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Preface

Mathematics is a subject mastered through deliberate practice. To build confidence and achieve precision, students preparing for their Cambridge O level Mathematics syllabus D (4029) must engage with a diverse and rigorous range of exam-style questions. Consistent exposure to these problems is essential for developing the problem-solving speed and critical thinking required on exam day.

With this vision in mind, StudyBites has developed this targeted workbook. It is strategically designed to help learners consolidate their knowledge, bridge gaps in understanding, and thoroughly prepare for the pivotal assessments that shape their academic journey.

We hope this manual serves as an invaluable resource for both students striving for excellence and educators guiding them toward success.

List of Formulas

Area, A , of triangle, base b , height h . $A = \frac{1}{2}bh$

Area, A , of circle of radius r . $A = \pi r^2$

Circumference, C , of circle of radius r . $C = 2\pi r$

Curved surface area, A , of cylinder of radius r , height h . $A = 2\pi rh$

Curved surface area, A , of cone of radius r , sloping edge l . $A = \pi rl$

Surface area, A , of sphere of radius r . $A = 4\pi r^2$

Volume, V , of prism, cross-sectional area A , length l . $V = Al$

Volume, V , of pyramid, base area A , height h . $V = \frac{1}{3}Ah$

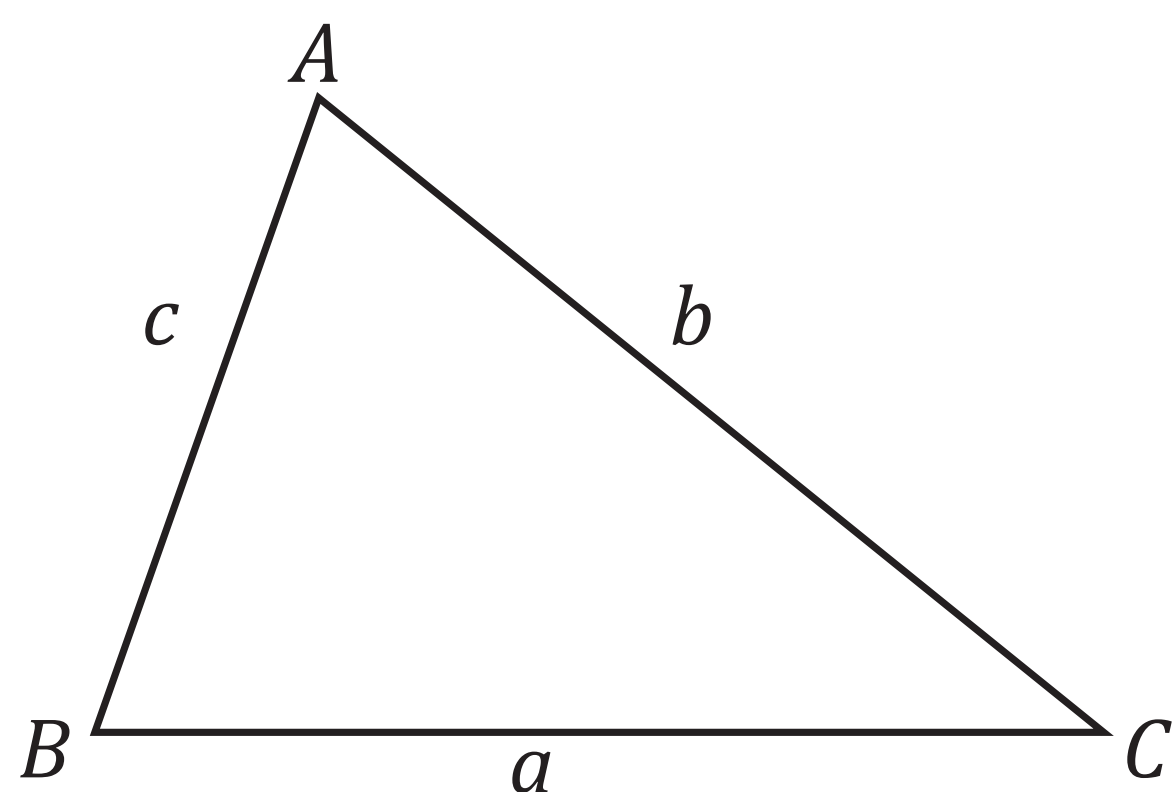
Volume, V , of cylinder of radius r , height h . $V = \pi r^2 h$

Volume, V , of cone of radius r , height h . $V = \frac{1}{3}\pi r^2 h$

Volume, V , of sphere of radius r . $V = \frac{4}{3}\pi r^3$

For the equation $ax^2 + bx + c = 0$, where $a \neq 0$, $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

For the triangle shown,



$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$\text{Area} = \frac{1}{2}ab \sin C$$

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Exam 1 - Paper 1

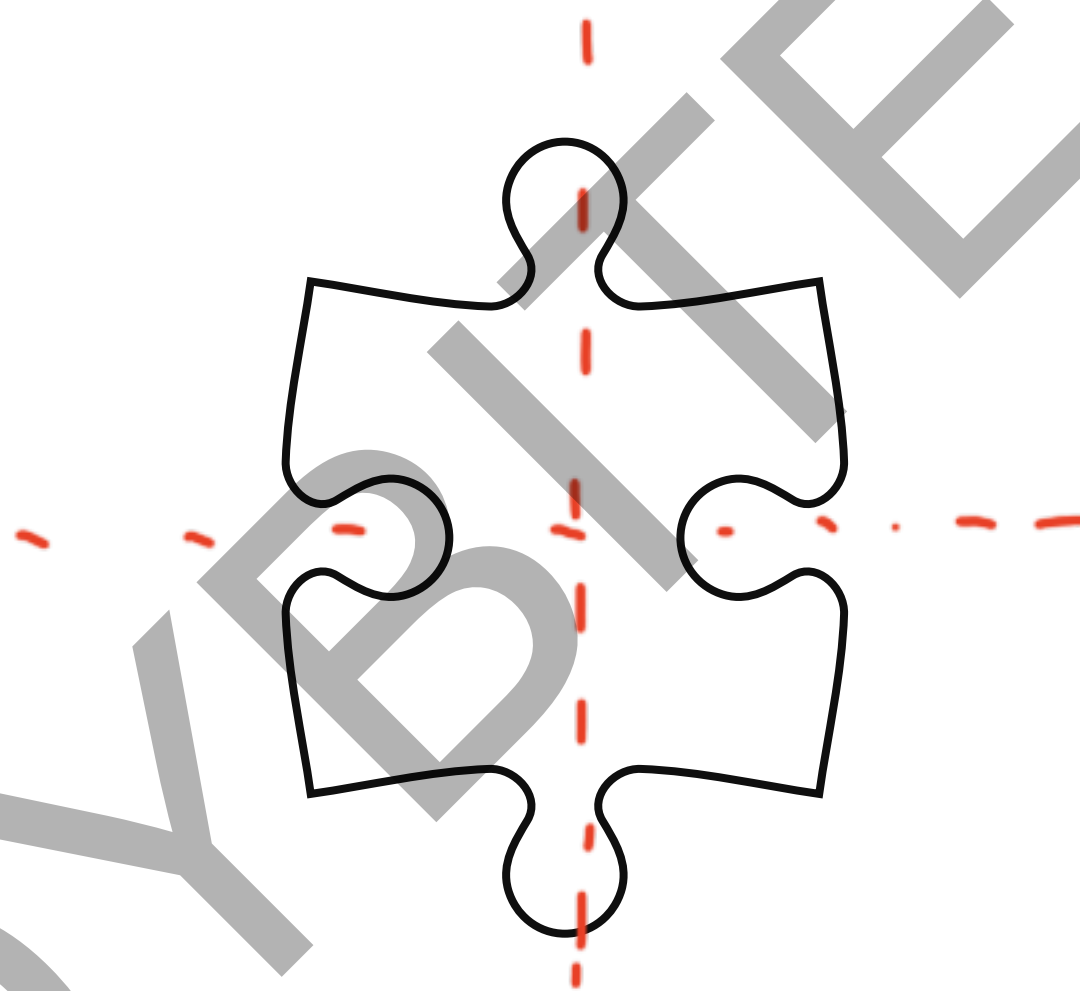
- 1 An angle measures 153° .
Write down the mathematical name for this type of angle.

obtuse..... [1]

- 2 Convert 8.5 m^2 into cm^2 .

85 000..... cm^2 [1]

3



- (a) Write down the order of rotational symmetry for this shape.

2..... [1]

- (b) Draw all the lines of symmetry on this shape.

[2]

4

- 40	- 13	16	21	40	64	71
------	------	----	----	----	----	----

- (a) From this list of numbers, write down:

- (i) A negative integer

- 40..... [1]

- (ii) A square number that is also a cube number

64..... [1]

- (iii) Two numbers with a product of 840.

-40..... and 21..... [1]

- (b) Kiran writes each of the numbers from the list on a card.

- 40	- 13	16	21	40	64	71
------	------	----	----	----	----	----

Kiran picks a card at random and replaces it.

- (i) Find the probability that she picks a number greater than 20.

$$\frac{4}{7}$$

[1]

- (ii) She repeats this process 280 times.

Calculate the expected number of times she picks a number greater than 20.

$$160$$

[1]

- 5 Simplify.

$$b \times 3b - 5b$$

$$3b^2 - 5b$$

[1]

- 6 A gardener tracks the number of roses that bloomed on 4 different bushes.

Here are some statistics:

- Mean: 15
- Mode: 17
- Median: 17
- Range: 10

Find the number of roses on each bush.

$$8$$

$$17$$

$$17$$

$$18$$

[3]

- 7 A stadium has 3 types of seating: standard, premium, or VIP.
The cost of a ticket for each type of seating is shown in the table.

type of seating	cost of a ticket
standard	\$30
premium	\$45
VIP	\$75

- (a) Find the ratio of the cost of a standard : premium : VIP ticket.

Give your answer in its simplest form.

.....².....³ : ⁵..... [2]

- (b) Arshad buys tickets for the stadium on a website.

The website charges a booking fee of 10% of the total cost of the tickets.

Arshad buys 4 tickets for standard seating and 2 tickets for premium seating.

Work out the total amount Arshad pays.

\$ ²³¹..... [3]

- (c) There are 1000 seats in the standard section.

One evening, $\frac{4}{5}$ of the Standard section seats were sold.

The ratio of standard to premium tickets sold was 8 : 3.

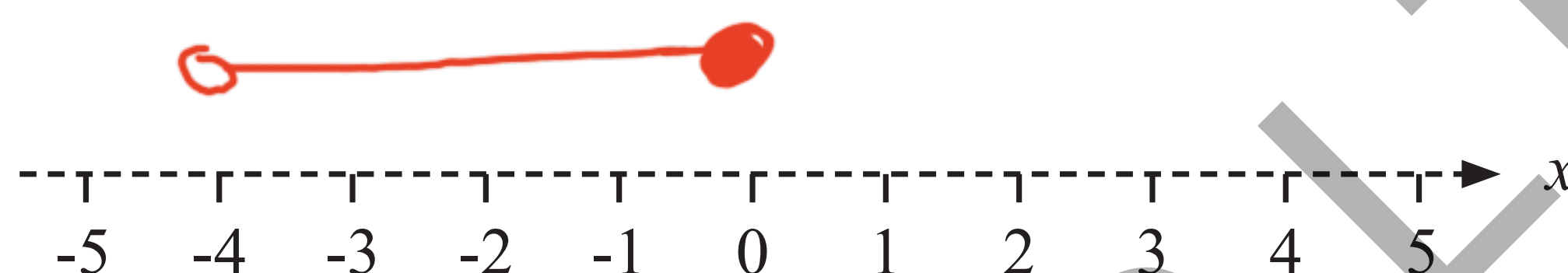
Find the number of tickets sold for premium seating.

.....³⁰⁰..... [3]

- 8 Write the recurring decimal $0.3\dot{5}$ as a fraction.
Give your answer in its simplest form.

$$\frac{16}{45} \dots\dots\dots [3]$$

- 9 Represent the inequality $-4 < x \leq 0$ on the number line.



[2]

- 10 The bearing of P from Q is $(3x + 10)^\circ$.
The bearing of Q from P is 250° .
Find the value of x .

$$x = 20 \dots\dots\dots [3]$$

- 11 (a) Write 563 000 000 in standard form.

$$5.63 \times 10^{28} \dots\dots\dots [1]$$

- (b) Work out $(7.6 \times 10^{28}) - (7.6 \times 10^{27})$.
Give your answer in standard form.

$$6.84 \times 10^{28} \dots\dots\dots [2]$$

- (c) Work out $(40 \times 10^{13})^{\frac{1}{2}}$.
Give your answer in standard form.

2×10^6[2]

- 12 $\xi = \{x : x \text{ is an integer where } 20 < x \leq 35\}$
 $A = \{x : x \text{ is a square number}\}$
 $B = \{x : x \text{ is a multiple of } 4\}$
 $C = \{x : x \text{ is a prime number}\}$

- (a) Use set notation to complete the statement.

$A \cap B = \{ \}$[1]

- (b) Find $n(A \cap B \cap C)$.

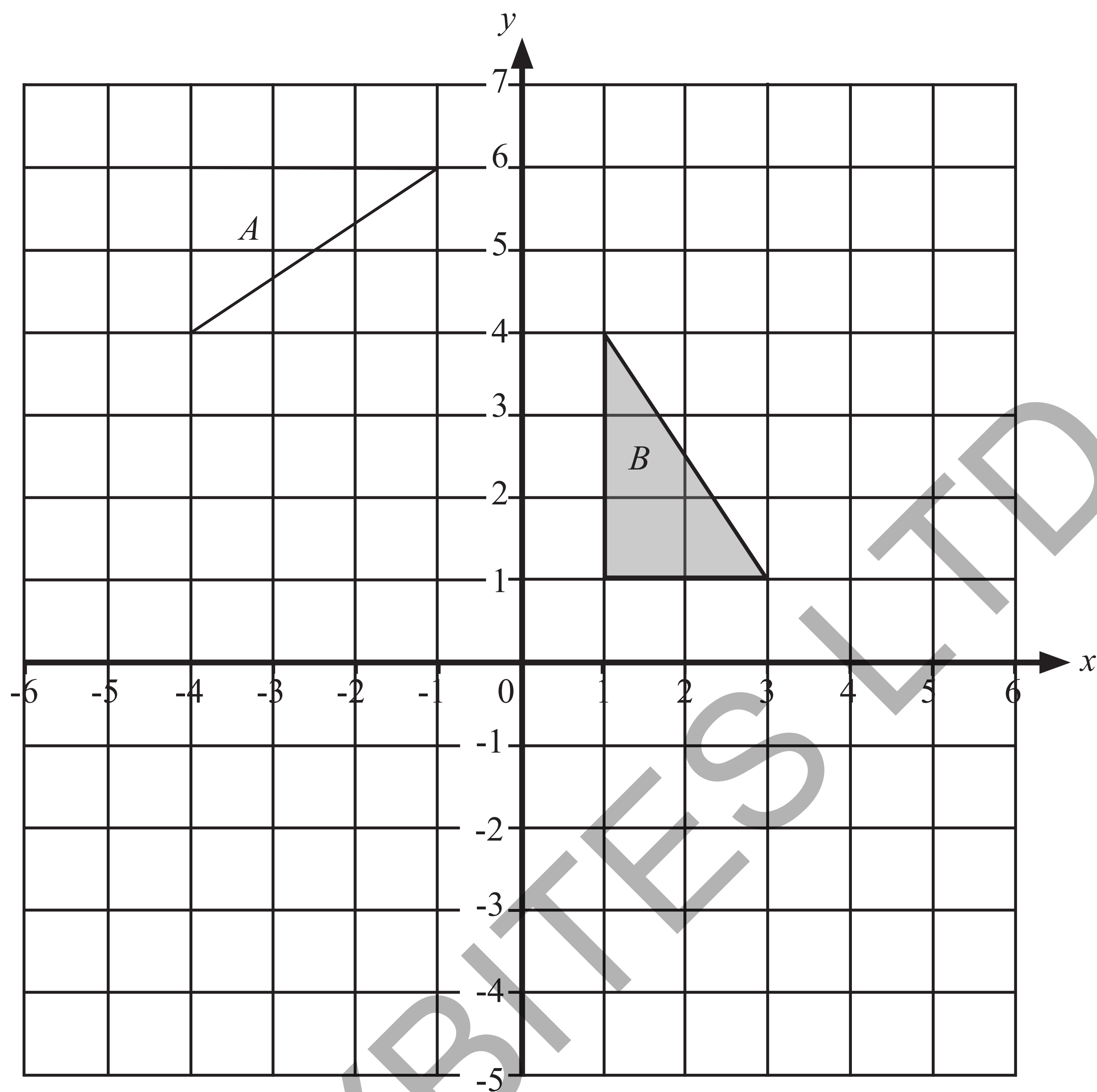
15.....[1]

- 13 Simplify.

$$\sqrt{80} - \sqrt{20}$$

$2\sqrt{5}$[2]

14



(a) On the grid, draw the image of

(i) triangle B after a translation by the vector $\begin{pmatrix} -5 \\ -4 \end{pmatrix}$.

[2]

(ii) triangle B after a reflection in the line $y = x - 2$

[2]

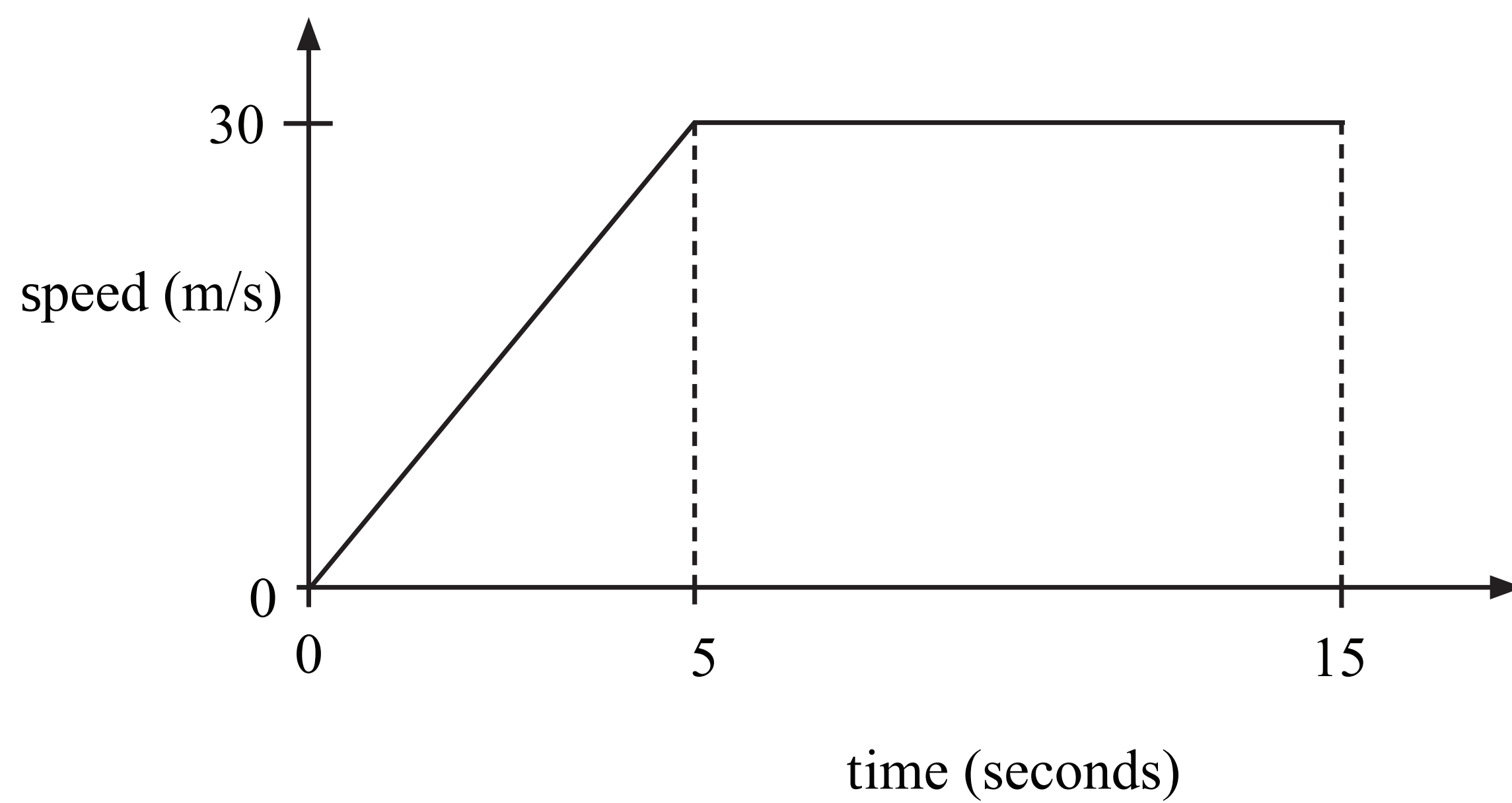
(b) Describe fully the single transformation that maps triangle A onto triangle B .

Rotation, 90° clockwise

Centre $(1, 4)$

[3]

15



NOT TO SCALE

The diagram shows the speed-time graph of the first 15 seconds of a car journey.

(a) Find the acceleration of the car during the first 5 seconds.

..... ⁶ m/s² [1]

(b) Calculate the distance travelled during the 15 seconds.

