Centre Number	Candidate Number	Candidate Name

NAMIBIA SENIOR SECONDARY CERTIFICATE

MATHEMATICS ORDINARY LEVEL

6131/2

PAPER 2

3 hours

Marks 120

2022

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.

For Examiner's Use	
Marker	
Checker	

This document consists of **17** printed pages and **3** blank pages.

Republic of Namibia

MINISTRY OF EDUCATION, ARTS AND CULTURE

For Examiner's Use

1 A bag contains 15 beads.
Each bead is labelled with a different number from 1 to 15. A bead is chosen from the bag at random.

Write down the probability that the chosen bead is

(a) a square number,

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

(b) a prime number,

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

(c) a number divisible by 3,

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

(d) a number less than 9,

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

(e) a cube number,

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

(f) a number that when doubled gives an even number which is also a multiple of 5.

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

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2 Anna travelled from Mariental to Oshikuku. For the first 3 hours, she travelled at 120 km/h, and for the next 6 hours she travelled at 110 km/h.

Assuming she did not stop on the way, find

(a) the total distance travelled,

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

(b) her average travelling speed.

Answer **(b)** .....km/h [2]

3 Eric has 11 cards, each with a letter on it.

E	D	U	C	A	T	I	O	N	A	L

(a) He picks a card at random.

Write down the probability that the chosen card is

(i) the letter N,

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

(ii) the letter A,

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

(iii) not letter U,

Answer **(a) (iii) =** ..... [2]

(iv) the letter D or the letter T,

Answer **(a) (iv) =** ..... [2]

(b) He picks two cards at random, without replacement.
Find the probability that they are both letter A.

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

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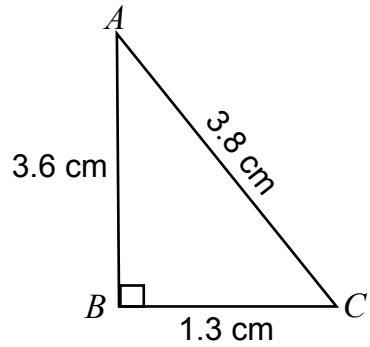
4 The sides of the triangle ABC are all given correct to 1 d.p.



Find the minimum area of triangle ABC.

Answer ..... cm^2 [3]

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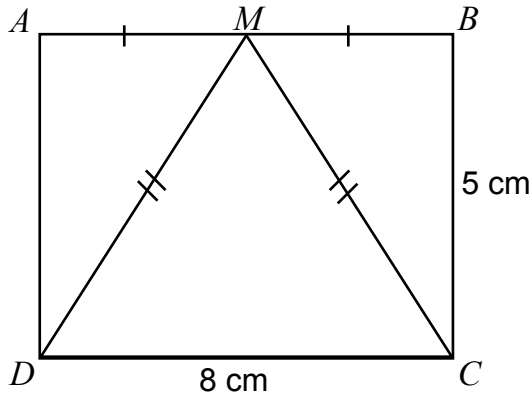
5 $ABCD$ is a rectangle. M is the midpoint of AB.
$MD = MC$. BC = 5 cm and DC = 8 cm.



NOT TO SCALE

(a) Give the special name for triangle MDC.

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

Find

(b) the perimeter of triangle MDC,

Answer **(b)** .....cm [3]

(c) the area of quadrilateral $MBCD$.

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

6 $\mathscr{E}$ = { x: x is a natural number and x < 10}

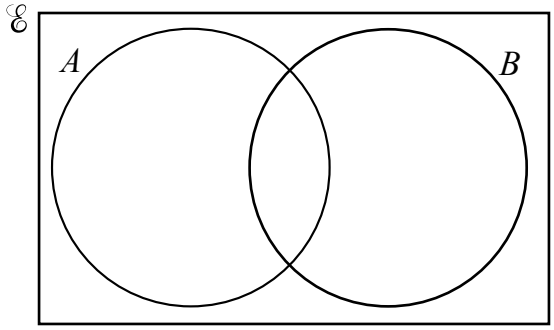
A = {1, 2, 3, 4, 6, 7}

B = {3, 4, 6, 8}

(a) List all the elements of the Universal set $\mathscr{E}$.

