(ii) a prime number,

Answer **(a) (ii)**..... [1]

(iii) a square number,

Answer **(a) (iii)**..... [1]

(iv) a factor of 246,

Answer **(a) (iv)**..... [1]

(v) an irrational number.

Answer **(a) (v)**..... [1]

(b) Work out 0.3451 × 2.321.

(i) Write down the whole calculator display.

Answer **(b) (i)**..... [1]

(ii) Round off the answer in part **b (i)** to 3 significant figures.

Answer **(b) (ii)**..... [1]

(iii) Express the answer in part **b (i)** in a standard form.

Answer **(b) (iii)**..... [2]

(c) Round each of the following numbers correct to 1 significant figure and use your rounded values to work out an estimate for the answer.

$$\frac{1.9 - 1.09}{209 \times 3.65}$$

Answer **(c)** ..... [3]

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2 Pandu bought a car. She paid a deposit of N$ 75 000.00, which is equivalent to 30% of the cash price of a car. She used a bank loan to pay off the remaining balance of the cash price.

(a) Determine the cash price of the car.

Answer **(a)** N$..... [3]

(b) The loan period is 5 years. The bank charges Pandu 8.5% compound interest annually on the loan she took. Pandu pays off her loan in equal monthly instalments.

Calculate her monthly instalment.

Answer **(b)** N$..... [5]

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(c) Work out the balance of her loan after the 55th instalment.

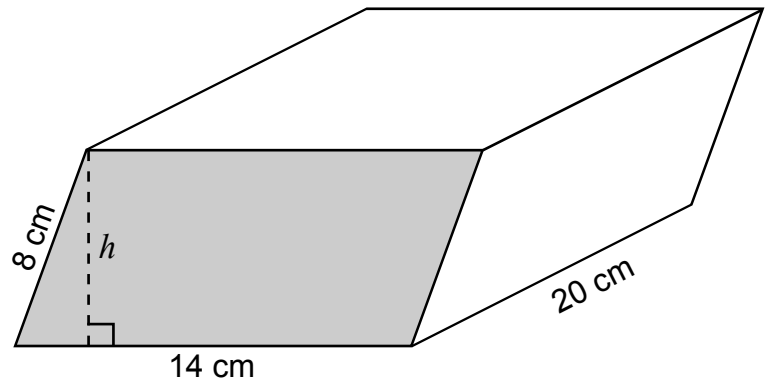
Answer **(c)** N$..... [3]

(d) Calculate the amount of interest, in N$, she will pay over 5 years.

Answer **(d)** N$..... [2]

3 A model of a chocolate box has a cross-sectional area of a parallelogram.

NOT TO SCALE



(a) The area of a parallelogram is 64 cm^2.

Calculate the perpendicular height, h, of the chocolate box.

Answer **(a)** .....cm [2]

(b) (i) Calculate the volume of the chocolate box.

Answer **(b) (i)**..... cm^3 [2]

(ii) Convert the answer to part **b(i)** to mm^3.

Answer **(b) (ii)**..... mm^3 [1]

(c) In a billboard advertisement of this chocolate box, the base of the equivalent shaded area shown in the diagram is 7 m long.

Calculate the area in the billboard advertisement equivalent to the shaded area in the diagram.

Answer **(c)** ..... cm^2 [3]

For Examiner's Use

4 **(a)** **(i)** Factorise $2x^2 - 4x + 3xy - 6y$ completely.

Answer **(a) (i)** ..... [2]

(ii) Express $x^2 - 2x - 35$ in the form $a(x + p)^2 + q$.

Answer **(a) (ii)** ..... [3]

(b) Solve for y,

(i) $y^2 - y + 12 = 0$,

Answer **(b) (i)** y = ...or ..... [3]

(ii) $y^{\frac{2}{3}} = 9$.

Answer **(b) (ii)** y = ... [2]

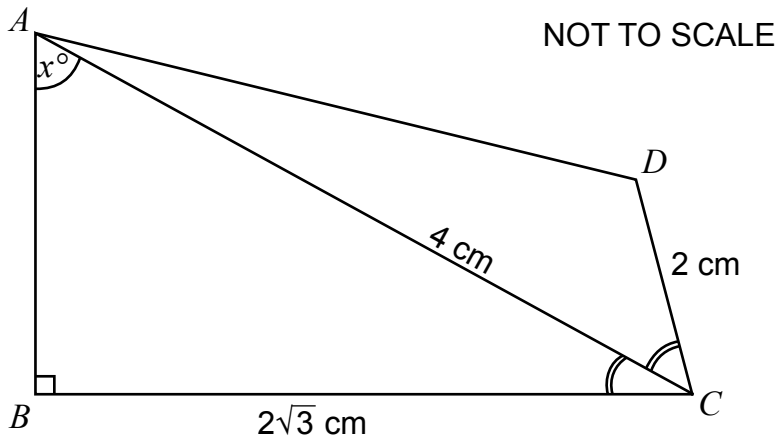
(c) Solve simultaneously,

$2^{4x - 16} = 2^{12x}$,

$y^2 + x = 7$.