..... ³⁷⁵ m [2]

16 (a) Simplify.

$$(16x^8)^{-\frac{3}{4}}$$

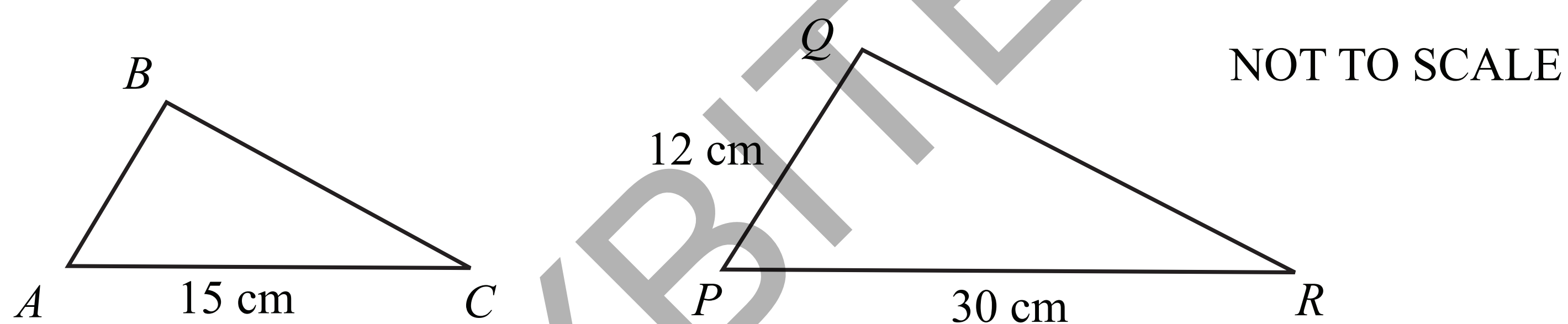
..... $\frac{1}{8x^6}$ [3]

(b) Solve.

$$5^x = 25^{(3-2x)}$$

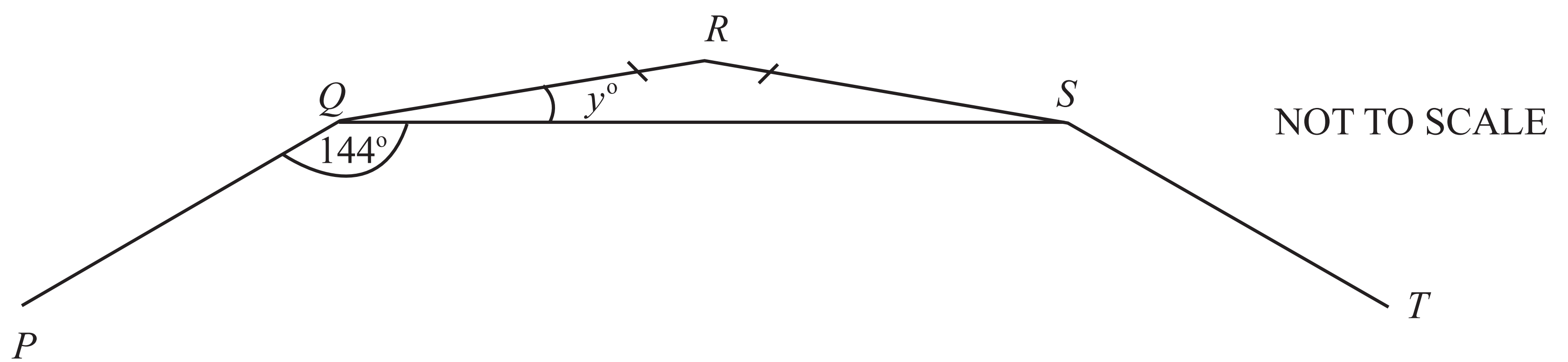
$x = 1\frac{1}{5}$ [3]

17



Triangle ABC is mathematically similar to triangle PQR .
Calculate AB .

6 cm [2]



The diagram shows part of a regular polygon.

Angle $PQS = 144^\circ$ and angle $RQS = y^\circ$.

By finding the value of y , work out the number of sides of this polygon.

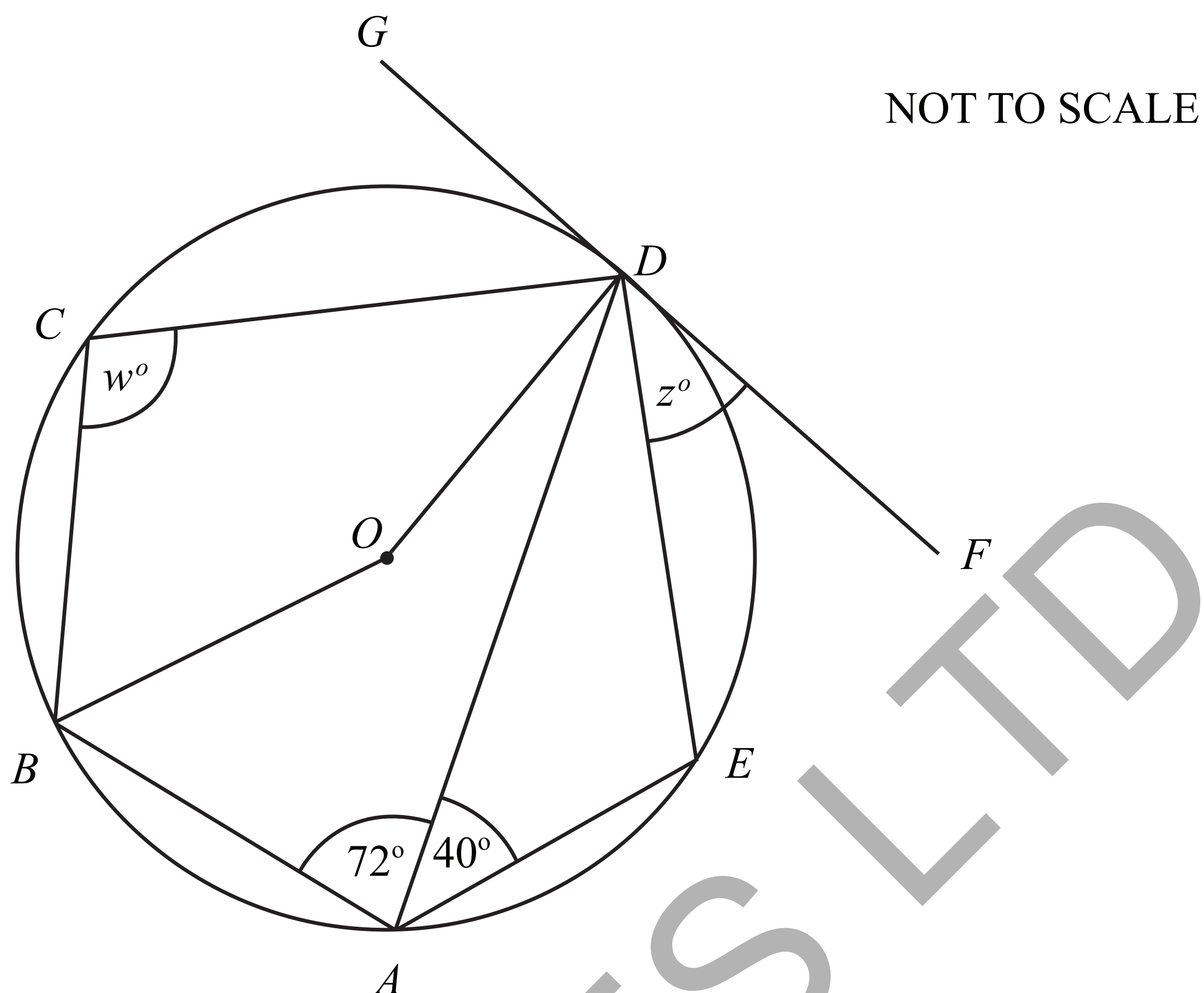
..... 15 [4]

- 19 The first five terms of a quadratic sequence are given.

7, 15, 27, 43, 63, ...

Find an expression, in terms of n , for the n^{th} term of this sequence.

$T_n = 2n^2 + 2n + 3$ [3]



A, B, C, D and E lie on a circle, centre O .
 FG is a tangent to the circle at D .

Angle $EAD = 40^\circ$ and angle $BAD = 72^\circ$.

- (a) Find the value of w and the value of z .

$$w = \dots\dots\dots 108$$

$$z = \dots\dots\dots 40$$

[2]

- (b) Complete this statement with the geometrical reason.

Obtuse angle $BOD = 144^\circ$ because angle at centre is twice
angle at circumference. $\angle BOD = 2 \times \angle BAD$

[1]

- (c) The radius of the circle is 5 cm.

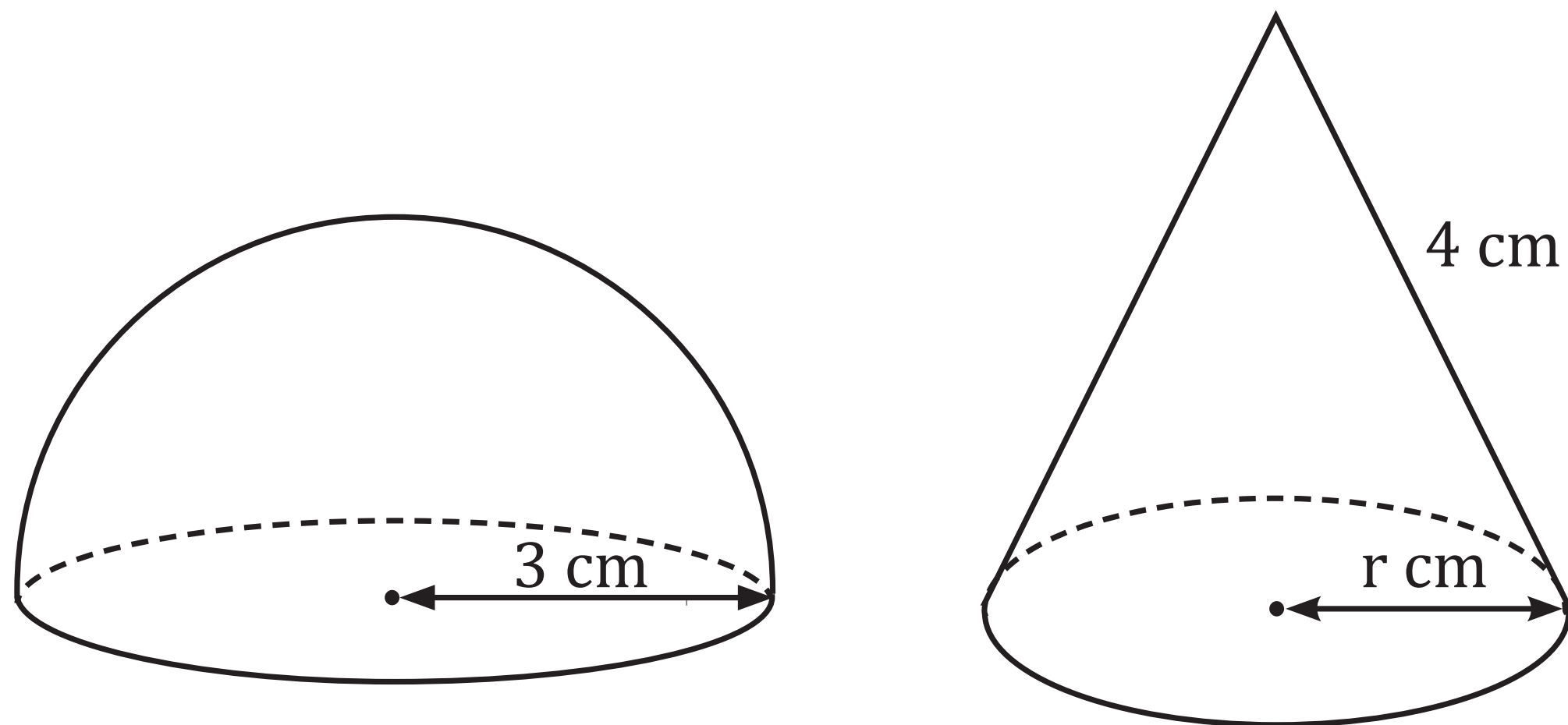
Work out the area of the major sector BOD .

Give your answer in terms of π in its simplest form.

$$\dots\dots\dots 15\pi \dots\dots\dots \text{cm}^2 \text{ [3]}$$

21

NOT TO SCALE



The diagram shows a hemisphere and a cone. The hemisphere has radius 3 cm. The cone has radius r cm and a sloping edge of 4 cm.

The **total** surface area of the hemisphere is equal to the **total** surface area of the cone.

(a) Show that $r^2 + 4r - 27 = 0$.

[3]

(b) Find the exact value of the radius of the cone.
Give your answer as a surd in its simplest form

$$r = \dots -2 + \sqrt{31} \dots [4]$$

22 Point P has coordinates $(-2, 1)$ and point Q has coordinates $(4, 4)$.

(a) Find the vector $\vec{QP}$.

$$\vec{QP} = \begin{pmatrix} -6 \\ -3 \end{pmatrix} [2]$$

(b) Point R has coordinates $(x, 6)$ and the length $QR = 2\sqrt{2}$.
Find the two possible values of x .

$$x = \dots\dots\dots 2 \dots\dots\dots \text{ or } x = \dots\dots\dots 6 \dots\dots\dots [4]$$

(c) Point S lies on the line segment PQ such that $PS : SQ = 2 : 1$.
Find the equation of the line perpendicular to PQ that passes through point S .
Give your answer in the form $y = mx + c$.

$$y = \dots\dots\dots -2x + 7 \dots\dots\dots [5]$$

23 Simplify.

$$\frac{3x^2 - 10x + 8}{ax - 2a + 2bx - 4b}$$

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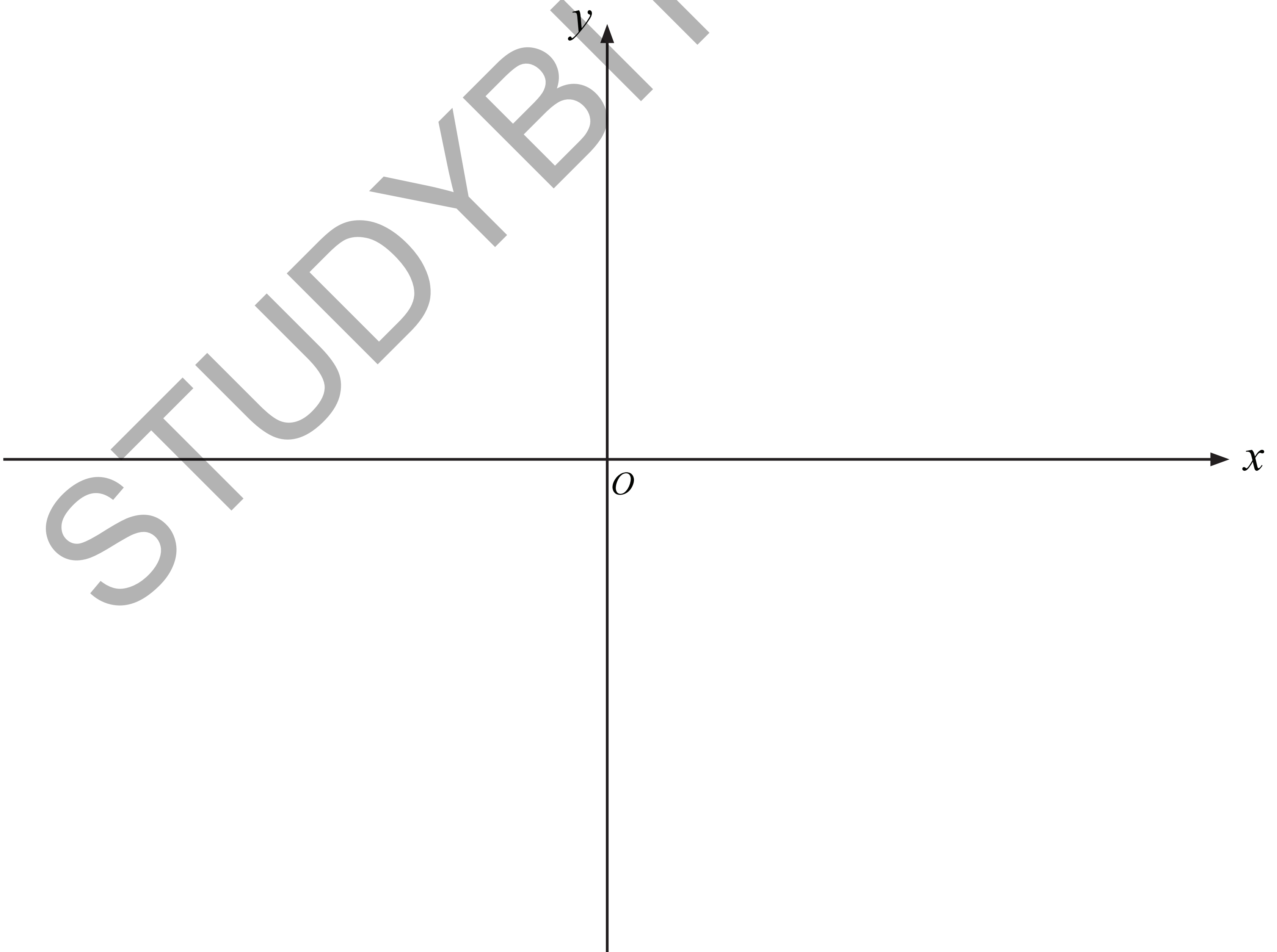
$$\frac{3x-4}{a+2b}$$

[5]

24 (a) Expand and simplify $(x + 1)(x - 4)^2$.

$$x^3 - 7x^2 + 8x + 16 \dots\dots\dots [3]$$

(b) On the diagram, sketch the graph of $y = (x+1)(x-4)^2$, indicating the values where the graph crosses the axes.



[4]

Exam 2 - Paper 1

- 1 Calculate the number of months in 6 years.

.....72..... [1]

- 2 (a) Write down the reciprocal of 0.5.

.....2..... [1]

- (b) Write 0.7 as a fraction.

..... $\frac{7}{10}$ [1]

- (c) Write 35% as a decimal.

.....0.35..... [1]

- (d) Write 4876 correct to the nearest hundred.

.....4900..... [1]

3

$\frac{3}{8}$

0.37

$\frac{7}{20}$

39%

$\frac{7}{20}$

<

0.37

<

$\frac{3}{8}$

<

39%

[2]

Smallest

- 4 A waterproof jacket costs \$80. In a sale, the price is reduced by 15%.
Work out the sale price of the jacket.

\$ 68..... [2]

5

$$E = 5kw^2$$

- (a) Calculate the value of E when $k = 2$ and $w = -2$.

$$E = \underline{40} \dots\dots\dots [1]$$

- (b) Find the positive value of w when $E = 1250$ and $k = 10$.

$$w = \underline{5} \dots\dots\dots [2]$$

6

- (a) Solve the equation.

$$9 - 4x = 2 - 5x$$

$$x = \underline{-7} \dots\dots\dots [2]$$

- (b) Factorise completely.

$$18x^2 - 36x$$

$$\underline{18x(x-2)} \dots\dots\dots [2]$$

- 7 The table shows the favorite primary activities of 120 tourists visiting a nature park.

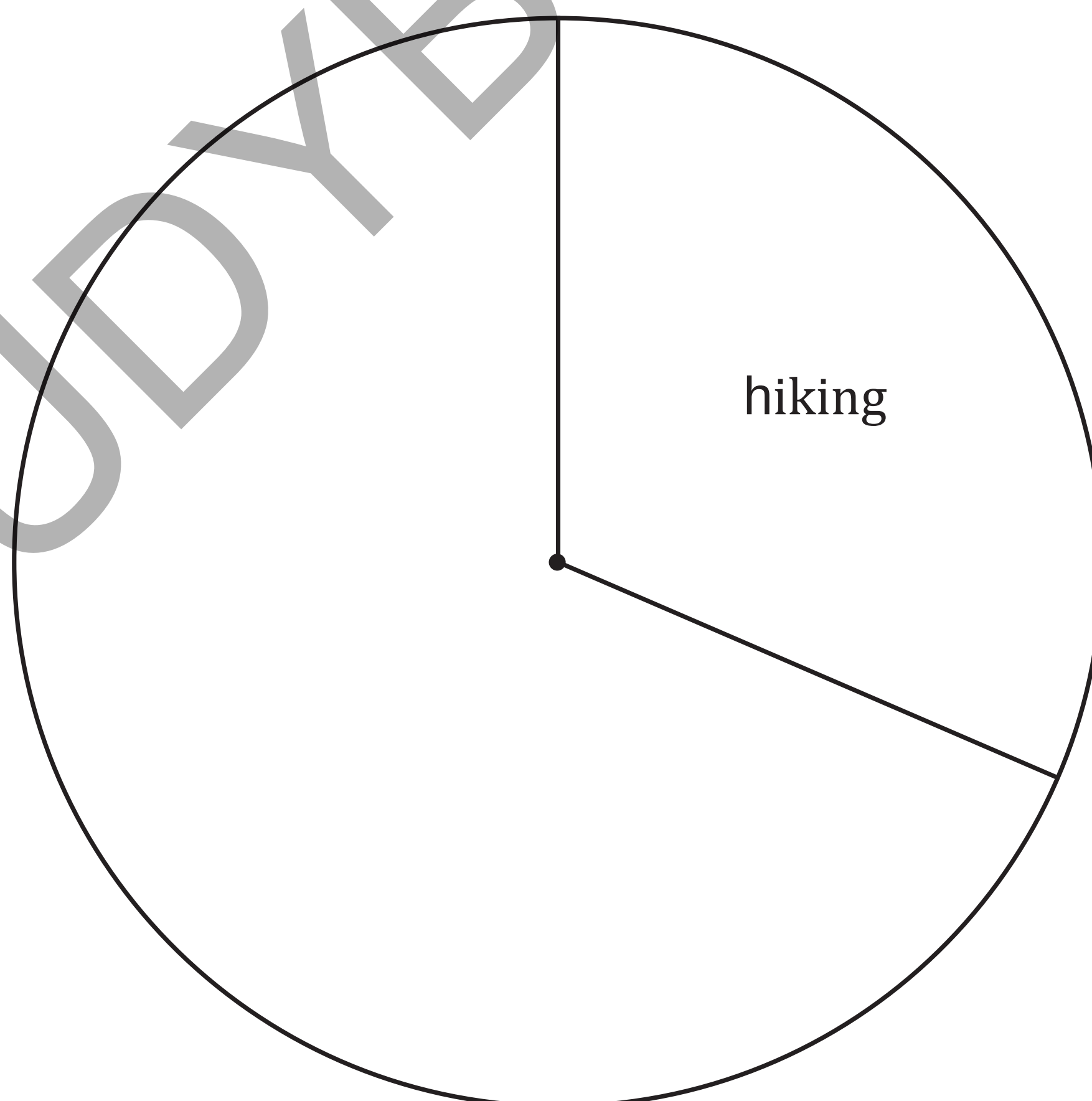
activity	number of tourists	pie chart angle
hiking	40	120°
photography	45	135°
scuba diving	25	75°
cycling	10	30°

- (a) Complete the table.

[2]

- (b) Complete the pie chart to show the information in the table.

[2]



- 8 A student has a mobile phone plan. The charges are shown in the box below.

<u>monthly plan</u>
\$40 Fixed charge per month
plus
\$0.30 for every minute of international calls

The student has the plan for 10 months. The total cost for the 10 months is \$670.
Work out the total number of minutes of international calls the student made.