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

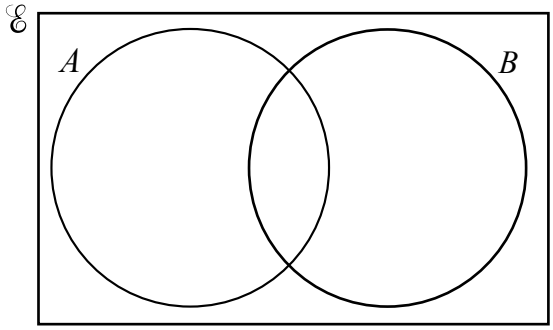
(b) Complete the Venn diagram to represent sets A, B and $\mathscr{E}$.



[3]

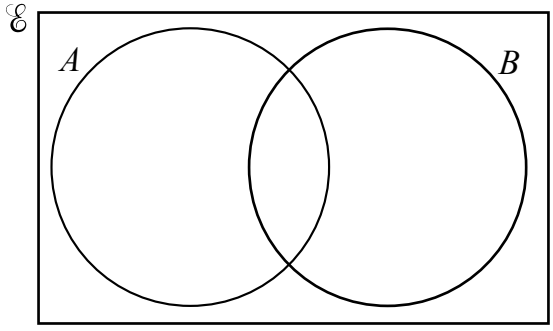
(c) Shade the Venn diagrams to represent the given sets.

(i) $A \cup B$



[1]

(ii) A'



[1]

7 **(a)** Make y the subject of the formula in $t = 2\pi\sqrt{y}$.

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

(b) Simplify

(i) $\frac{2b}{3} \div 4$

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

(ii) $-4m(3m - 2)$,

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

(iii) $\left(\left(x^{\frac{1}{2}} \right)^{\frac{1}{2}} \right)^{-32}$.

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

(c) Solve the equation $\frac{2x}{3} - 8 = 0$.

Answer **(c)** x = ... [2]

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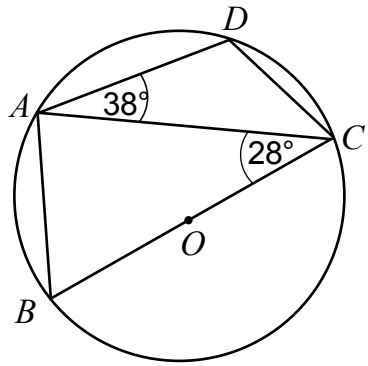
8 Points A, B, and D lies on a circle with centre O. Angle DAC = 38° and angle ACB = 28°.



Find with reasons

(a) angle BAC

Angle BAC = ...°,

Reason ..... [2]

(b) angle ABC

Angle ABC = ...°,

Reason ..... [2]

(c) angle ADC

Angle ADC = ...°,

Reason ..... [2]

For Examiner's Use

9 (a) (i) Factorise $5x^2 - 7x + 2$.

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

(ii) Hence, solve $5x^2 - 7x = -2$.

Answer **(a) (ii)** x = ...or x = ... [2]

(b) Express as a single fraction.

$$\frac{x}{x+2} - \frac{1}{x}$$

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

For Examiner's Use

10 **(a)** Solve simultaneously

$y = x^2$,

$x + y = 12$.

Answer **(a)** x =..... and y = ... or

x =..... and y = ... [4]

(b) Evaluate log1000 + log100, without using a calculator.

Show all your working.

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

(c) Express $1 + 2\log x + \log(x + 1)$ as a single logarithm.