Answer **(c)** x =..... y =..... [5]

5 In the diagram below, ABC and ACD are triangles with angle $ABC = 90°$, $BC = 2\sqrt{3}$ cm, $AC = 4$ cm and $CD = 2$ cm. Angle ACD = angle ACB and angle $CAB = x°$.



(a) Determine the length AB.

Answer **(a)** .....cm [2]

(b) Show, by calculation, that $x = 60°$.

Answer **(b)**

[2]

(c) Calculate

(i) length AD,

Answer **(c) (i)** AD = ...cm [4]

(ii) the area of triangle ADC.

Answer **(c) (i)** ..... cm^2 [2]

6 It is given that $f(x) = (ax)^2$, passes through the point (2,256).

(a) Calculate the possible values of the constant a.

Answer **(a)** a = ... [3]

(b) Write $f(x)$ in its simplest form.

Answer **(b)** ..... [1]

(c) It is given that $g(x) = 2x - 1$.

Find

(i) $g(-3)$,

Answer **(c) (i)** ..... [2]

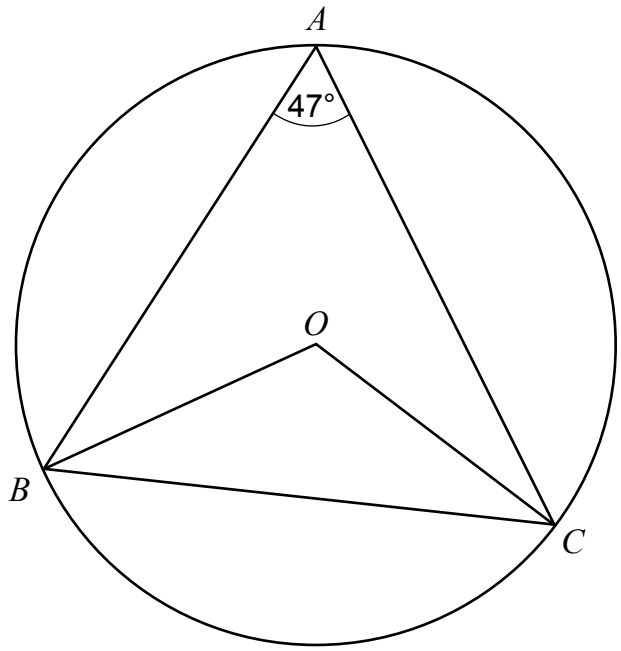
(ii) $g^{-1}(x)$,

Answer **(c) (ii)** ..... [2]

(iii) $fg(x)$ in its expanded form.

Answer **(c) (iii)** ..... [3]

7 A circle with centre O passes through points A, B and C. Angle BAC = 47°.



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Determine, by giving reasons, the size of angle

(a) BOC,

Answer **(a)** ..... [1]

Reason..... [1]

(b) OCB.

Answer **(b)** ..... [2]

Reason..... [1]

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8 A shop sells two types of toys. Toy A and Toy B. The shop owner pays N$ 8 for Toy A and N$ 14 for Toy B.

The shop owner estimates that no more than 2 000 toys will be sold every month and he does not plan to invest more than N$ 20 000 in inventory of these toys.

(a) Let x be the number of Toy As and y be the number of Toy Bs sold.

Show that $4x + 7y \leq 10\,000$.

Answer **(a)**

[1]

(b) Write down three other inequalities involving x and / or y.