..... 900 minutes [3]

- 9 Work out.

$$3\frac{3}{4} \div \frac{9}{16}$$

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

..... $6\frac{2}{3}$ [3]

10 Solve the simultaneous equations.

$$3x + 2y = 19$$

$$2x - 3y = 4$$

$$x = \dots\dots\dots 5$$

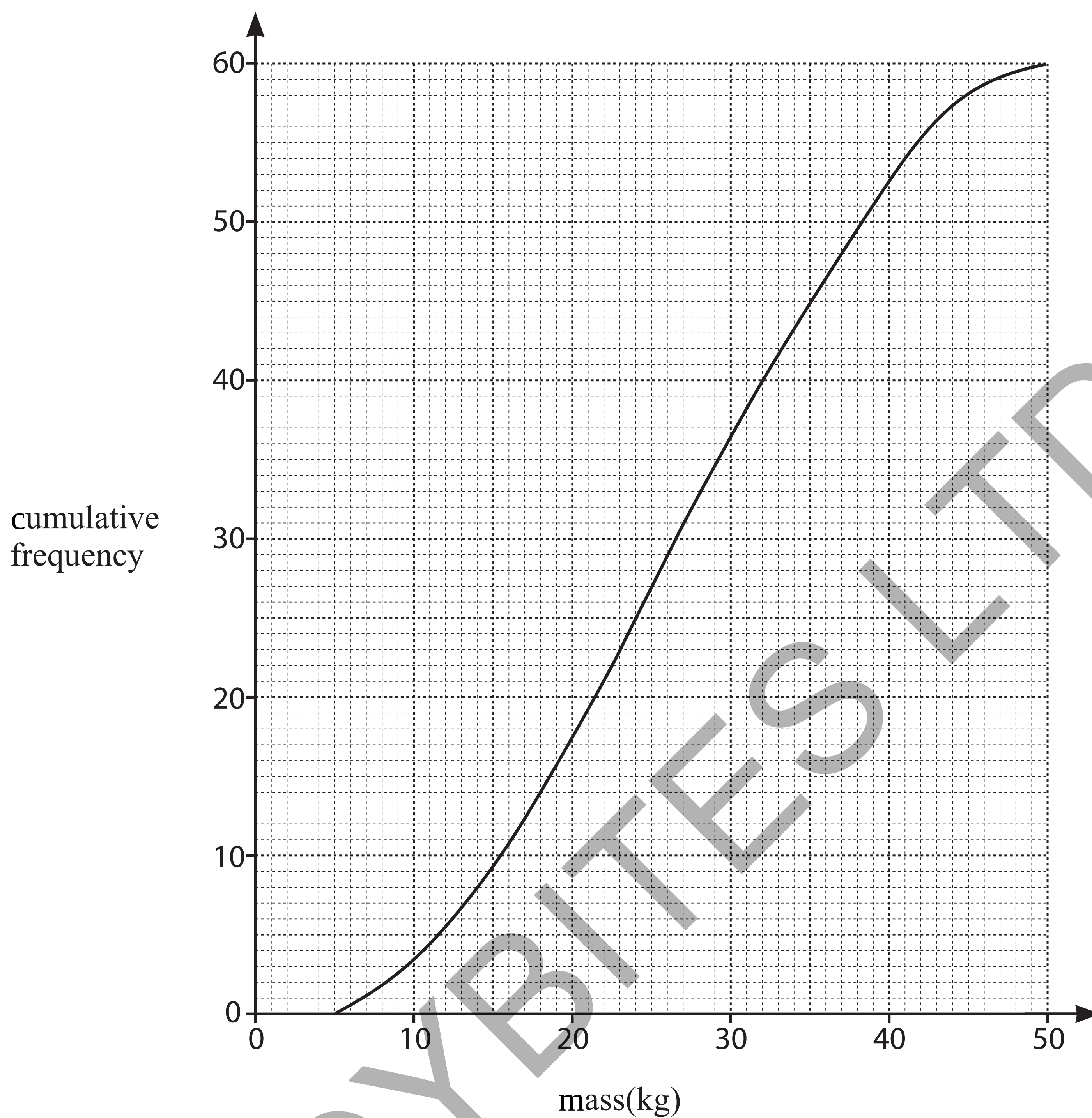
$$y = \dots\dots\dots 2$$

[4]

11 Find the lowest common multiple (L.C.M) of $12ab^3$ and $20a^3b$.

$$\dots\dots\dots 60a^3b^3 \dots\dots\dots [2]$$

- 12 The cumulative frequency diagram shows the mass, in kg, of 60 animals on a farm.



Use the cumulative frequency diagram to find an estimate for

- (a) the median

..... 26 kg [1]

- (b) the number of animals with a mass of more than 35 kg.

..... 14 [2]

13 y is directly proportional to the square root of $(x+5)$.

Given that $y = 12$ when $x = 4$,

(a) Find an equation connecting y and x .

$$y = 14\sqrt{x+5} \dots [2]$$

(b) Find the value of y when $x = 31$.

$$y = 24 \dots [2]$$

14 Simplify.

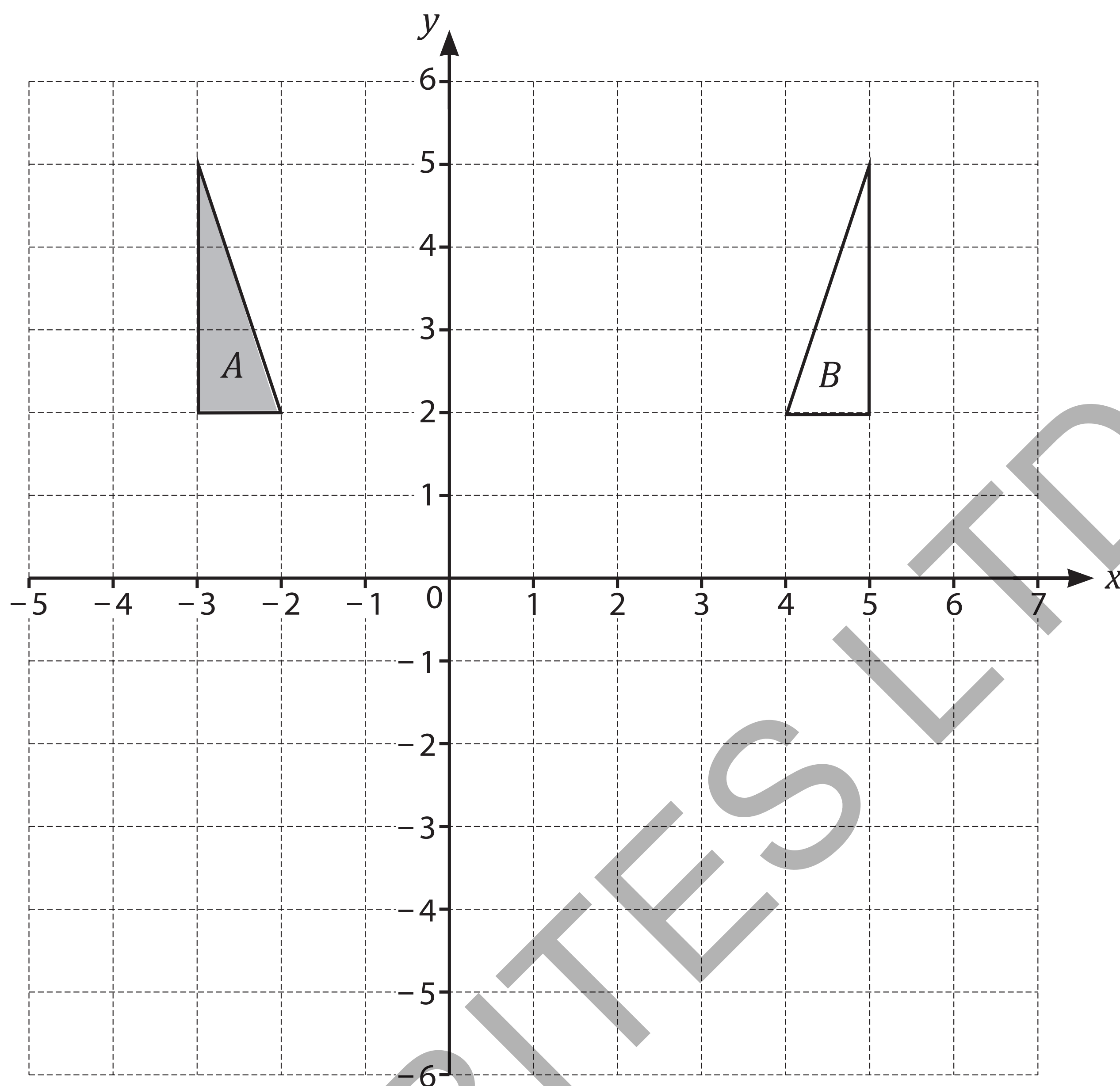
(a) $28x^{-3} \div 7x^{-5}$

$$4x^2 \dots [2]$$

(b) $(64a^{12})^{\frac{2}{3}}$

$$16a^8 \dots [2]$$

- 15 The diagram shows triangle A and triangle B.



- (a) Describe fully the single transformation that maps triangle A onto triangle B.

Reflection in the line $x=1$

[2]

- (b) Draw the image of triangle A after a rotation of 180° about centre $(0, 0)$.

[2]

16 $f(x) = 4 - 7x$

- (a) When the domain of f is $\{0, 1, 3\}$, find the range of f .

$\{4, -3, -17\}$ [2]

(b) Find $f(-2)$.

.....18..... [1]

(c) Find $f(2 - 3x)$.

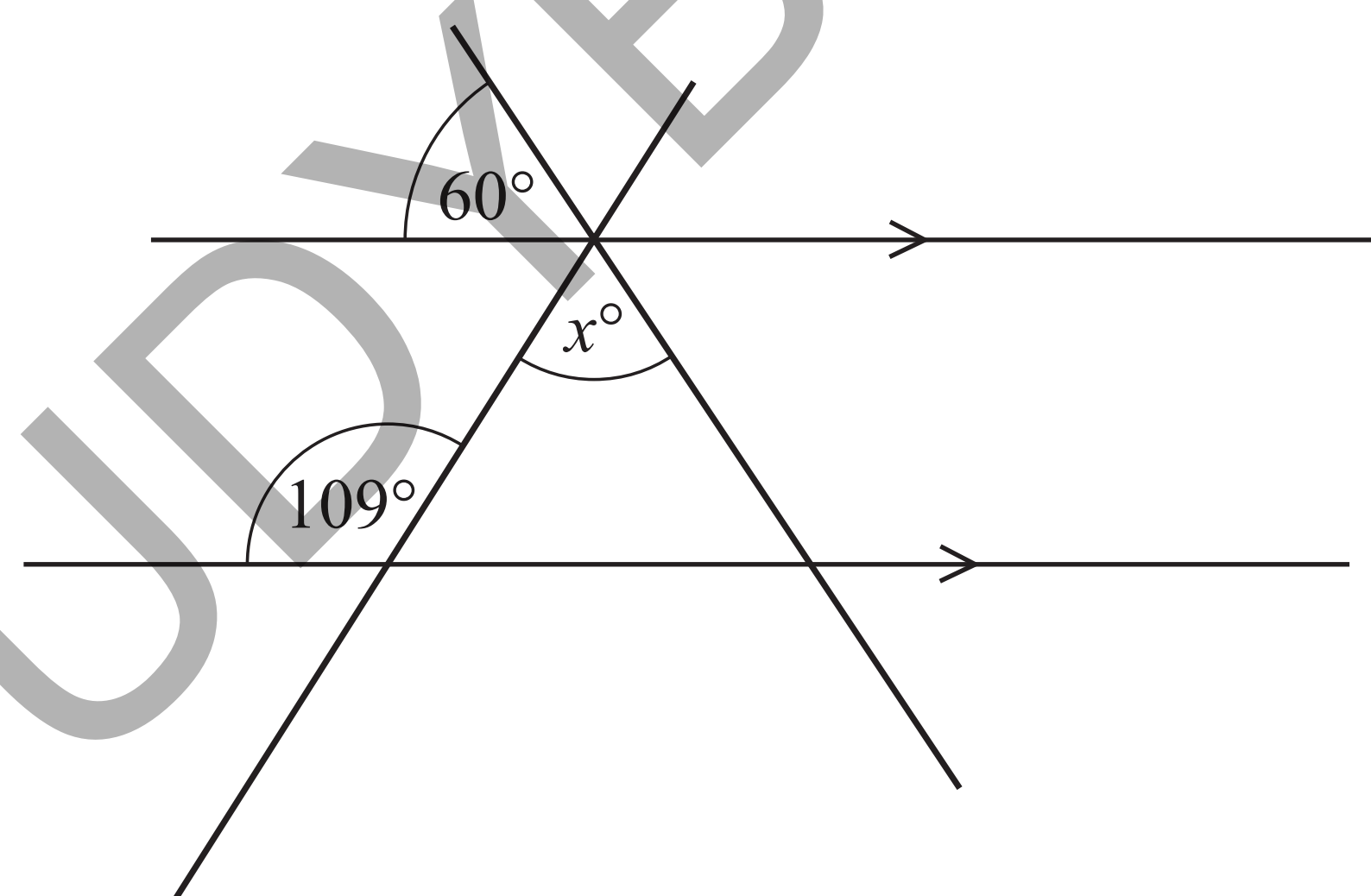
Give your answer in its simplest form.

..... $21x - 10$ [2]

(d) Find $f^{-1}(x)$.

$f^{-1}(x) = \dots\dots\dots \frac{4-x}{7} \dots\dots\dots$ [2]

17



NOT TO
SCALE

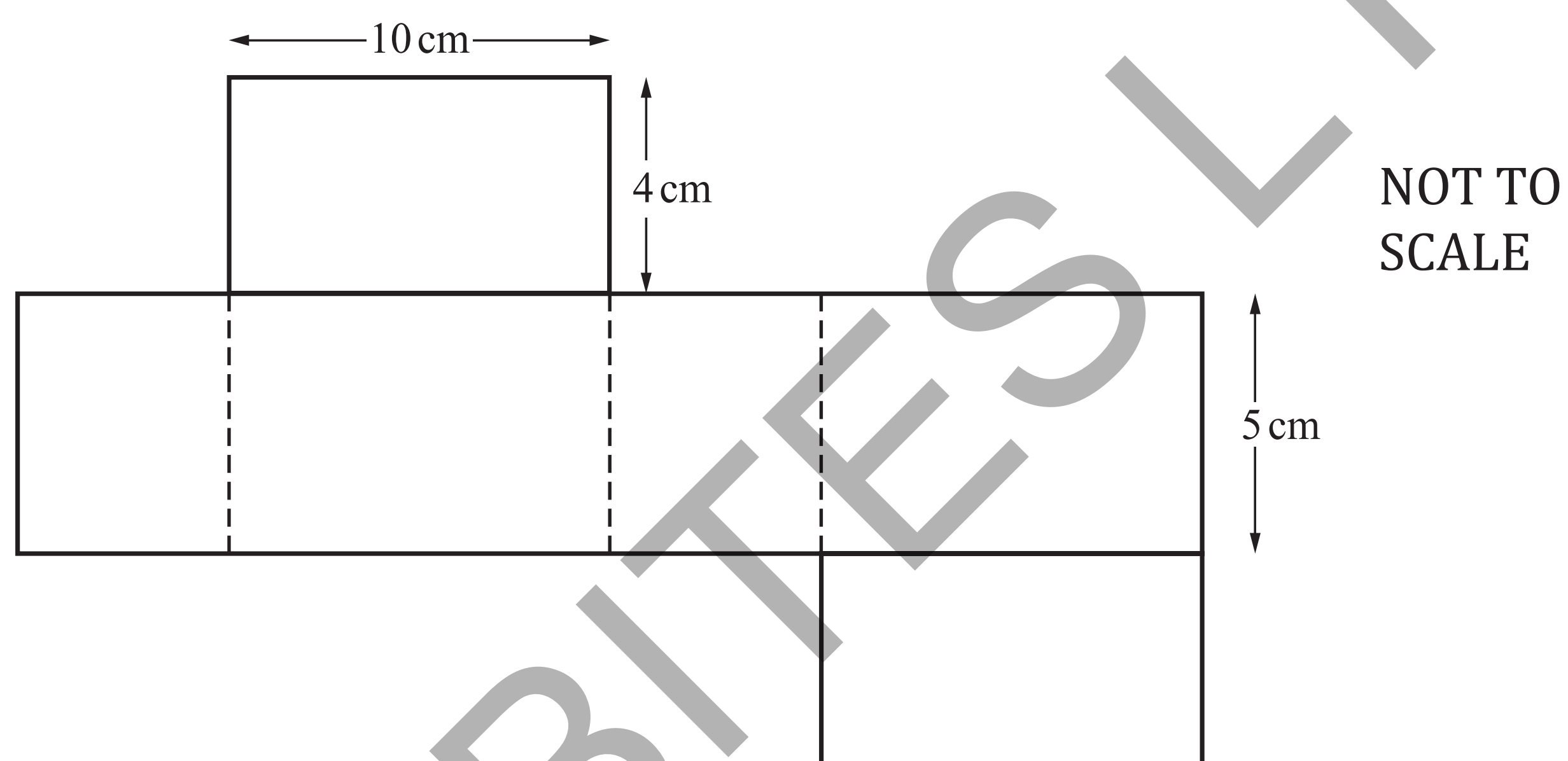
The diagram shows two intersecting straight lines crossing two parallel lines.
Find the value of x .

$x = \dots\dots\dots 49 \dots\dots\dots$ [2]

- 18 By writing each number correct to 1 significant figure, work out an estimate for the value of

$$\frac{\sqrt{104.2} \times 9.3}{32}$$

19



The diagram shows the net of a cuboid.

- (a) Work out the surface area of this cuboid.

..... 220 cm² [2]

- (b) Work out the volume of this cuboid.

..... 200 cm³ [2]

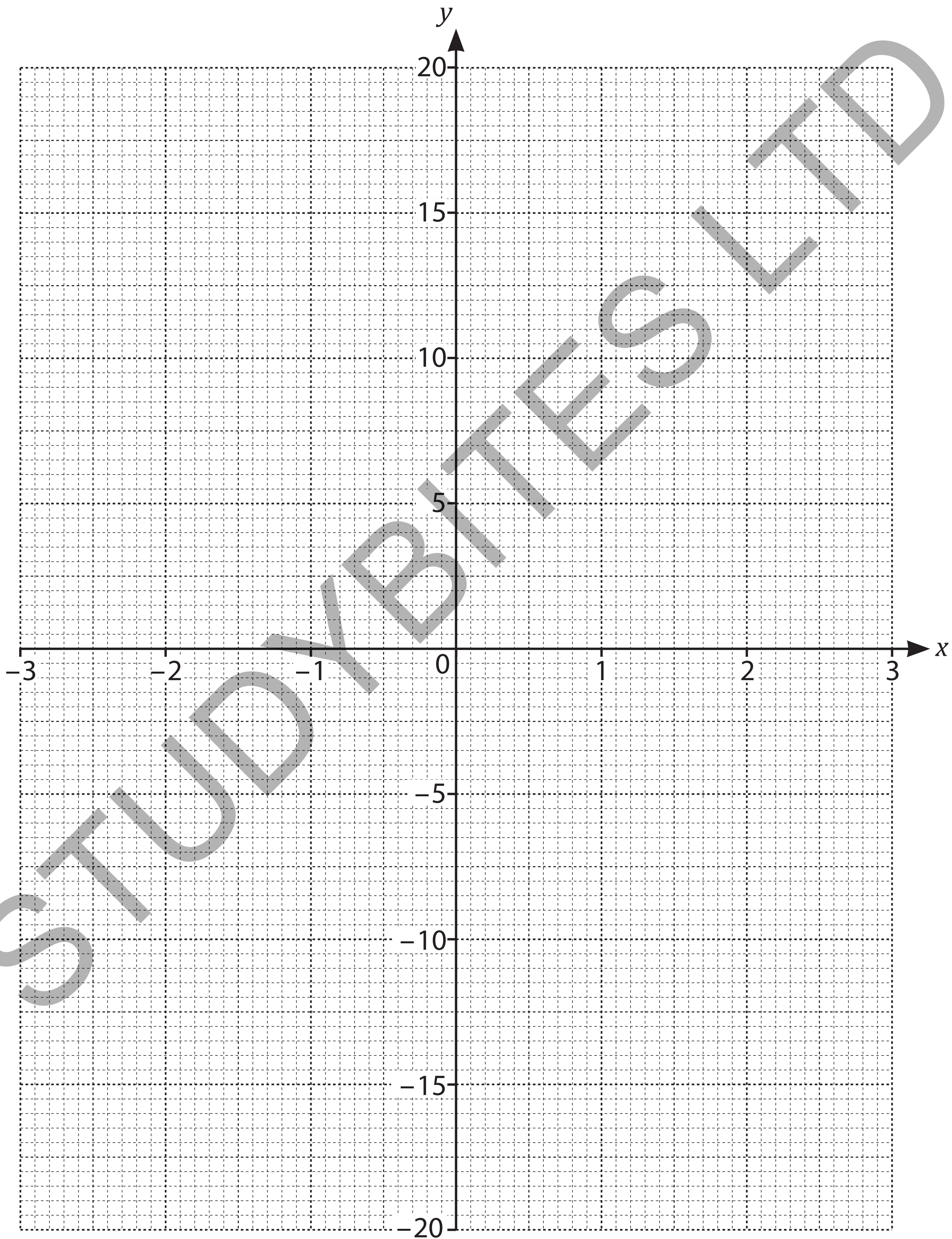
20 The table shows some values for $y = x^3 - 3x + 2$.

x	-3	-2	-1	0	1	2	3
y	-16	0	4	2	0	4	20

(a) Complete the table.

[2]

(b) Draw the graph of $y = x^3 - 3x + 2$ for $-3 \leq x \leq 3$.



[4]

- (c) By drawing a suitable line on the grid, find the solutions of the equation $x^3 = 7x - 1$.

$$y = 4x + 1$$

$$x = -2.7 \text{ or } x = 0.1 \text{ or } x = 2.6 \quad [4]$$

- 21 Kim picks a number at random from the numbers 1, 2 and 3.
She then picks a number at random from the numbers 5, 6 and 7.
She adds the two numbers to find the total.

- (a) Complete the table to show the possible outcomes.

		first number		
second number	+	1	2	3
	5	6	7	8
	6	7	8	9
	7	8	9	10

[1]

- (b) Find the probability that the total of the two numbers is odd and one of the numbers Kim picks is 7.

$$\frac{1}{9} \quad [2]$$

22 One afternoon, Lam cycles 24 km at a speed of x km/h.

The next afternoon, he cycles 32 km at a speed of $(x - 4)$ km/h.

(a) Write down an expression, in terms of x , for the time he spends cycling on the first afternoon.

$$\frac{24}{x} \dots\dots\dots \text{h [1]}$$

(b) Write down an expression, in terms of x , for the time he spends cycling on the second afternoon.

$$\frac{32}{x-4} \dots\dots\dots \text{h [1]}$$

(c) The time Lam spends cycling on the first afternoon is 2 hours less than the time he spends on the second afternoon.