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

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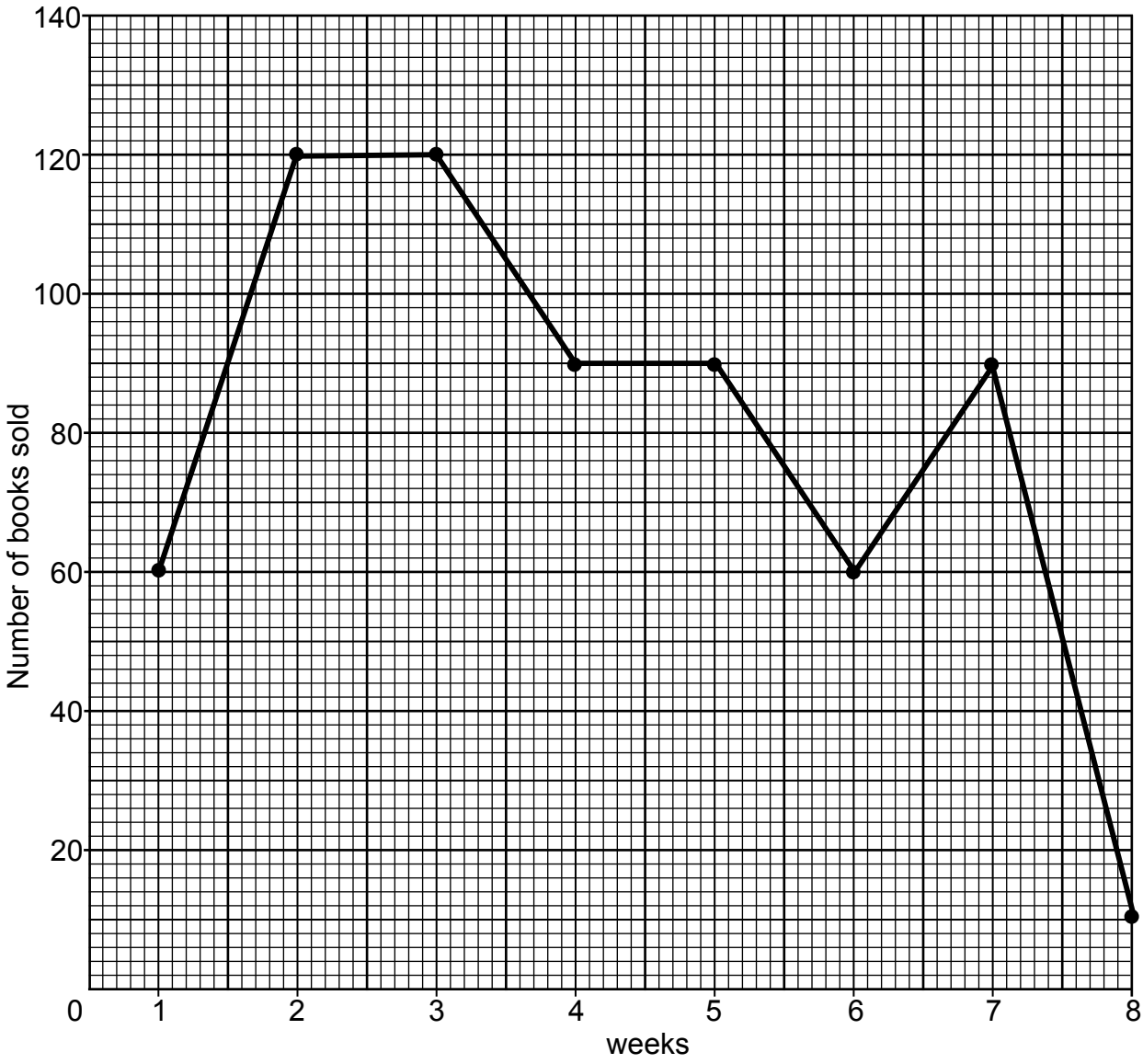
11 The owner of a bookshop drew a graph of the number of books sold each week during a certain period.