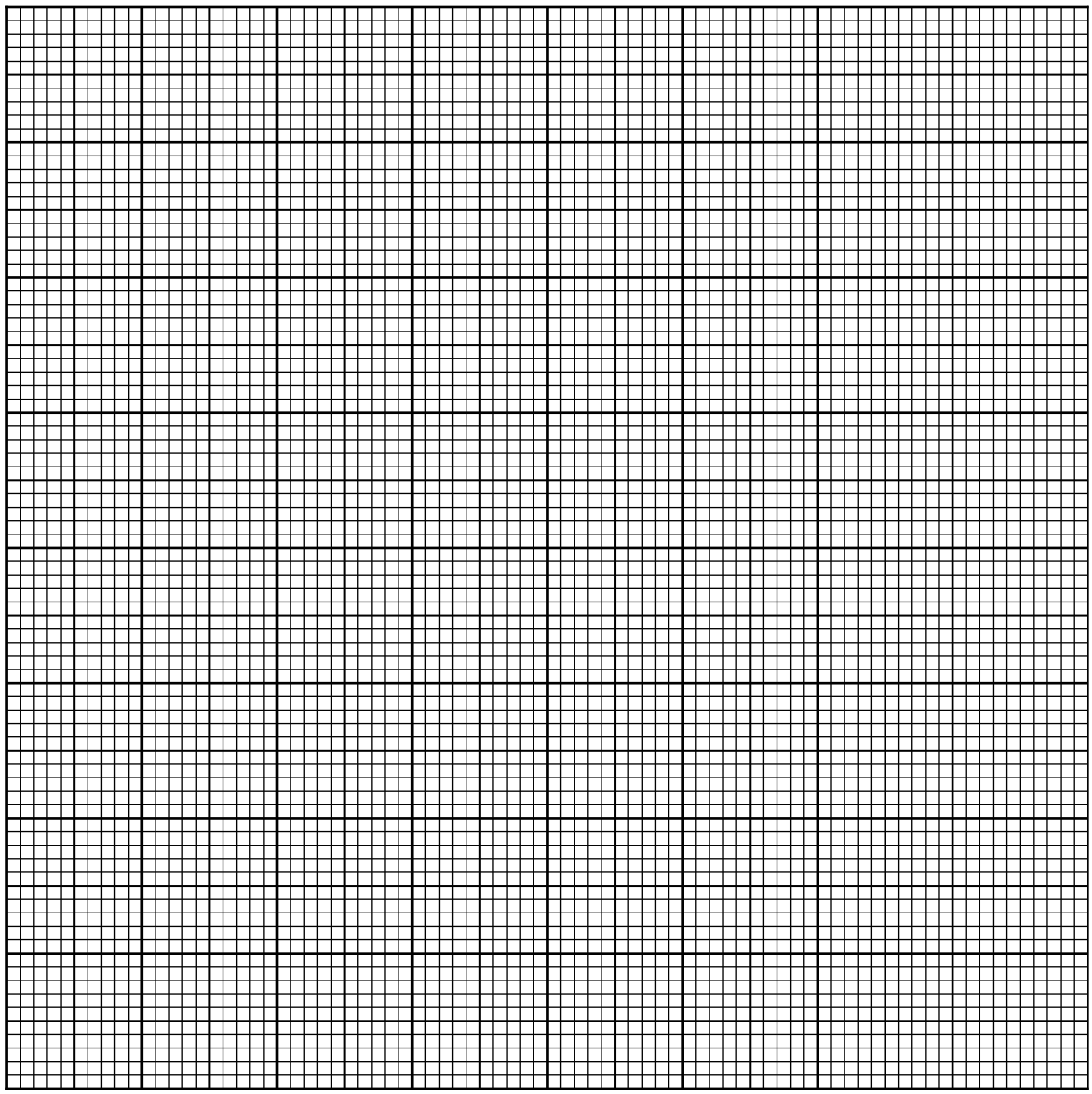
Answer **(b)** .....

.....

..... [3]

For Examiner's Use

(c) Using 2 cm = 500 toys on both axes, draw the four inequalities on the grid provided below.



[6]