Write an equation in terms of x and show that it simplifies to $x^2 - 8x - 48 = 0$.

$$\frac{32}{x-4} - \frac{24}{x} = 2$$

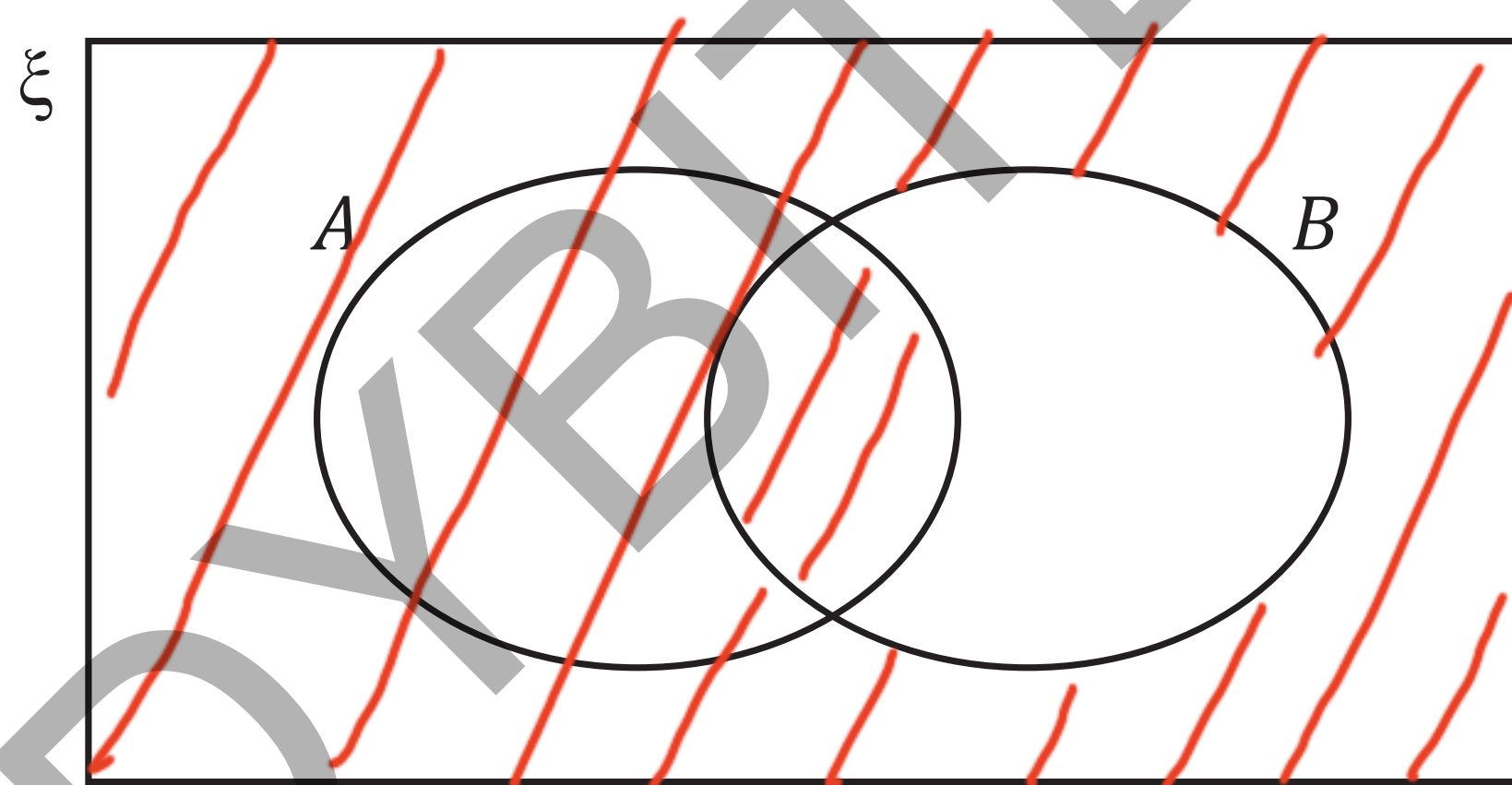
(d) Use factorisation to solve the equation $x^2 - 8x - 48 = 0$.

$$x = -4 \text{ or } x = 12 \quad [3]$$

(e) Find the time Lam spends cycling on the first afternoon.

$$2 \text{ h} \quad [1]$$

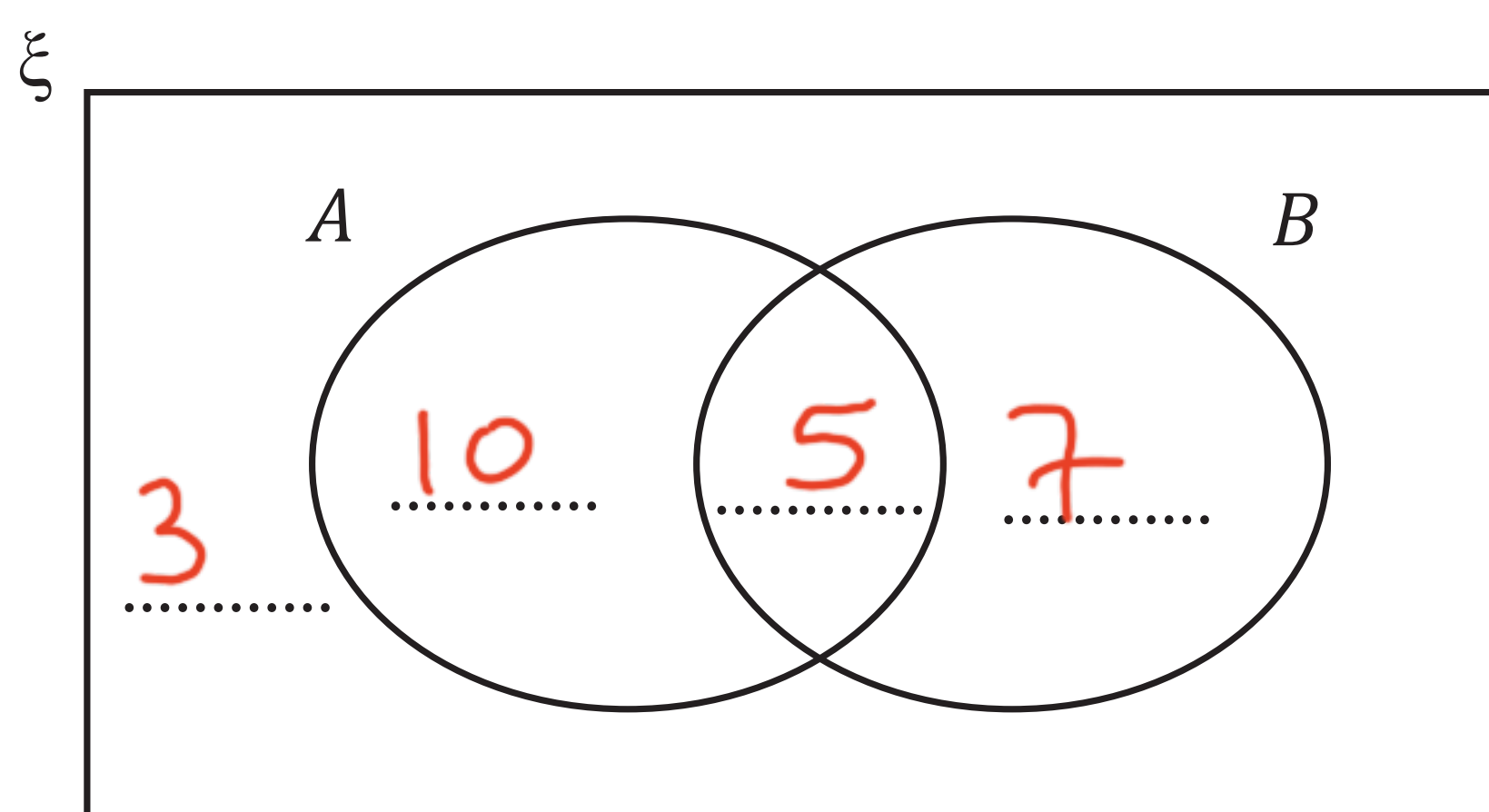
23 (a) On the Venn diagram, shade the region $A \cup B'$.



[1]

(b) $n(\xi) = 25$ $n(A \cup B)' = 3$ $n(A) = 15$ $n(B) = 12$

Complete the Venn diagram.



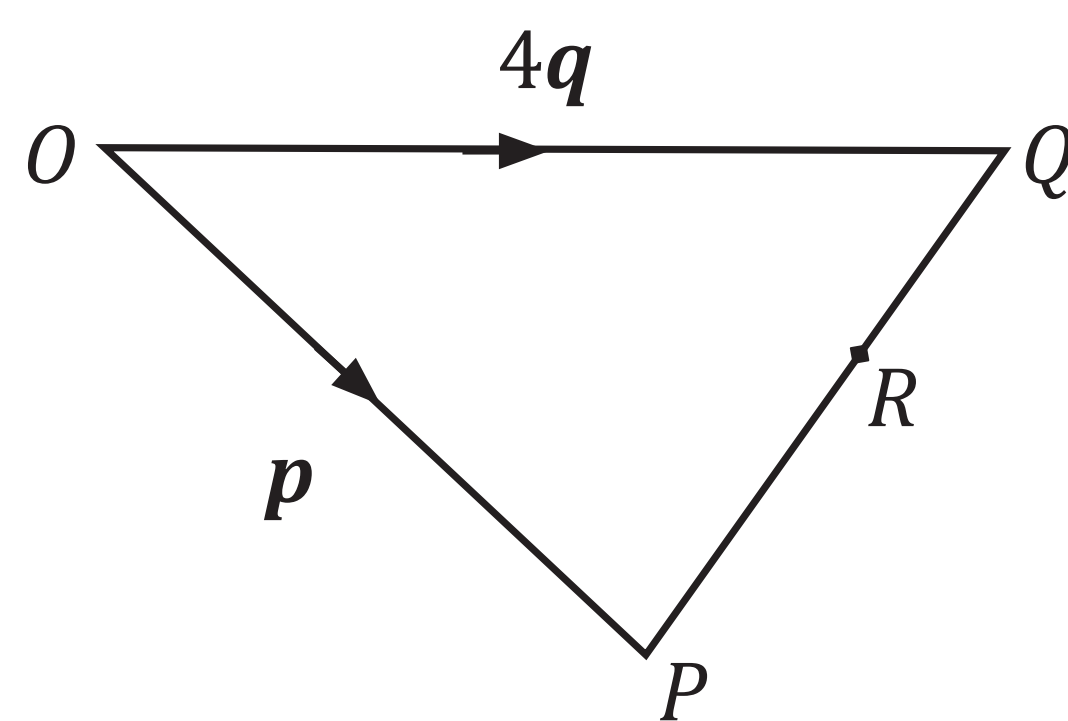
[2]

- 24 $(x + a)(x - 1)(2x + 3)$ is equivalent to $2x^3 + bx^2 + cx - 12$.
Find the value of each of a , b and c .

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$$\begin{aligned} a &= \dots\dots\dots 4 \\ b &= \dots\dots\dots 9 \\ c &= \dots\dots\dots 1 \end{aligned}$$

[4]



NOT TO SCALE

The diagram shows triangle OPQ .
 $\vec{OP} = p$ and $\vec{OQ} = 4q$.

R is a point on PQ such that $PR : RQ = 3:2$.

- (a) Find $\vec{PQ}$ in terms of p and q .

$$\vec{PQ} = \underline{4q - p} \quad [1]$$

- (b) Show that the position vector of R is $\frac{1}{5}(2p + 12q)$.

[3]

- (c) S is a point on OQ and $\vec{SR} = \frac{1}{5}(2p - 3q)$.

Find $OS : SQ$.

$$\underline{3} : \underline{1} \quad [3]$$

Exam 3 - Paper 1

- 1 Write the number thirty thousand three hundred in figures.

..... 30 300 [1]

- 2 Write down the temperature that is 9 °C below -4 °C.

..... -13 °C [1]

- 3 Work out.

(a) 20×0.2

..... 4 [1]

(b) $\frac{3}{8} \div \frac{3}{16}$

..... 2 [1]

- 4 The price of a television is \$450.
In a sale, the price is reduced by 20%.
Work out the sale price of the television.

\$ 360 [2]

5 Write in standard form.

(a) 84 000

8.4×10^4 [1]

(b) 0.00017

1.7×10^{-4} [1]

6 (a) $a^{12} \div a^x = a^4$

Find the value of x .

$x =$ ~~12~~ 8 [1]

(b) Write down the value of 125^0 .

1 [1]

(c) Write 16×64^2 in the form 2^n .

2^{16} [2]

7 The table shows how many books students read over the summer holidays.

number of books	2	3	4	5
frequency	7	8	3	2

Find

(a) the range

3 [1]

(b) the mode

3 [1]

(c) the median

3

..... [1]

(d) the mean.

3

..... [3]

- 8 At a bus terminal in Port Louis, two different shuttle buses depart at 08 30.
 Shuttle A leaves every 15 minutes.
 Shuttle B leaves every 24 minutes.
 At what time will both shuttles next depart from the terminal together?

10 30

..... [3]

- 9 Kevin has a bag of fruit-flavoured sweets.
 He picks one sweet at random.
 The probability that he selects a strawberry sweet is 0.7.

(a) Work out the probability that Kevin does not pick a strawberry sweet.

0.3

..... [1]

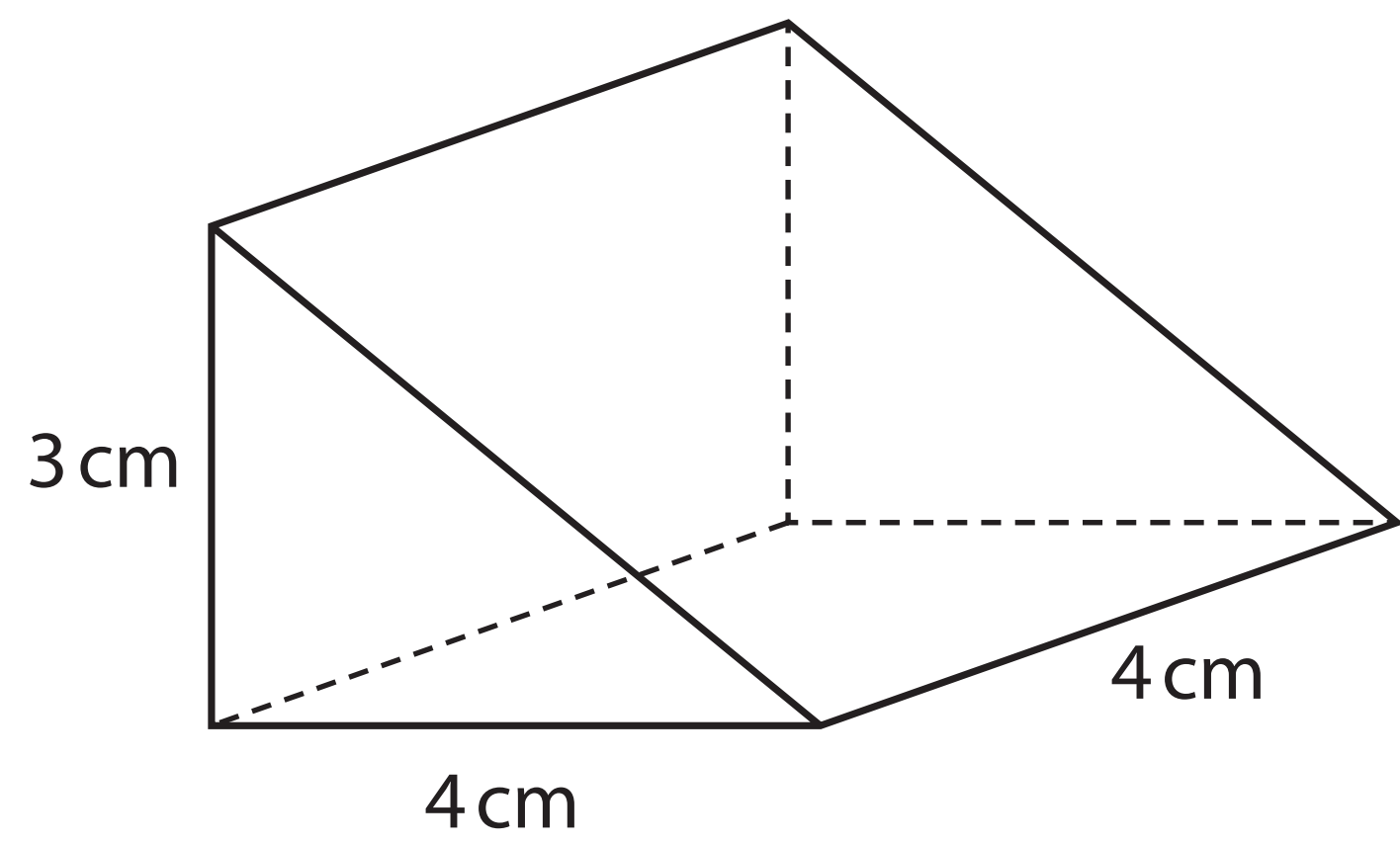
(b) The bag contains three flavours of sweets: strawberry, lime and orange.

flavours of sweets	strawberry	lime	orange
number of sweets	28	6	6
probability	0.7	0.15	0.15

Complete the table.

[2]

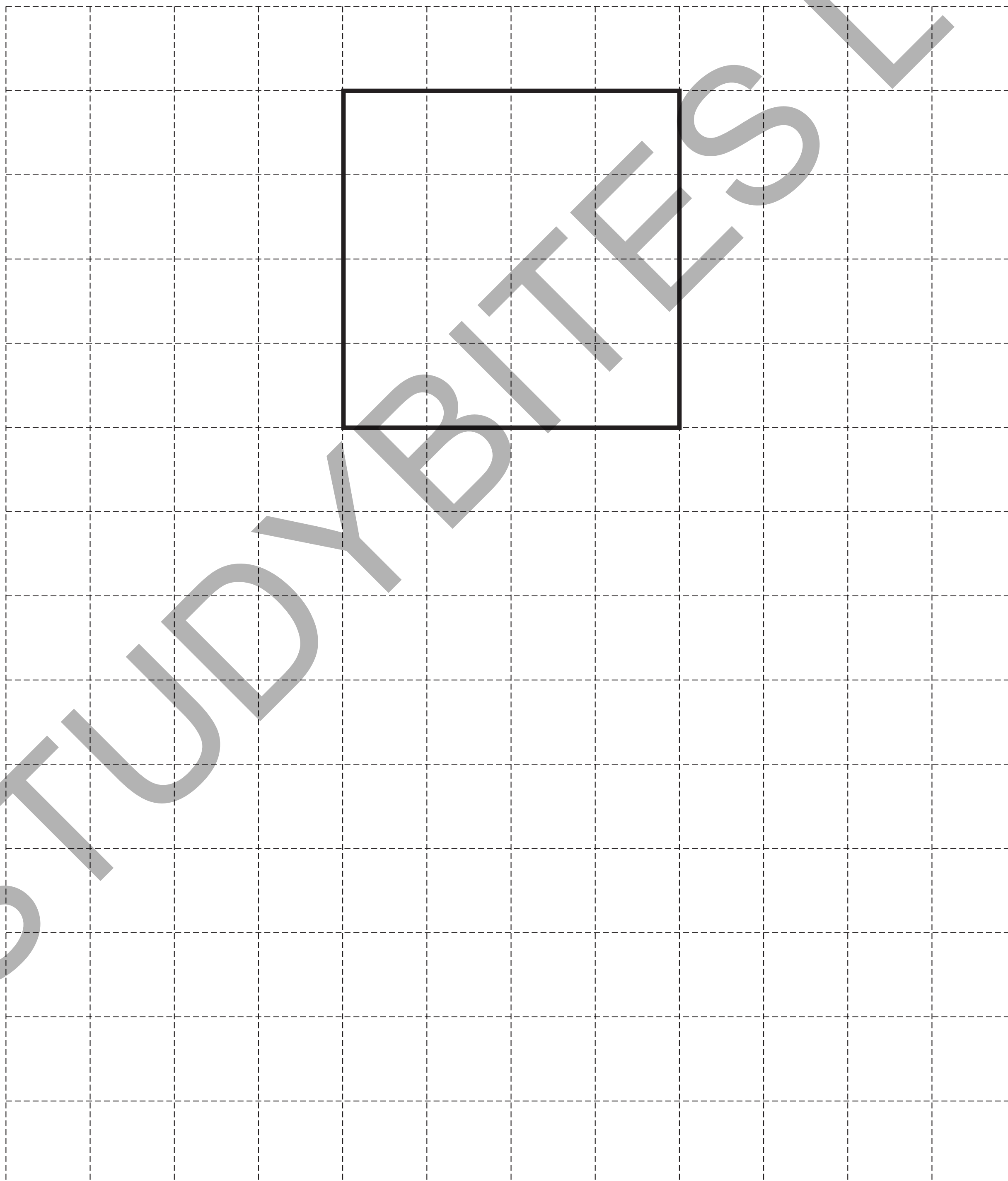
10

NOT TO
SCALE

The diagram shows a right-angled triangular prism.

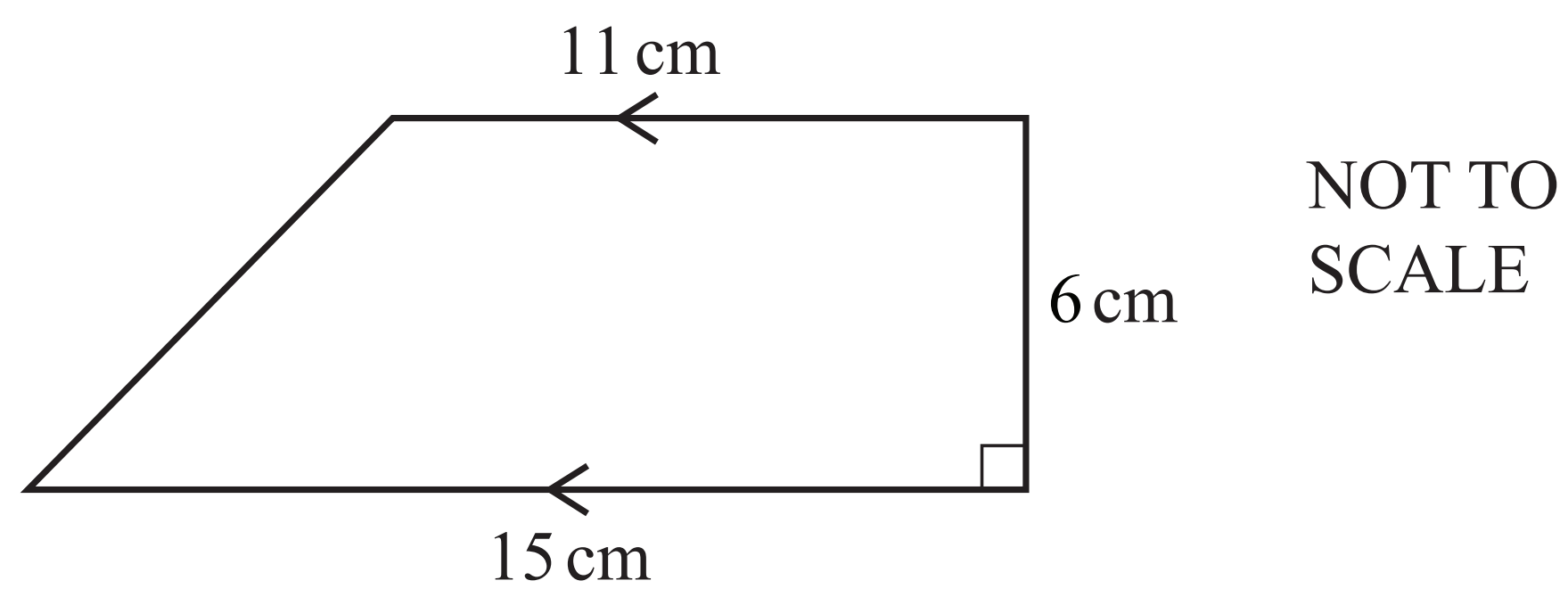
Complete the net of this prism.