(a) Determine the week(s) with

(i) the lowest number of books sold,

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

(ii) no difference in the sales made from one week to the next,

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

(iii) the highest increase in sales.

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

(b) Find the percentage decrease in sales between week 7 and week 8.

Answer **(b)** ..... % [3]

(c) Work out the total number of books sold in the eight weeks.

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

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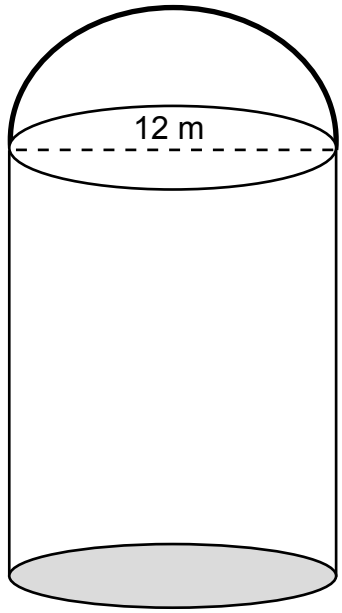
12 A grain silo is a cylinder with a hemisphere on top.
The cylinder has a diameter of 12 m and its height is 13 m.



NOT TO SCALE

[the volume of a sphere = $\frac{4}{3}\pi r^3$]

Find

(a) the height of the silo,

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

(b) the curved surface area of the silo,

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

(c) the volume of the silo.

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

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13 **(a)** Given that $\mathbf{A} = \begin{pmatrix} 2 & -6 \\ 7 & 3 \end{pmatrix}$ and $\mathbf{B} = \begin{pmatrix} 1 & 0 \\ -3 & -4 \end{pmatrix}$.

Find

(i) **AB**

Answer **(a)(i)** $\begin{pmatrix} & \\ & \end{pmatrix}$ [2]

(ii) 2**A** + **B**

Answer **(a)(ii)** $\begin{pmatrix} & \\ & \end{pmatrix}$ [2]

(b) Find x and y if $\begin{pmatrix} x+y & 2 \\ 5+y & -40 \end{pmatrix} = \begin{pmatrix} 6 & 2 \\ 15 & -40 \end{pmatrix}$

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

(c) Use a matrix method, to solve

$x + 2y = 9$

$3x - 5y = 5$

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

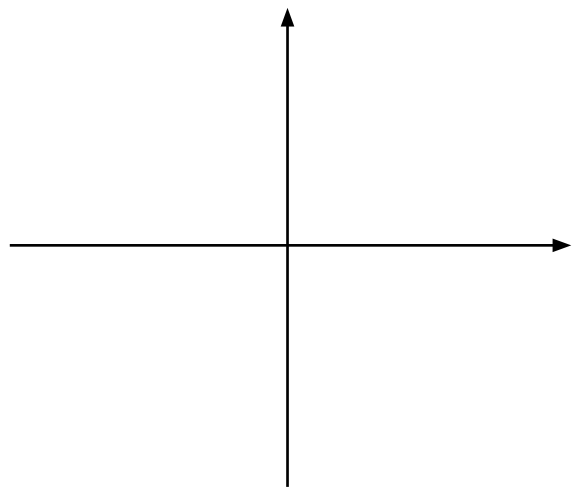
---

14 **(a)** By completing the square, find the coordinates of the turning point of the curve $y = -x^2 - 6x + 7$.

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

(b) Sketch the curve

$y = -x^2 - 6x + 7$.