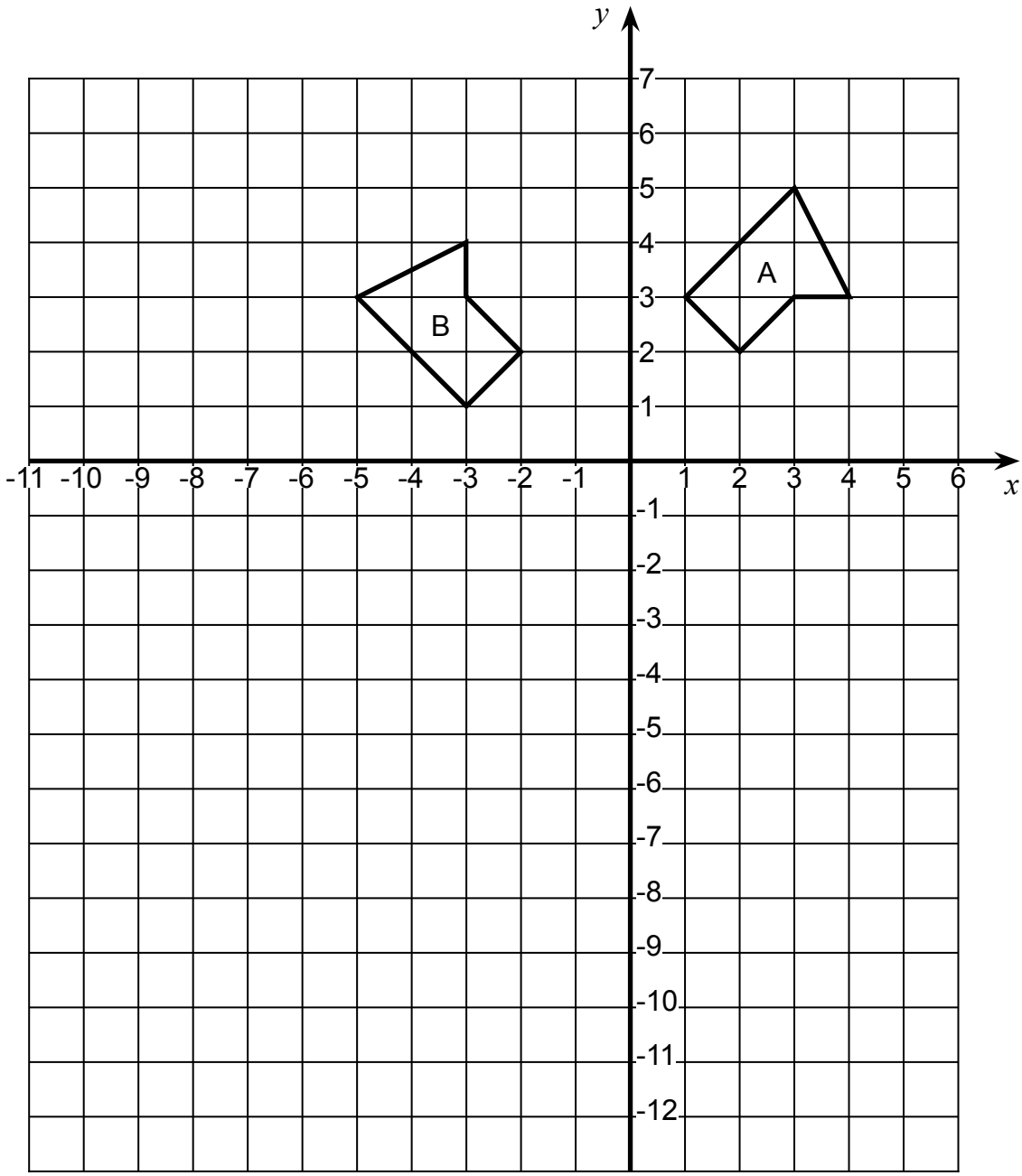
(d) One unit of Toy A yields a profit of N$ 2 while a unit of Toy B yields a profit of N$ 3. [Hint: P = $2x + 3y$]

How many units of each type of toys should be sold in order to maximize his monthly total profit.

Answer **(d)** ..... [3]

For Examiner's Use

9



(a) Describe fully the transformation that maps polygon A onto polygon B.

Answer **(a)**.....

.....

..... [3]

(b) Translate polygon B by vector $\begin{pmatrix} 6 \\ -5 \end{pmatrix}$. Label it C. [2]

(c) Enlarge polygon A through centre (0,0), scale factor −2. Label it D. [2]

10 Study the arithmetic progression below.

$7\frac{1}{3}$ 8 $8\frac{2}{3}$ $9\frac{1}{3}$ 10 ...

(a) Write down the next term.

Answer **(a)** ..... [1]

(b) Determine the n^{th} term.

Answer **(b)** ..... [4]

(c) Which term of the sequence will be equal to $30\frac{2}{3}$?

Answer **(c)** ..... [3]

(d) Find the sum of the first 36 terms.

Answer **(d)** ..... [3]

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11 The heights, h, of 130 learners at Ongwe CS in Grade 8, 9 and 10, were recorded as follows.