One face has been drawn for you.



[4]

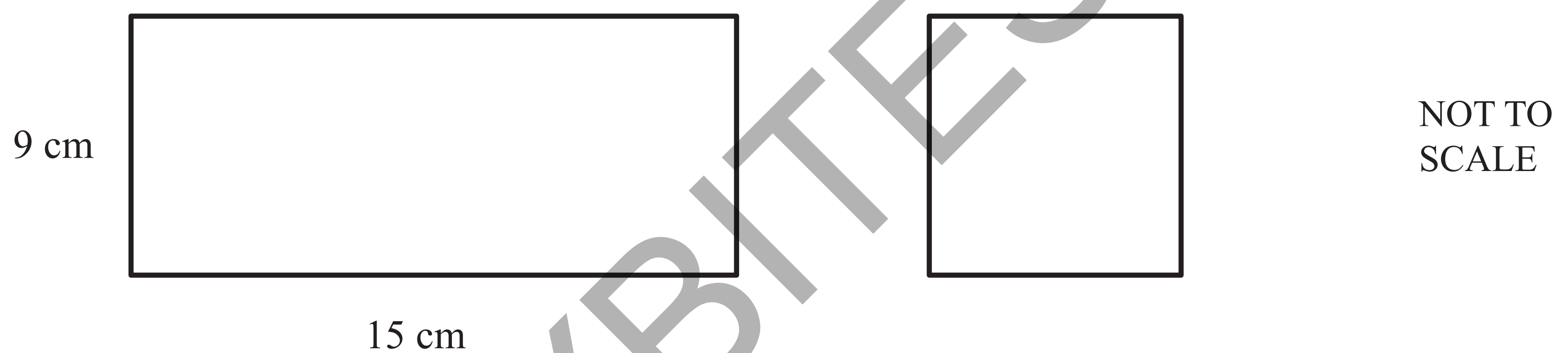
11 (a)



Calculate the area of this trapezium.

78 cm² [2]

(b) A rectangle and a square are shown.

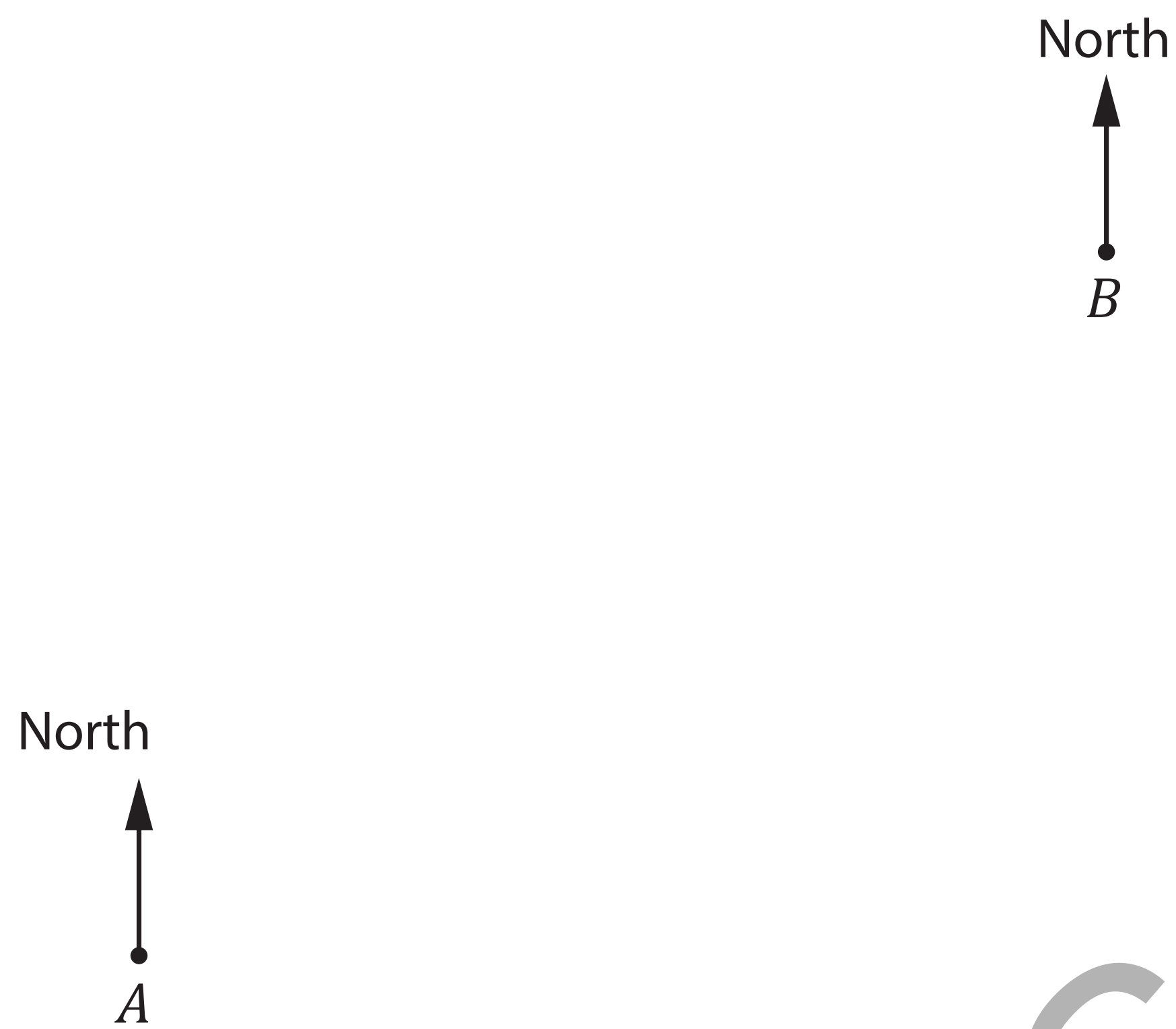


The area of the rectangle is exactly $3\frac{3}{4}$ times the area of the square.

Find the perimeter of the square.

24 cm [5]

- 12 The scale drawing shows the positions of town *A* and town *B*.
The scale is 1 centimetre represents 10 kilometres.



Scale: 1 cm to 10 km

- (a) Work out the actual distance from town *A* to town *B*.

..... km [2]

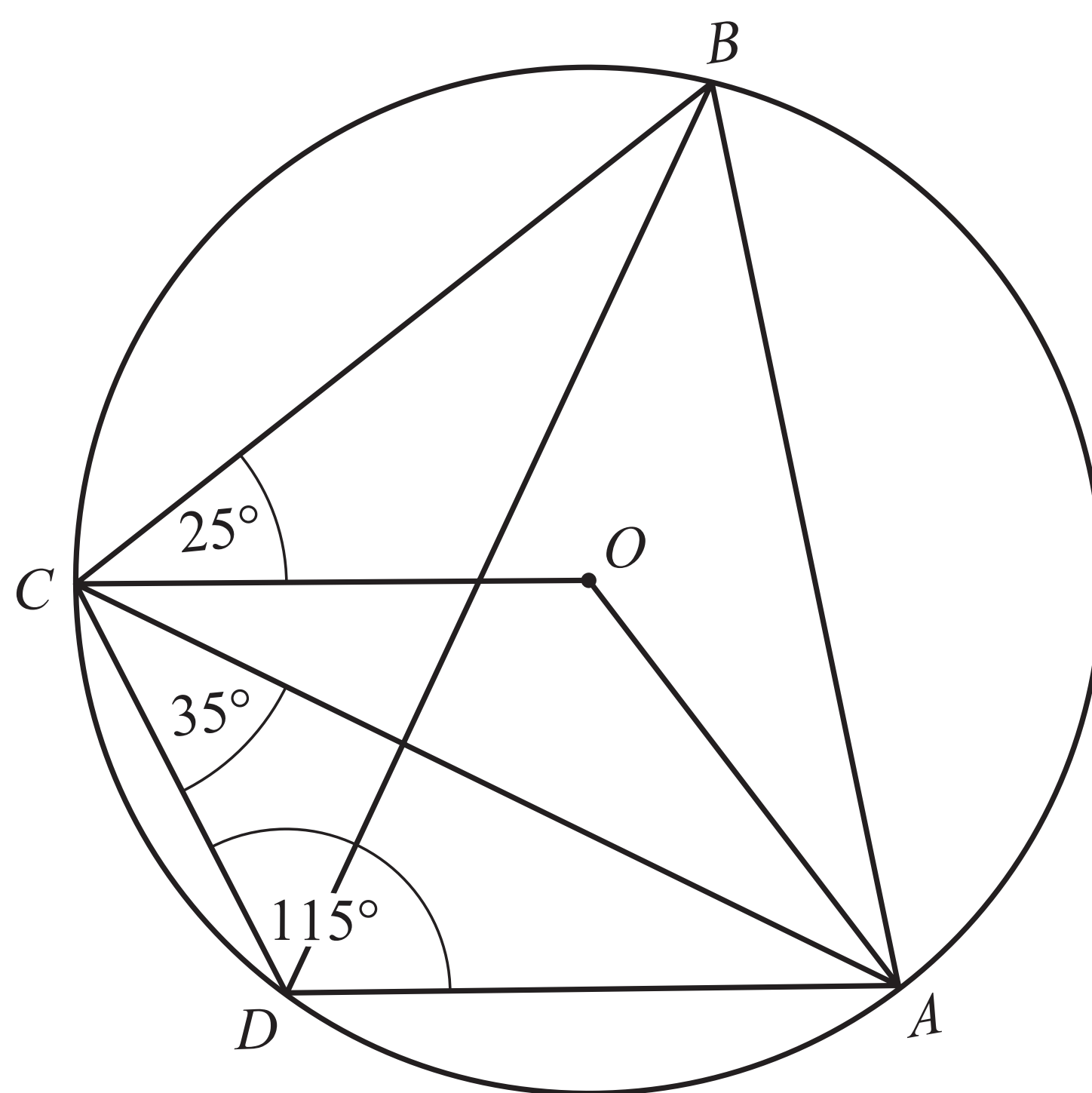
- (b) Measure the bearing of town *B* from town *A*.

..... [1]

- (c) Town *C* is 70 km from town *A* on a bearing of 080° .
On the scale drawing, mark the position of town *C*.

[2]

13

NOT TO
SCALE

In the diagram, A , B , C and D lie on the circle, centre O .
 Angle $ADC = 115^\circ$, angle $ACD = 35^\circ$ and angle $BCO = 25^\circ$.

- (a) Show that obtuse angle $AOC = 130^\circ$.
 Give a reason for each step of your working.

[3]

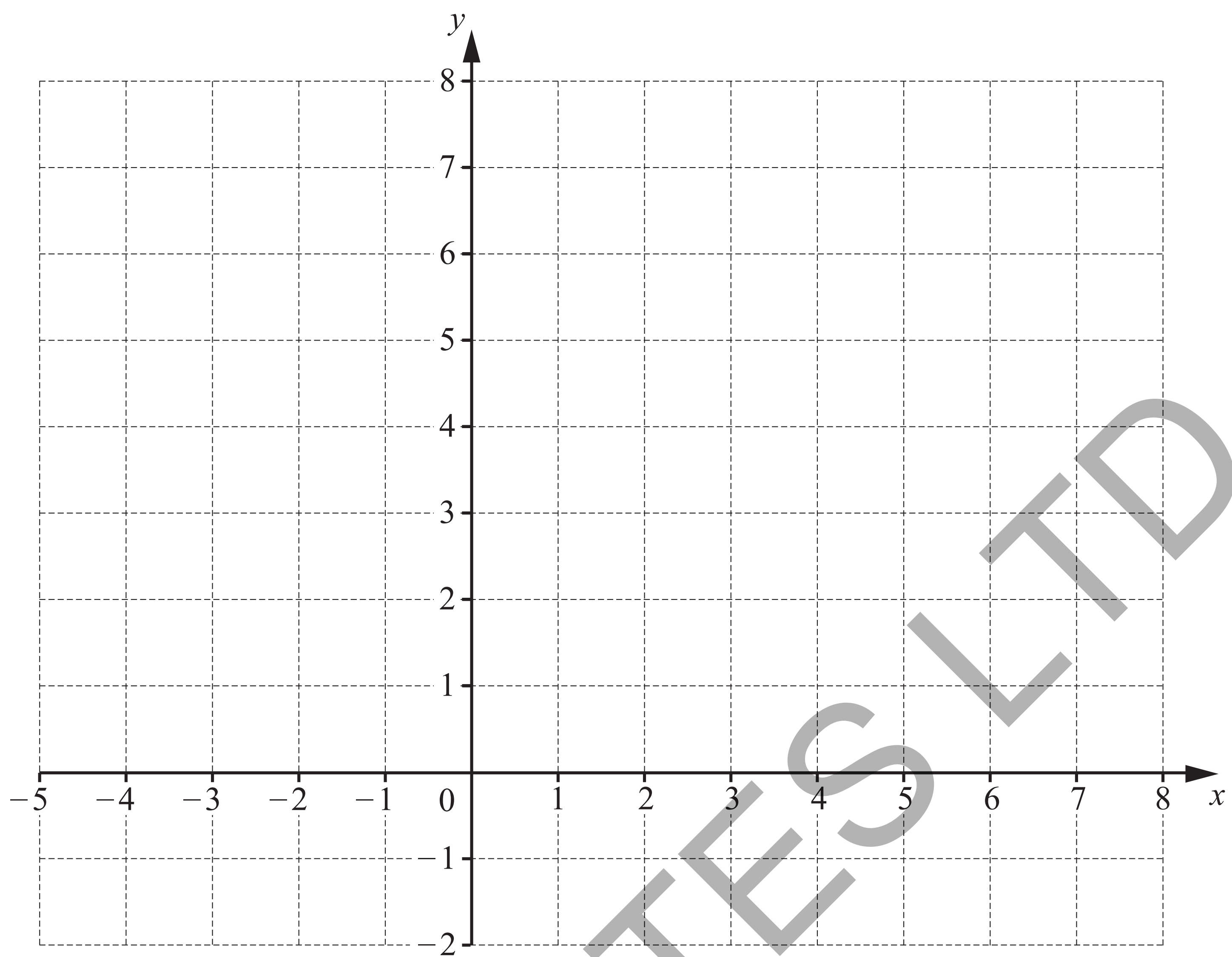
- (b) Find angle BAO .

Angle $BAO = \dots\dots\dots 40^\circ$ [2]

- (c) Find angle ABD .

Angle $ABD = \dots\dots\dots 35^\circ$ [1]

14



By shading the **unwanted** regions of the grid, draw and label the region R which satisfies the following three inequalities:

$$y \geq -1$$

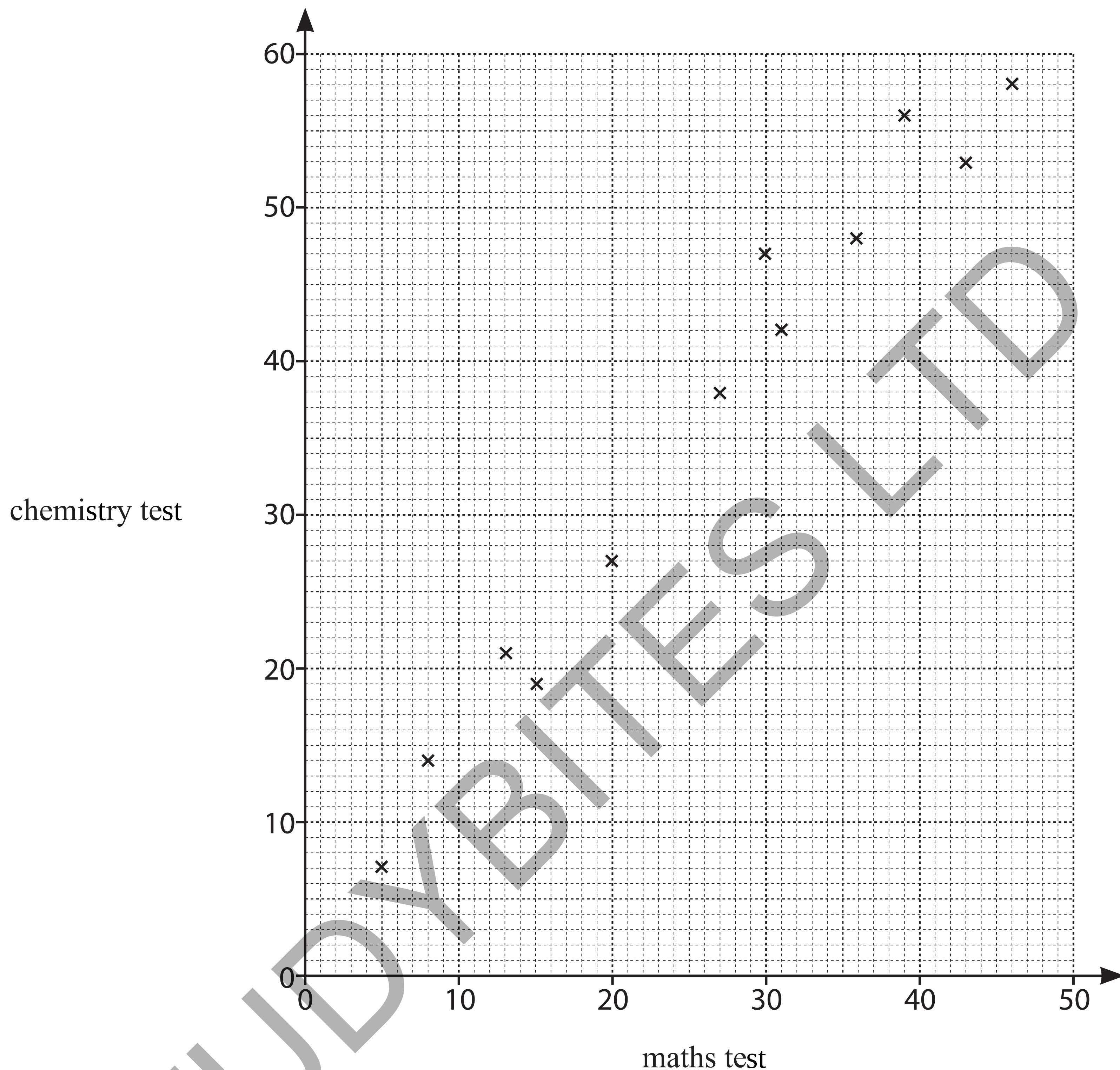
$$x < 4$$

$$y \leq x + 3$$

[4]

15 A teacher records the marks students score in a Maths test and a Chemistry test.

The scatter diagram shows the scores for twelve students.



(a) What type of correlation is shown in the scatter diagram?

positive..... [1]

(b) On the scatter diagram, draw a line of best fit.

[1]

(c) Another student scores 25 in Maths.

Use your line of best fit to find an estimate for his score in Chemistry.

..... [1]

16



The diagram shows two glasses which are mathematically similar.

The larger glass has a capacity of 1.6 litres and the smaller glass has a capacity of 0.2 litres.

The height of the larger glass is 20 cm.

Calculate the height of the smaller glass.

.....10..... cm [3]

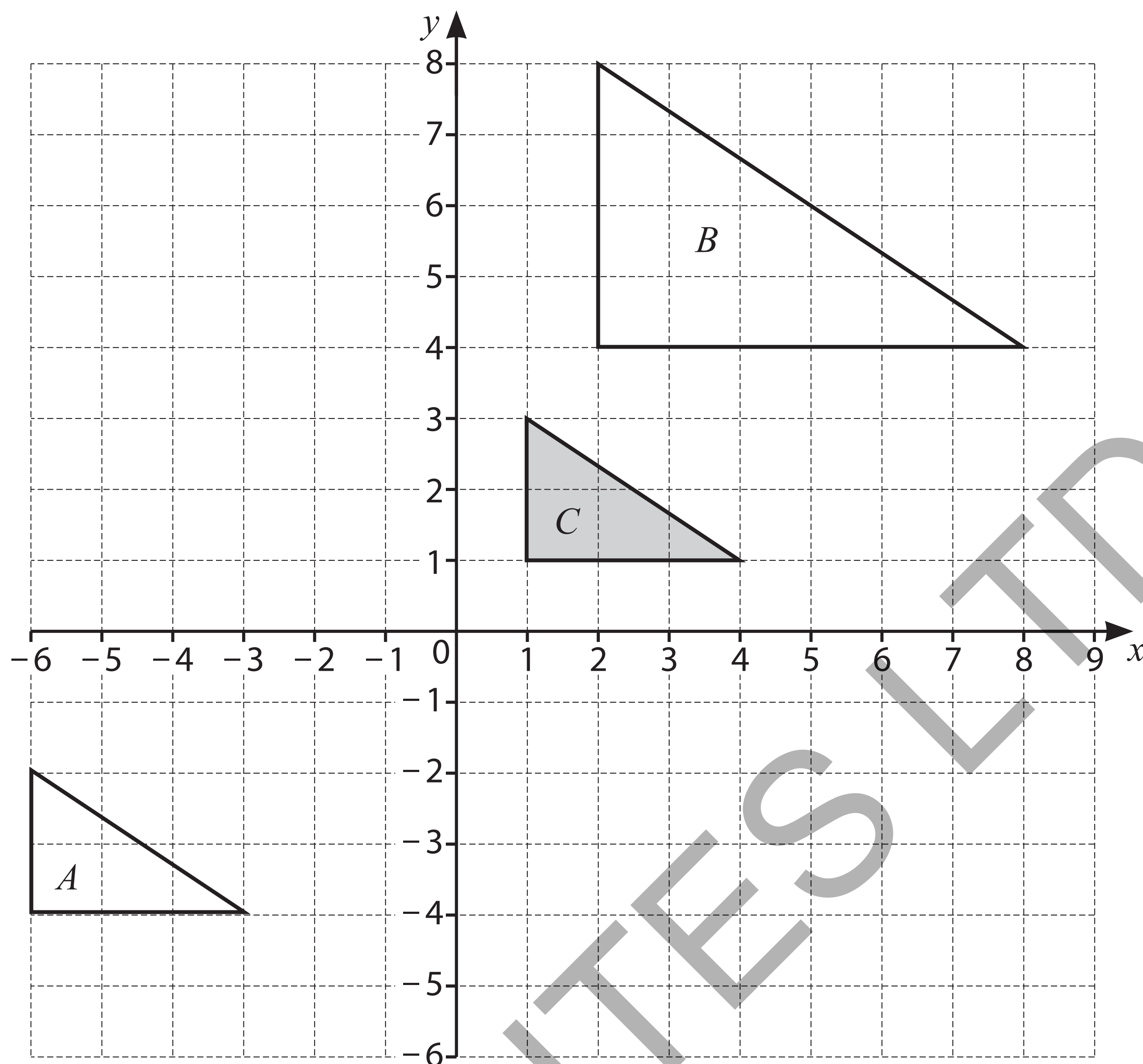
17 P is directly proportional to the cube root of $(q+1)$.