[4]

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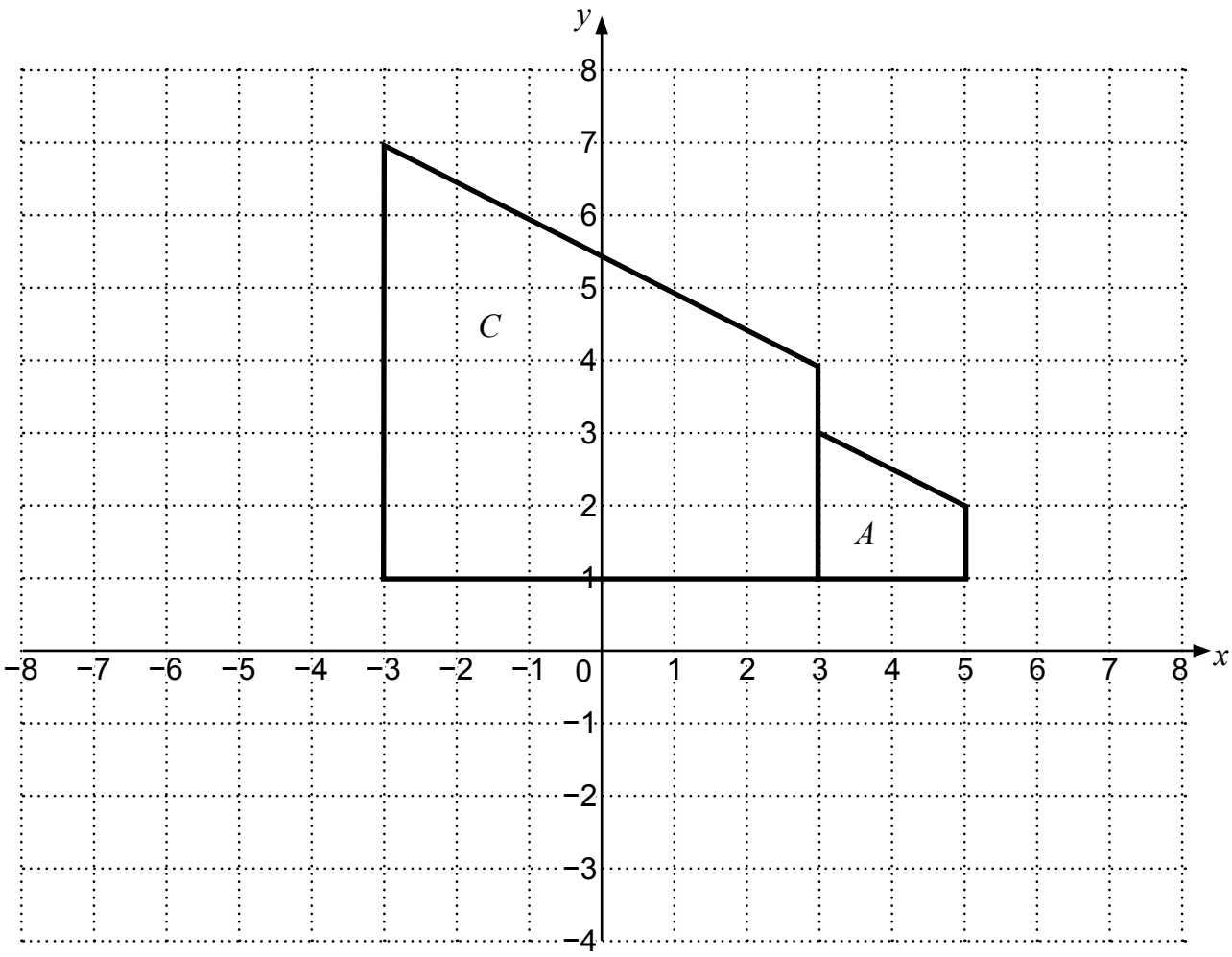
15



(a) On the grid, draw the image of the following transformations of shape A.

(i) Translation by vector $\begin{pmatrix} -9 \\ 4 \end{pmatrix}$. Label the image B. [2]

(ii) Rotation, 90°-clockwise, through centre (5, 1). Label the image D. [2]

(b) Describe fully the single transformation that maps shape A onto shape C.

.....

..... [3]

16 The second, sixth and ninth terms of an AP, are the first three terms of a GP.

Find the common ratio of the GP.