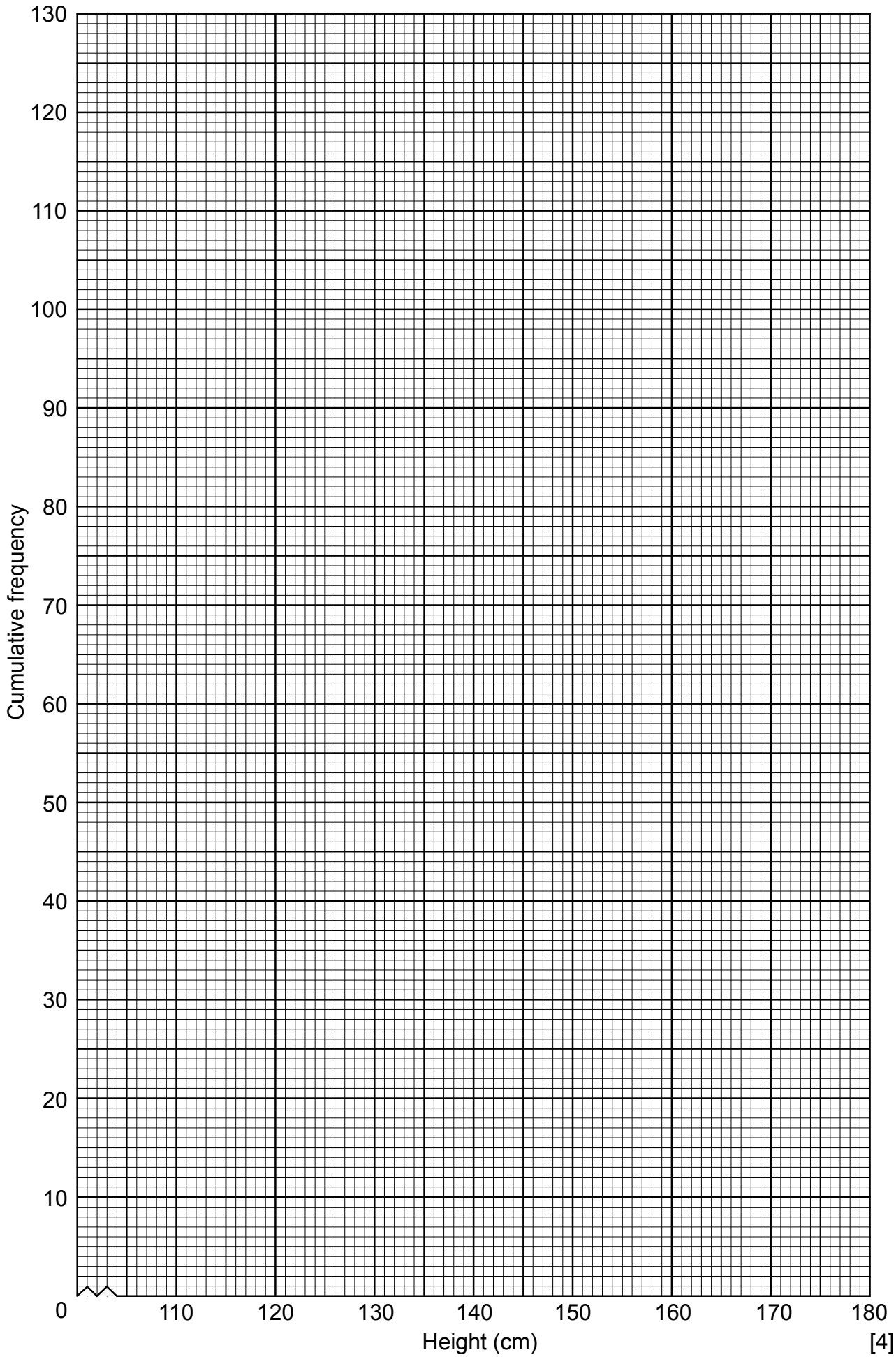
Height (cm)	Frequency
$118 \leq h < 128$	7
$128 \leq h < 137$	20
$137 \leq h < 145$	21
$145 \leq h < 155$	47
$155 \leq h < 162$	15
$162 \leq h < 173$	16
$173 \leq h < 180$	4

(a) Complete the cumulative frequency table for the heights of the learners.

Height (cm)	Cumulative Frequency
$h < 118$	0
$h < 128$	
$h < 137$	
$h < 145$	
$h < 155$	
$h < 162$	
$h < 173$	
$h < 180$	

[3]

(b) Use the grid on **page 15** to draw a cumulative frequency curve (ogive) that represent the given data.


Cumulative frequency
0
10
20
30
40
50
60
70
80
90
100
110
120
130
110
120
130
140
150
160
170
180
Height (cm)

[4]

(c) Use your cumulative frequency curve to determine

(i) lower quartile,

Answer **(c) (i)** ..... [1]

(ii) upper quartile.

Answer **(c) (ii)** ..... [1]

(d) Determine

(i) the modal class of the data,

Answer **(d) (i)** ..... [1]

(ii) the estimated mean.

Answer **(d) (ii)** ..... [4]

(e) What is the probability of randomly picking a learner whose height falls in the class of $173 \leq h < 180$.

Answer **(e)** ..... [1]