When $q = 7$, $P = 10$.

Find P when $q = 63$.

$P =$ 20..... [3]

18



(a) On the grid, draw the image of triangle C after a rotation, 90° anti-clockwise, centre $(0, 0)$. [2]

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

Translation, $\begin{pmatrix} -7 \\ -5 \end{pmatrix}$

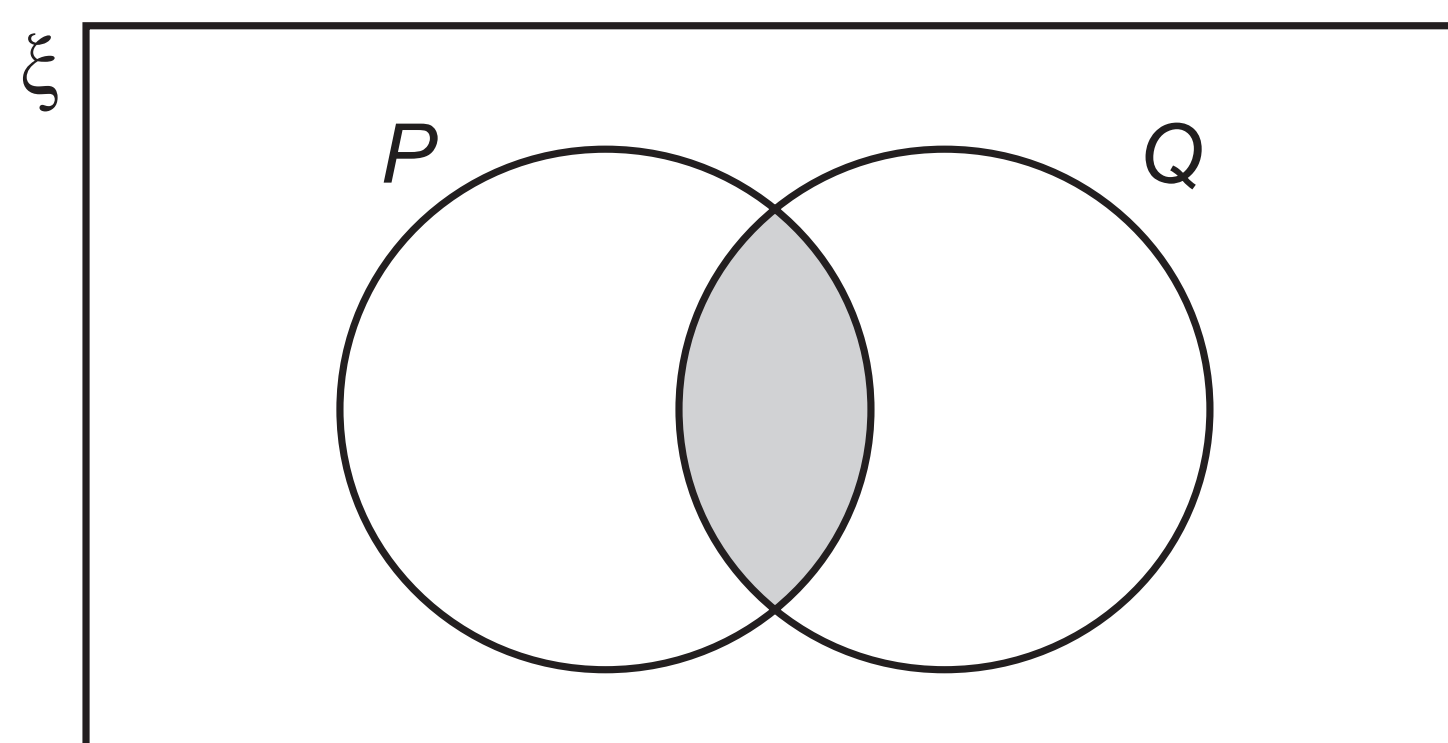
[2]

(c) Describe fully the **single** transformation that maps triangle C onto triangle B .

Enlargement, scale factor 2,
centre $(0, -2)$

[3]

19 (a)



Use set notation to describe the shaded region.

$P \cap Q$

[1]

(b)

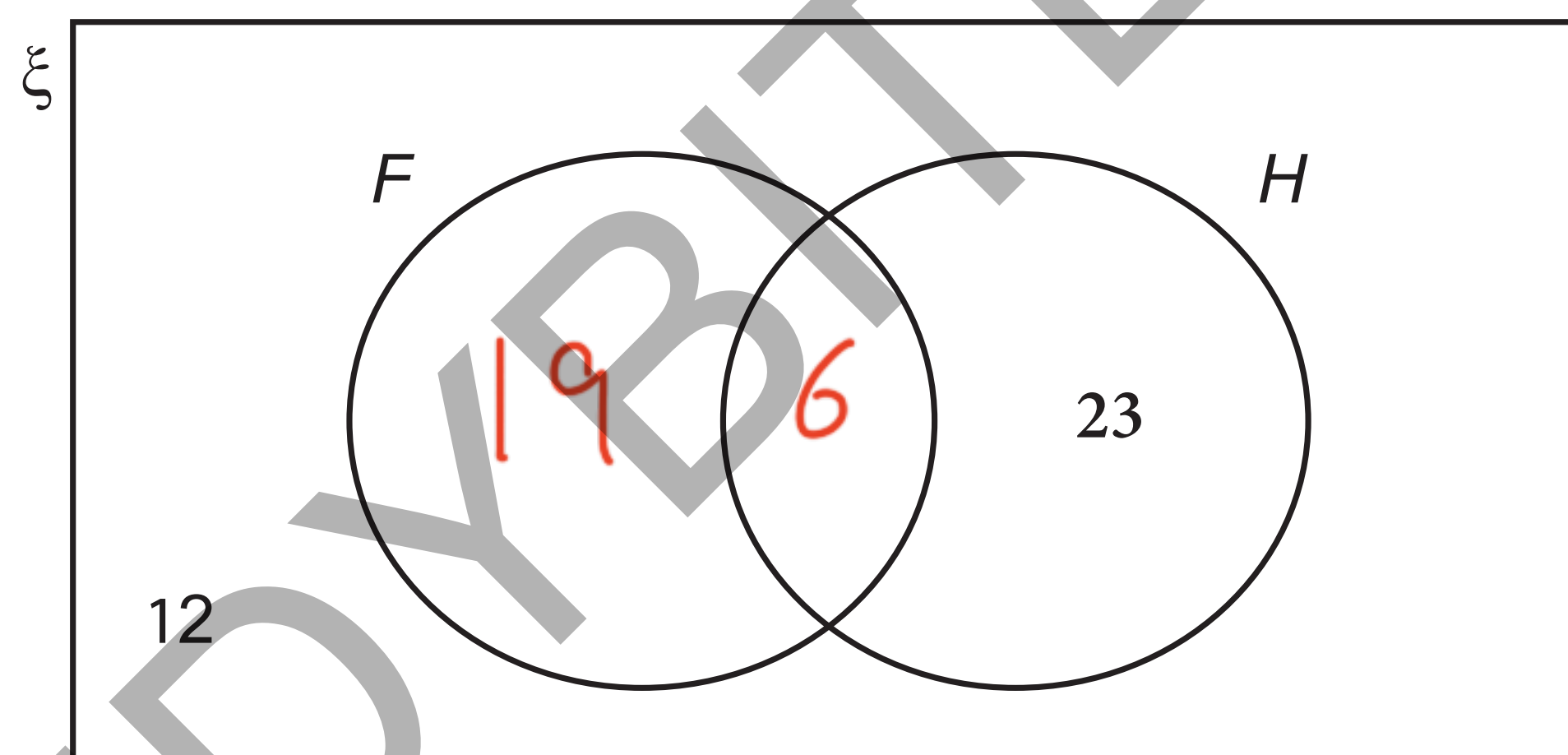
$\xi = \{\text{people in a club}\}$

$F = \{\text{people who play football}\}$

$H = \{\text{people who go hiking}\}$

There are 60 people in the club.

29 people go hiking.



(i) Complete the Venn diagram.

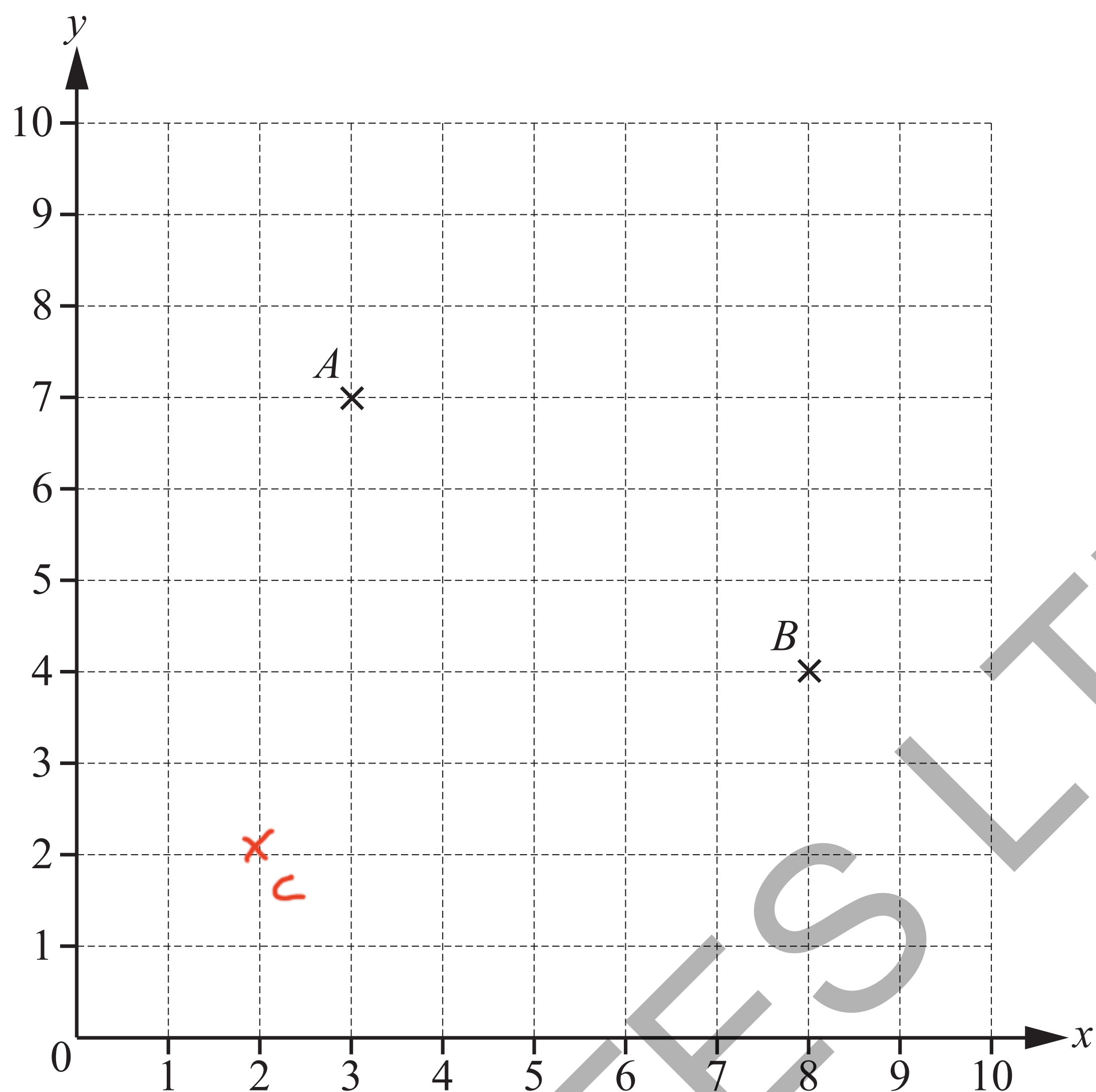
[2]

(ii) Find $n(F')$.

35

[1]

20



Points A and B are marked on the grid.

$$\overrightarrow{BC} = \begin{pmatrix} -6 \\ -2 \end{pmatrix}$$

(a) On the grid, plot the point C .

[1]

(b) Write $\overrightarrow{AC}$ as a column vector.

$$\begin{pmatrix} -1 \\ -5 \end{pmatrix} \quad [1]$$

(c) $\overrightarrow{DE}$ is a vector that is perpendicular to $\overrightarrow{BC}$.

The magnitude of $\overrightarrow{DE}$ is equal to the magnitude of $\overrightarrow{BC}$.

Write down a possible column vector for $\overrightarrow{DE}$.

$$\begin{pmatrix} 2 \\ -6 \end{pmatrix} \quad [2]$$

21

$$1.4 \times 20.2 = 28.28$$

Work out.

(a) 0.14×2.02

$$0.2828 \dots [1]$$

(b) $282.8 \div 202$

$$1.4 \dots [1]$$

22 (a) Simplify.

$$(\sqrt{0.7})^2$$

$$0.7 \dots [1]$$

(b) Rationalise the denominator.

$$\frac{6}{3 - \sqrt{3}}$$

Give your answer in its simplest form.

$$3 + \sqrt{3} \dots [3]$$

23 (a) Factorise.

$$4x^2 - 20x^3$$

$$4x^2(1 - 5x) \dots [2]$$

(b) Expand and simplify.

$$(2x + 3)(x - 4) - (x + 2)(x - 5)$$

$$x^2 - 2x - 2$$

~~$$x^2 - 2x - 2$$~~

..... [3]

(c) Solve.

$$\frac{1}{x-2} + \frac{x}{x+4} = \frac{-2}{3}$$

$$x = -1 \text{ or } x = \frac{4}{5} \quad [5]$$

24 Line M passes through the points $(0, 5)$ and $(4, 17)$.

(a) Find the equation of line M .

$y = 3x + 5$ [3]

(b) Line N is perpendicular to line M and passes through the point $(0, -2)$.

Find the equation of line N .

$y = -\frac{1}{3}x - 2$ [2]

25 100 students take a small quiz.

The table shows information about the time taken by each student to finish the quiz.

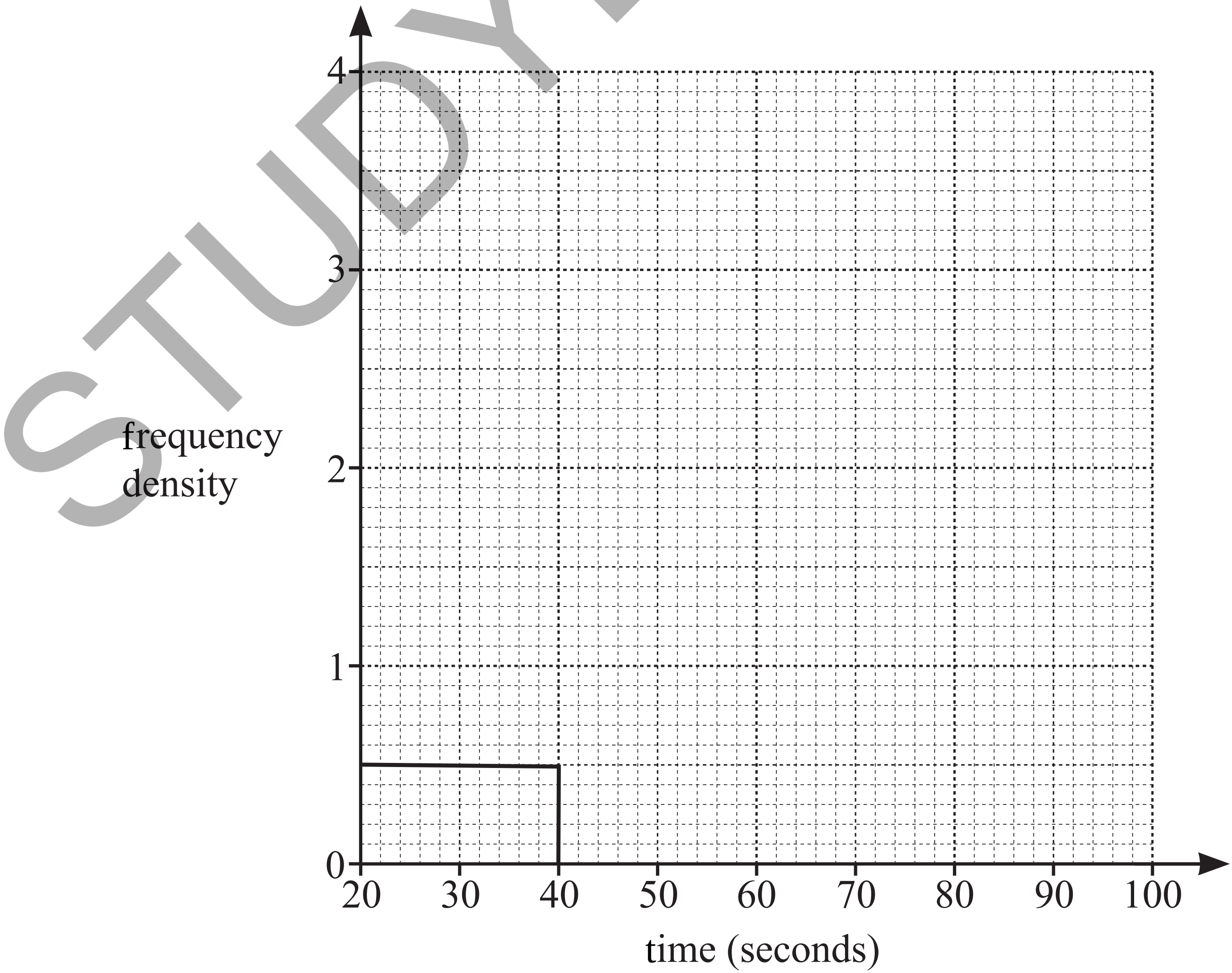
time (<i>t</i> seconds)	$20 < t \leq 40$	$40 < t \leq 60$	$60 < t \leq 100$
frequency	10	70	20

(a) Work out an estimate of the mean.

.....s [3]

54

(b) Complete the histogram to show the information in the table.



[2]

Exam 4 - Paper 1

1 (a) Write the number 83042 in words.

Eighty-three thousand and Forty-two [1]

(b) Write down the value of the 5 in the number 465 802.

five thousand [1]

(c) Write 7522 correct to

(i) the nearest hundred

7500 [1]

(ii) the nearest ten.

7520 [1]

2 (a) Write $\frac{9}{100}$ as a percentage.

9% [1]

(b) Write 155% as a decimal.

1.55 [1]

3 Tom records the favourite sport of each of 20 students in his class.

Football Golf Hockey Rugby Football Tennis Rugby Football Football Rugby

Tennis Football Rugby Football Golf Football Rugby Football Golf Golf

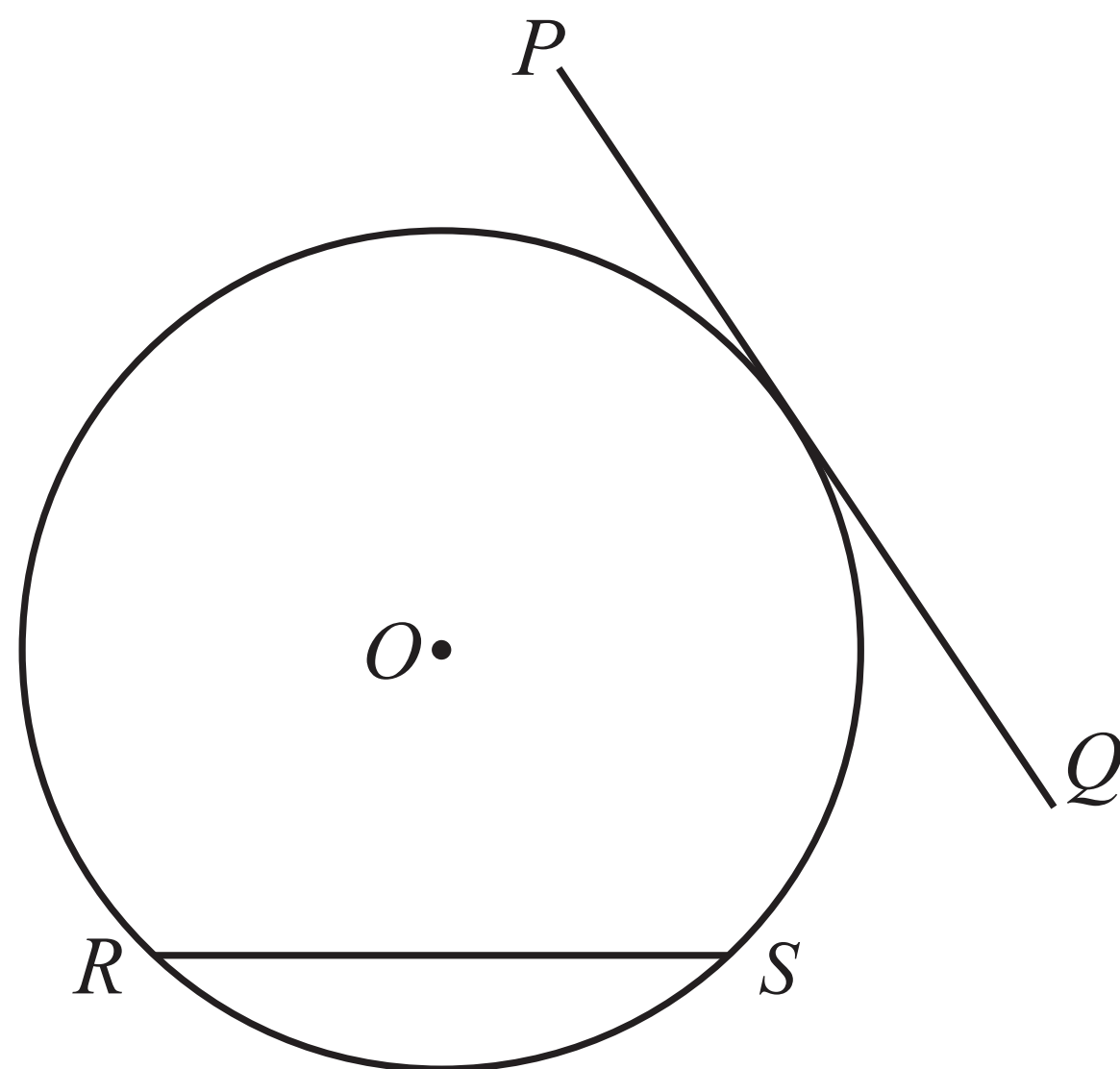
Complete the frequency table.