Answer ..... [4]

17 A survey was conducted to find the distances travelled by 182 commuters. The table represents the findings.

distance (km)	frequency	frequency density
$0 \le d < 5$	3	
$5 \le d < 10$	9	
$10 \le d < 15$	34	6.8
$15 \le d < 30$	89	
$30 \le d < 40$	31	3.1
$40 \le d < 60$	16	

(a) Complete the table for the frequency density. [2]

(b) Find the modal class.

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

(c) Calculate an estimated mean of the distance.

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

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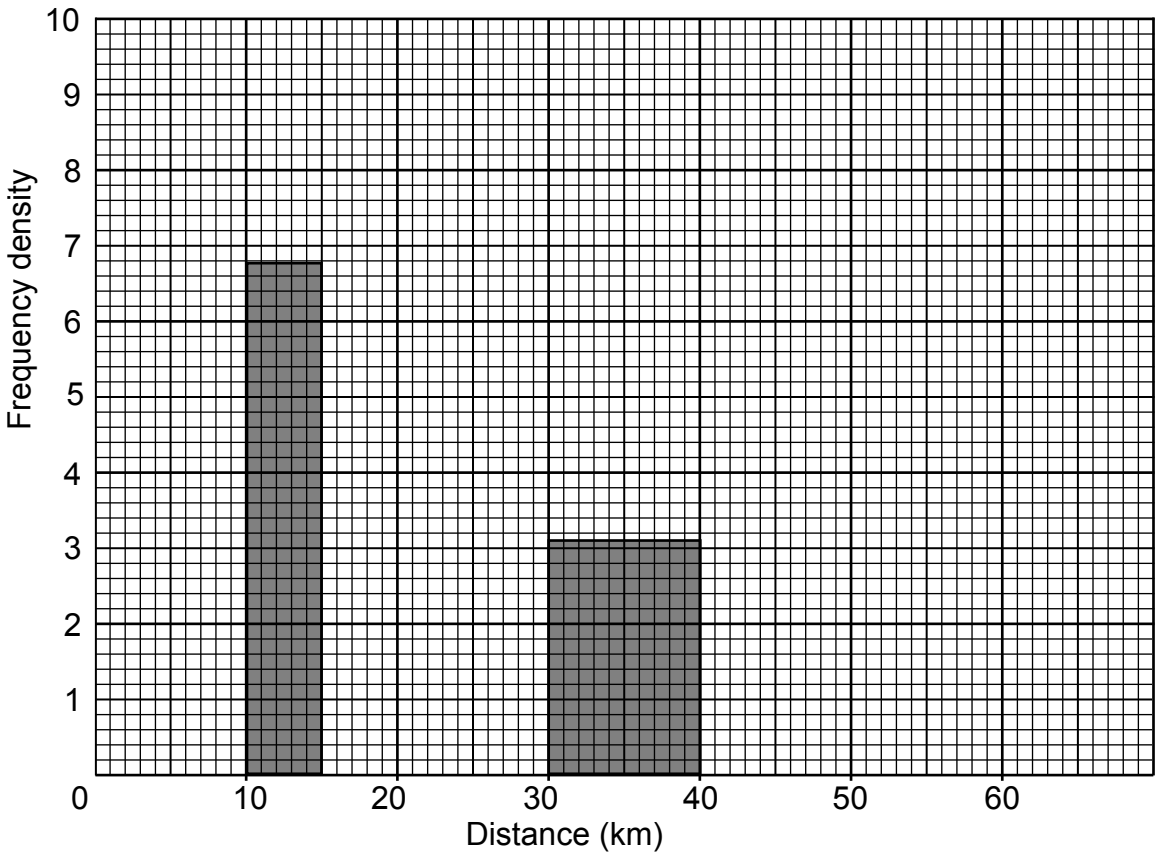
(d) On the grid below, draw a histogram to represent the information in the table.

Two bars have been drawn.



[4]

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