You may use the tally column to help you.

sport	tally	frequency
golf		4
football		8
hockey		1
tennis		2
rugby		5

[2]

4



NOT TO SCALE

The diagram shows a circle, centre O , and lines PQ and RS .

Write down the mathematical name for

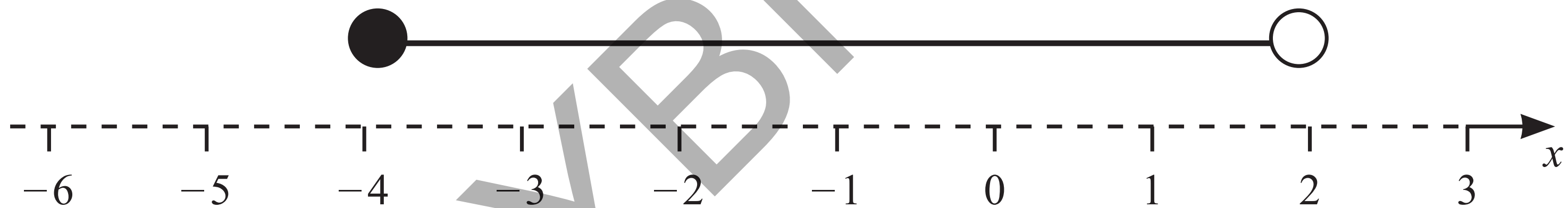
(a) line PQ ,

Tangent [1]

(b) line RS .

chord [1]

5



Write down the inequality represented on the number line.

$-4 \leq x < 2$ [1]

6 A farmer mixes feed for his livestock using corn, barley, and oats in the ratio

Corn : Barley : Oats = 4 : 7 : 13.

The mixture contains 1400 kg of barley.

Find the total mass of the feed mixture.

4800 kg [3]

7 The table shows the number of movies watched by some students during the holidays.

number of movies	0	1	2	3
frequency	2	4	y	8

Calculate the mean number of movies watched by the students.

8 (a) Simplify.

$3y - 4y + 2y$

.....2 [4]

(b) Solve.

(i) $x - 5 = -11$

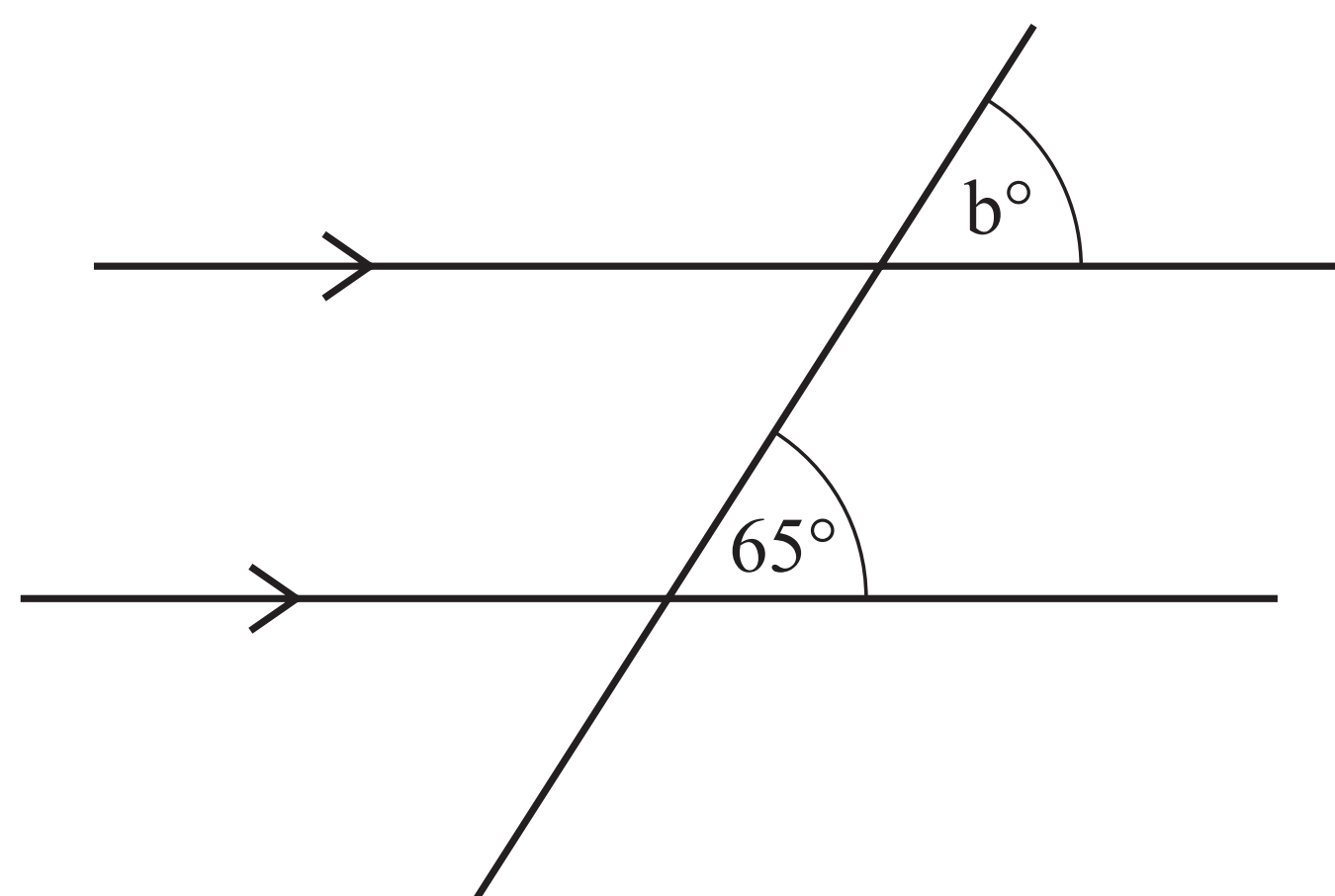
.....y [1]

(ii) $7 - 8x = 6$

$x =$ -6 [1]

$x =$ $\frac{1}{8}$ [2]

9

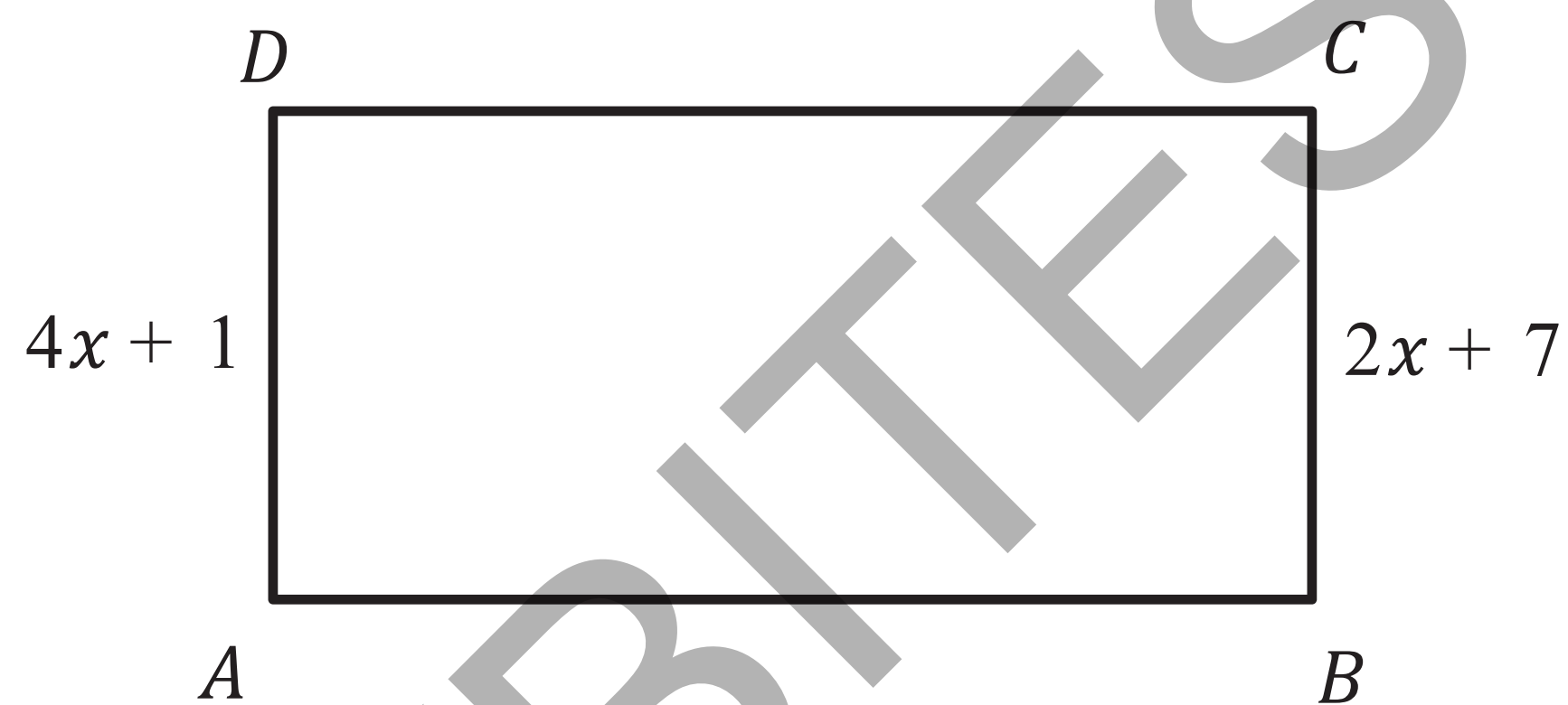


NOT TO
SCALE

Find the value of b .

$b = 65$ [1]

10 All lengths are in centimetres.



$$AD:DC = 1:2$$

Work out the area of the rectangle.

338 cm^2 [4]

11 $P = 2^4 \times 3^a \times 5^b \times 7$ $Q = 2 \times 3^3 \times 7^c$

The highest common factor (HCF) of P and Q is $2 \times 3^2 \times 7$.

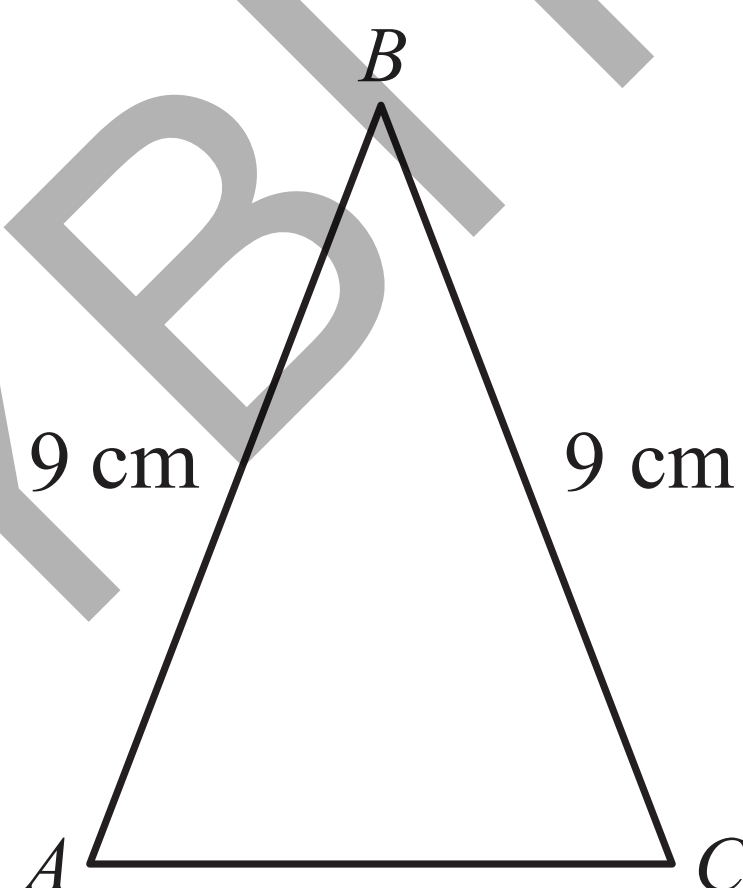
The lowest common multiple (LCM) of P and Q is $2^4 \times 3^3 \times 5 \times 7^3$.

Find the values of a , b and c .

$a = \dots\dots\dots 2$
 $b = \dots\dots\dots 1$
 $c = \dots\dots\dots 3$

[3]

12



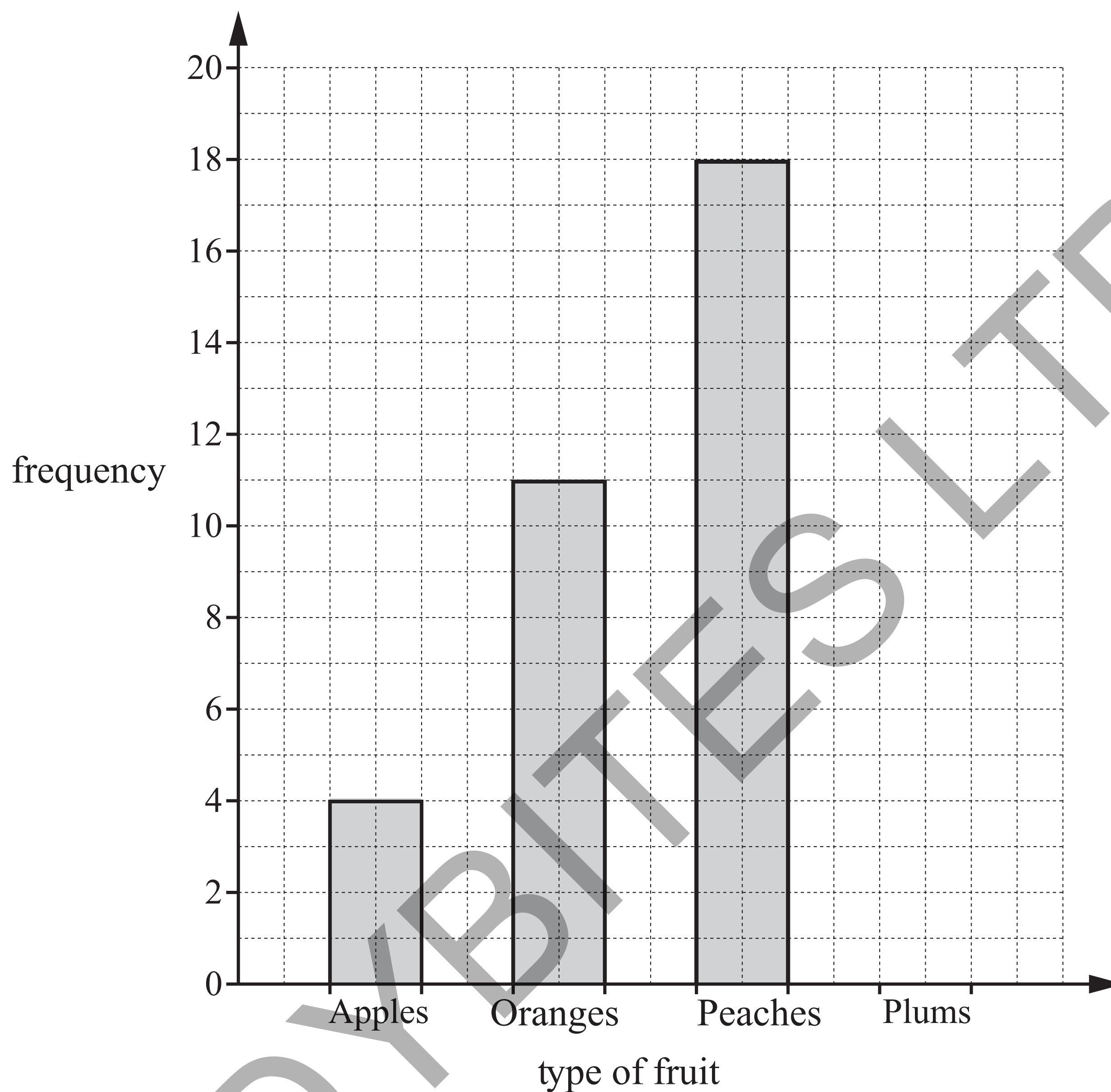
NOT TO SCALE

It is given that $AB = BC = 9$ cm and $\sin B = \frac{2}{3}$.

Calculate the area of the triangle.

$\dots\dots\dots 27 \dots\dots\dots \text{cm}^2$ [3]

- 13 On a Saturday afternoon, a farm stand sells a total of 40 fruits. The items sold are categorized into four types: Apples, Oranges, Peaches, and Plums. The bar chart below displays the recorded amounts for Apples, Oranges and Peaches.



- (a) Complete the bar chart. [3]
- (b) Find how many more peaches were sold than oranges. [1]
- 7
- (c) Write down the modal type of fruit sold. [1]
- peaches
- (d) A customer picks a fruit at random from the total amount sold. Find the probability that it is an apple. [1]
- $\frac{1}{10}$

14 The table shows the temperature in the morning each day for one week in a village.

monday	tuesday	wednesday	thursday	friday	saturday	sunday
7°C	3°C	−4°C	−2°C	0°C	3°C	−5°C

(a) Which day had the lowest temperature?

Sunday

[1]

(b) Find the difference between the temperatures on wednesday and friday.

4

°C [1]

(c) Write these seven temperatures in order, starting with the lowest.

−5°C

−4°C

−2°C

0°C

3°C

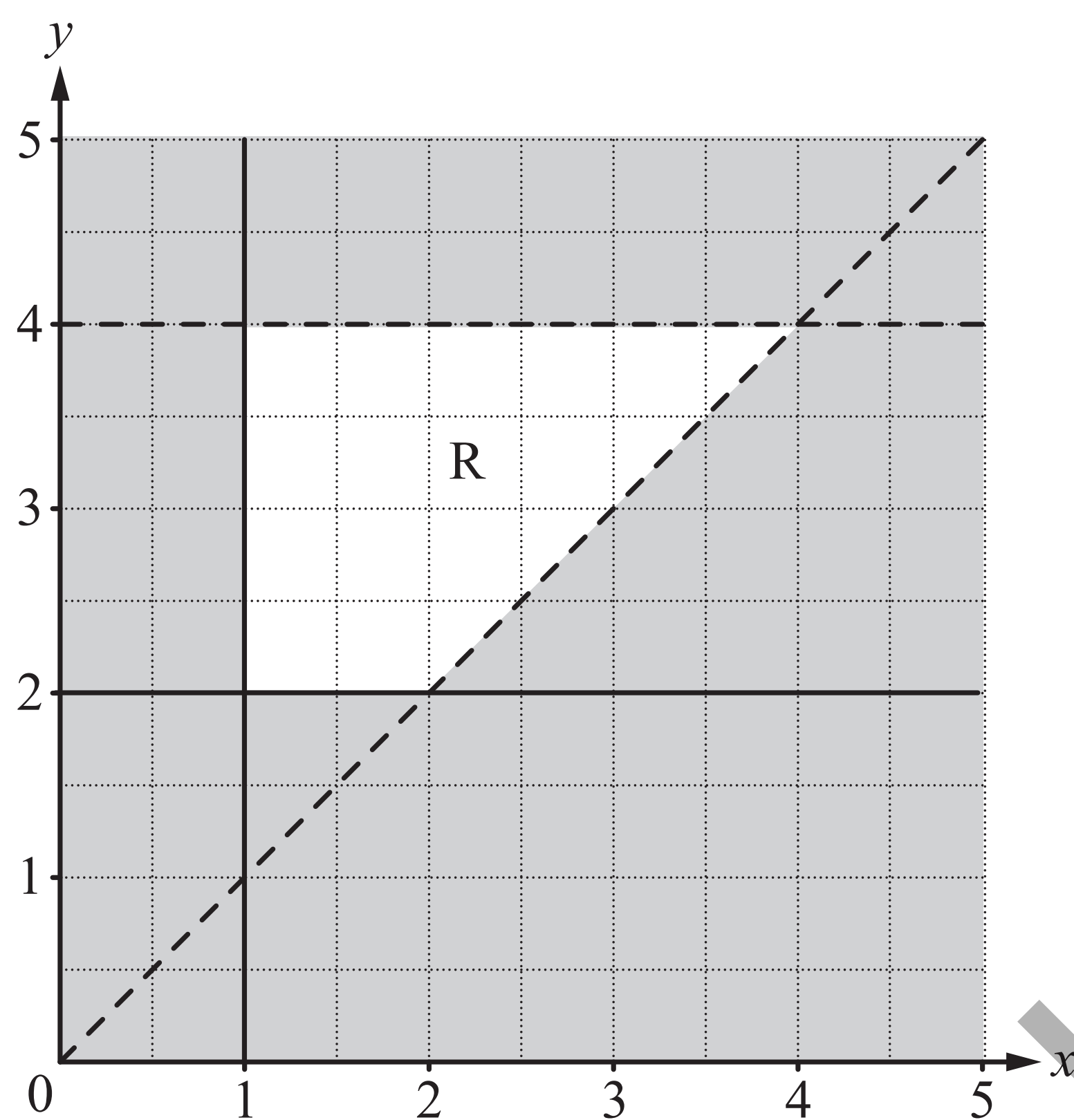
3°C

7°C

Lowest

[1]

15



Find four inequalities that define the region R on the grid.

$$x \geq 1$$

$$y \geq 2$$

$$y \leq 4$$

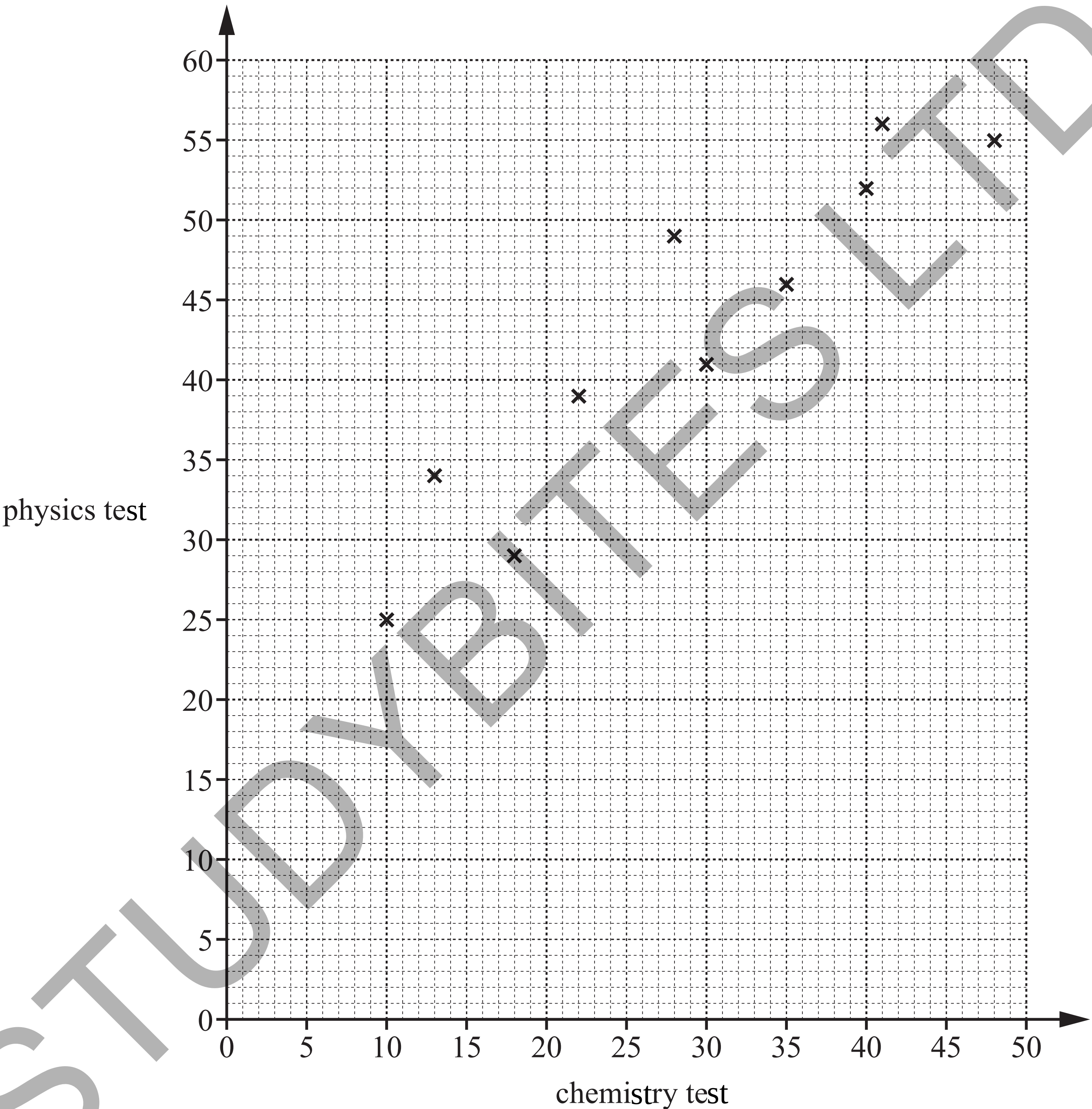
$$y > x$$

[4]

16 Fourteen students each complete two assessments in Science: a Chemistry test and a Physics test. The table below records their marks.

chemistry test	10	13	48	30	35	18	41	40	22	28	20	44	37	46
physics test	25	34	55	41	46	29	56	52	39	49	34	51	46	56

- (a) Complete the scatter diagram.
The first ten points have been plotted for you.



- (b) What type of correlation is shown in this scatter diagram?

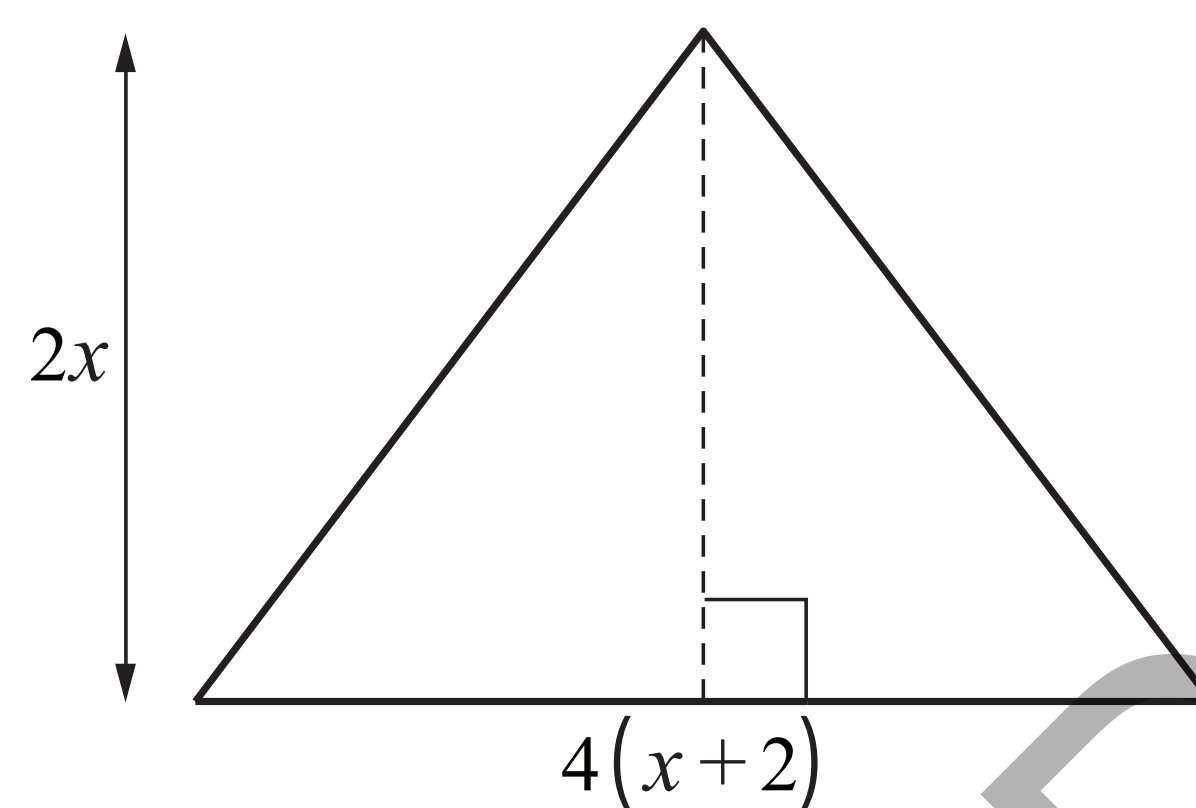
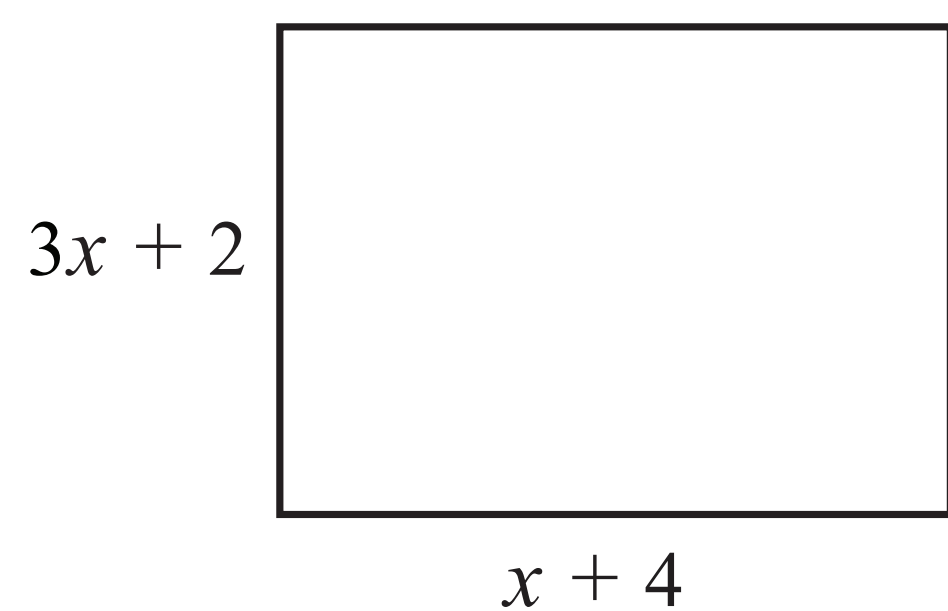
.....positive..... [1]

- (c) On the scatter diagram, draw a line of best fit.

- (d) Use your line of best fit to estimate the Physics test score for a student who scored 25 marks in the Chemistry test.

..... [1]

- 17 The diagrams below show a rectangle and a triangle.
All measurements are in centimetres.



- (a) Find an expression for the area of the **rectangle**.

$(3x + 2)(x + 4)$ [1]

- (b) Given that the area of the rectangle is equal to the area of the triangle,
show that $x^2 - 6x - 8 = 0$.

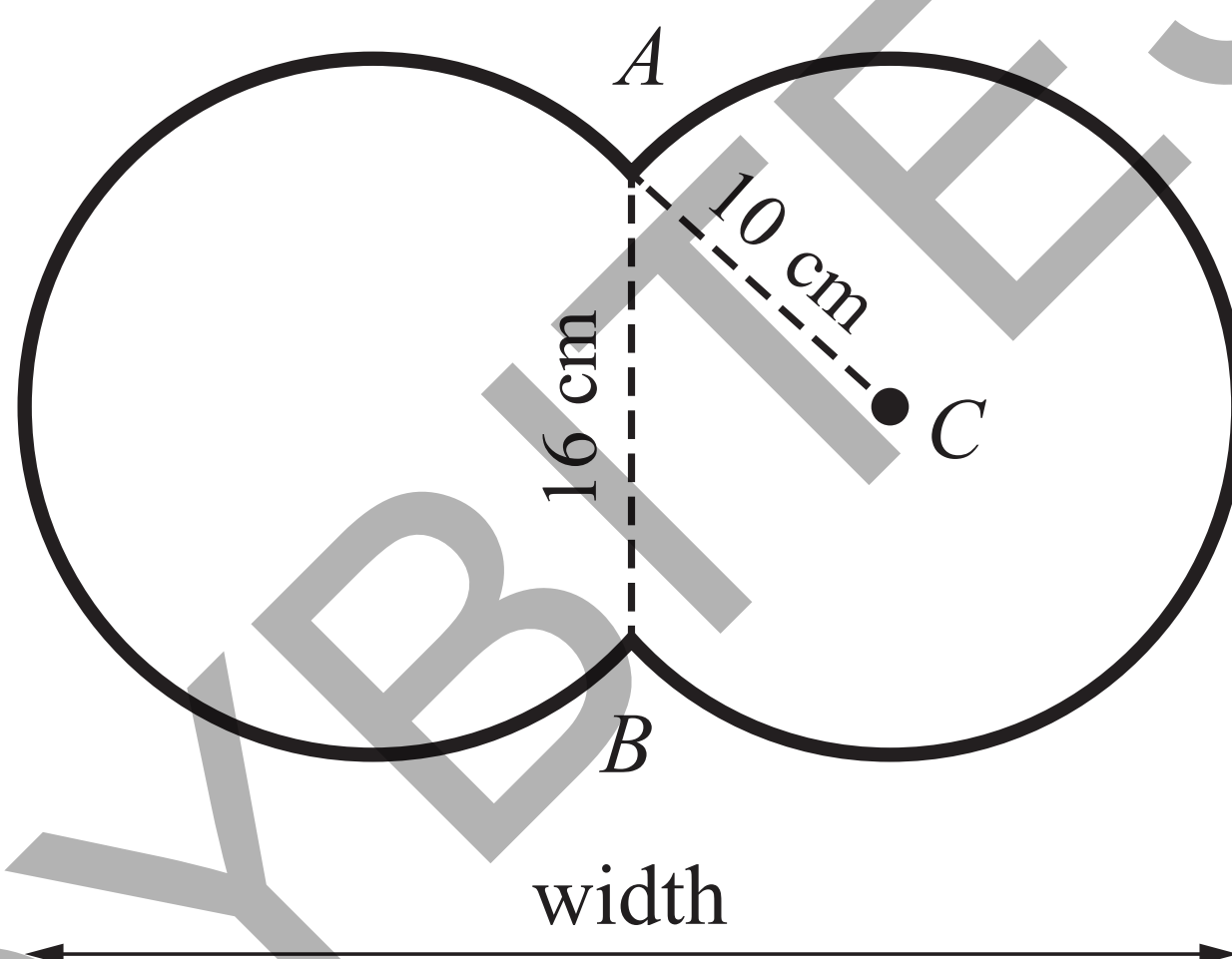
[4]

- (c) Solve $x^2 - 6x - 8 = 0$ by completing the square.
Give your answer in the form, $p \pm \sqrt{q}$ where p and q are integers.

$$3 \pm \sqrt{17}$$

[3]

- 18 A designer creates a company logo consisting of two overlapping, identical circles. The shared boundary between the two circles forms a common chord AB .



NOT TO SCALE

AB has length 16 centimetres and the radius AC has length 10 centimetres.
Calculate the width of the logo.

$$32$$

[4]

- 19
- The weight, w grams, of a fruit is 274.9 grams, correct to 1 decimal place.
Complete the statement about the value of w .

274.85

$\leq w <$

274.95

[2]

- 20
- Calculate $(4.2 \times 10^5) \div (2.5 \times 10^{-7})$.
Give your answer in standard form.

1.68×10^{12}

~~1.68×10^8~~

[3]

- 21
- A group of 100 teenagers were surveyed about the distance they cycled to get to their sports club in one week.
The frequency table shows the results.

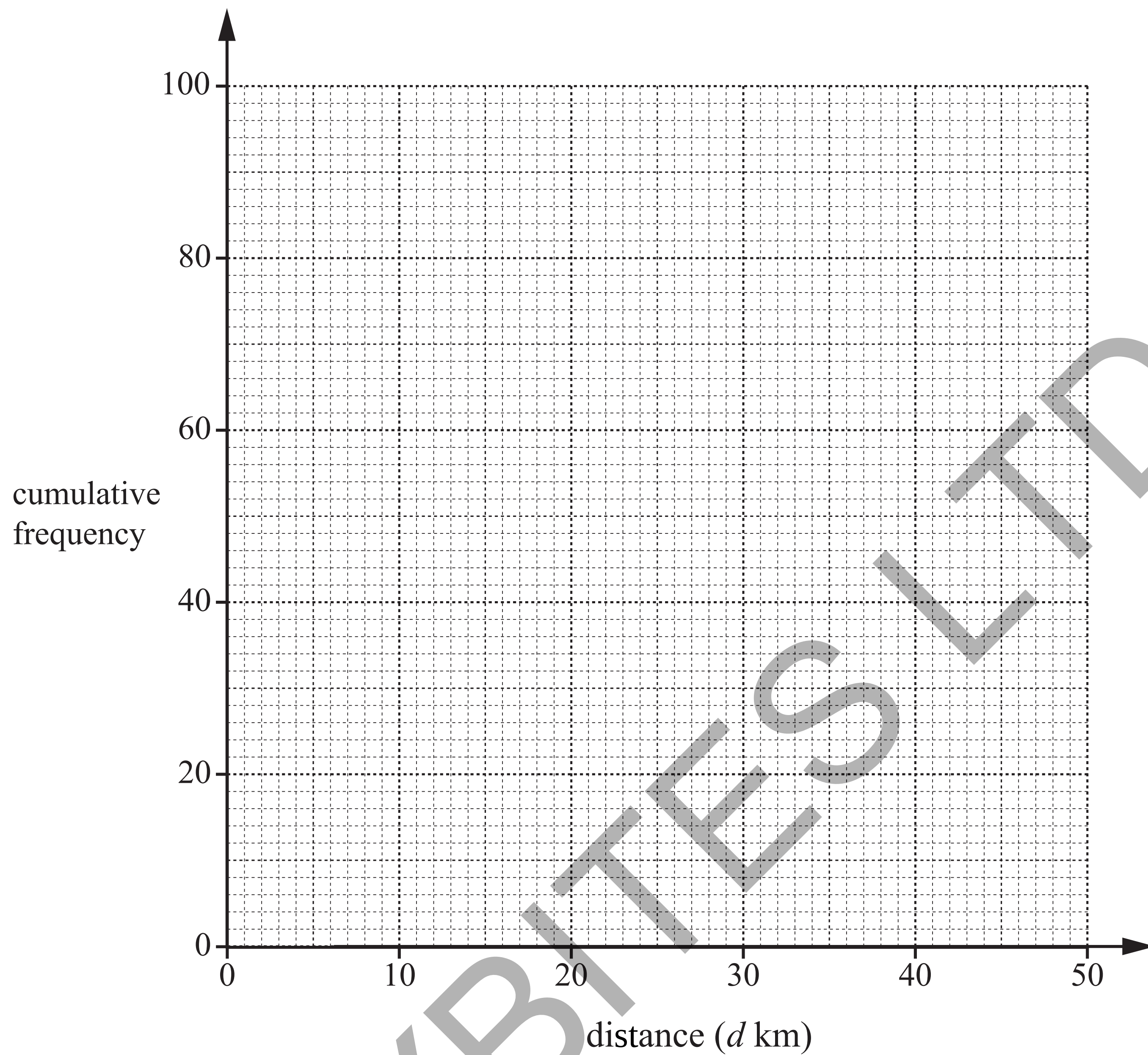
distance (d km)	$0 < d \leq 5$	$5 < d \leq 10$	$10 < d \leq 20$	$20 < d \leq 30$	$30 < d \leq 50$
frequency	12	28	38	14	8

- (a)
- Complete the cumulative frequency table below.

distance (d km)	$d \leq 5$	$d \leq 10$	$d \leq 20$	$d \leq 30$	$d \leq 50$
cumulative frequency	12	40	78	92	100

[2]

(b) On the grid, draw the cumulative frequency diagram.



[3]

(c) Use your cumulative frequency diagram to find an estimate for

(i) the median,

.....12..... [1]

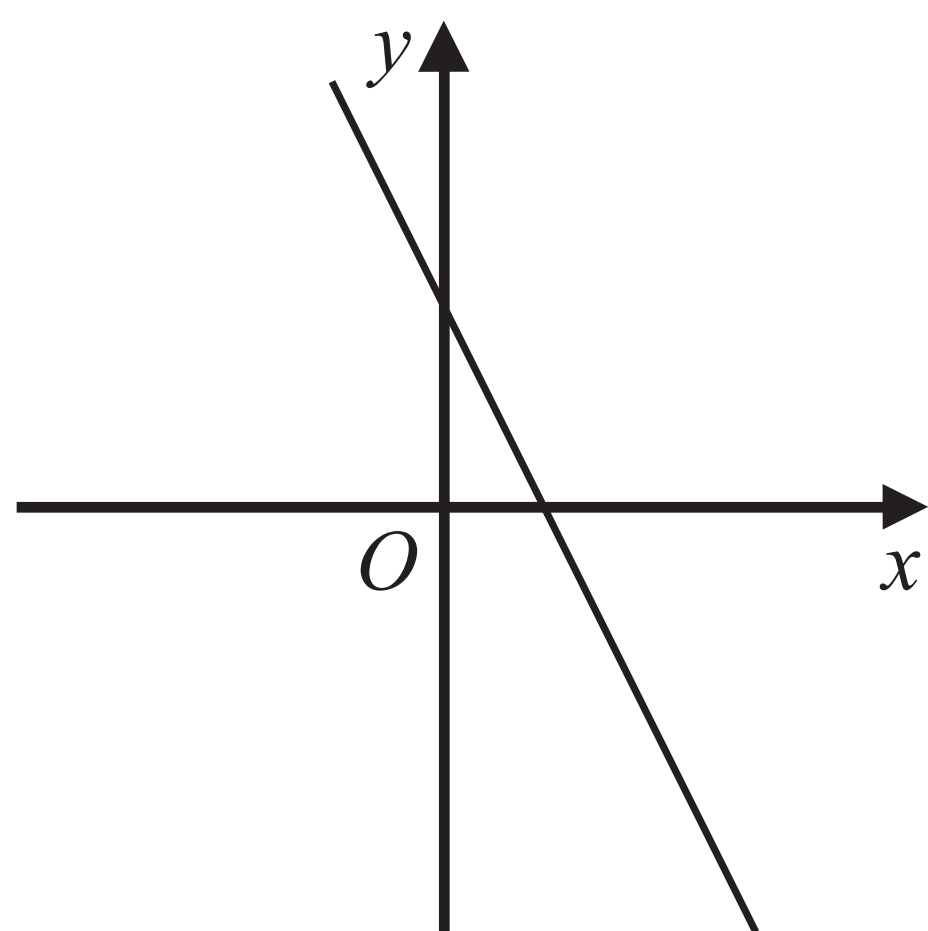
(ii) the interquartile range,

.....8..... [3]

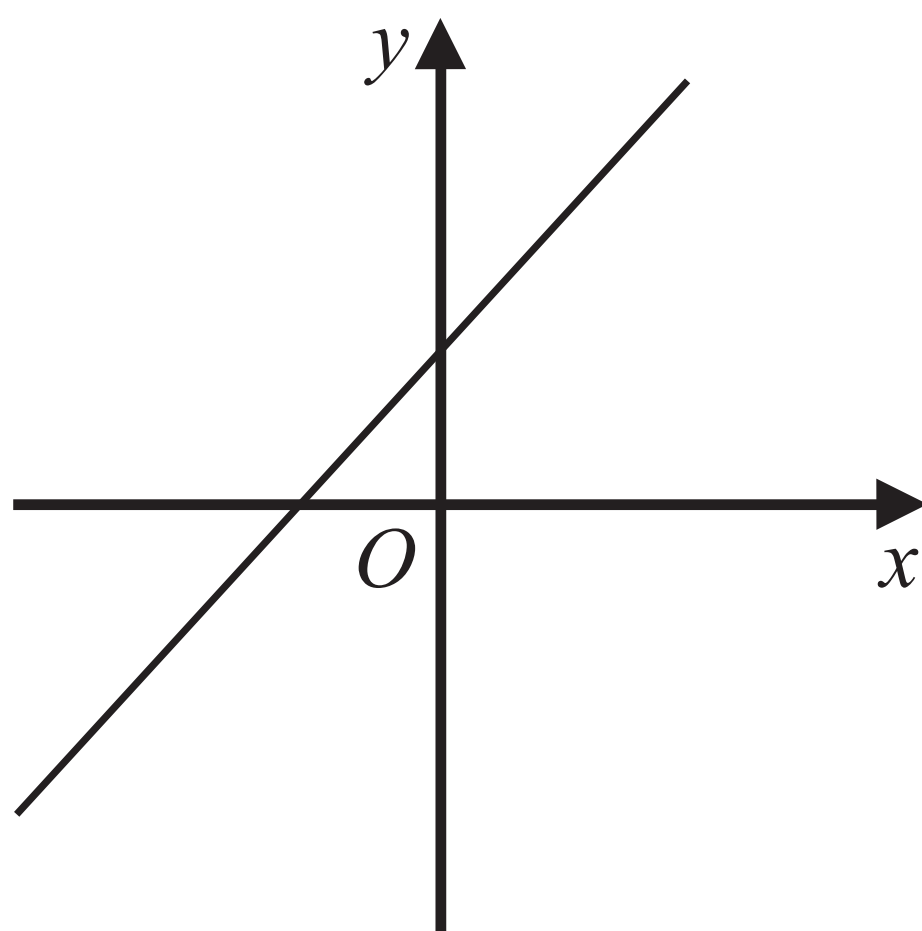
(iii) the number of teenagers who cycled more than 35 km.

.....4..... [2]

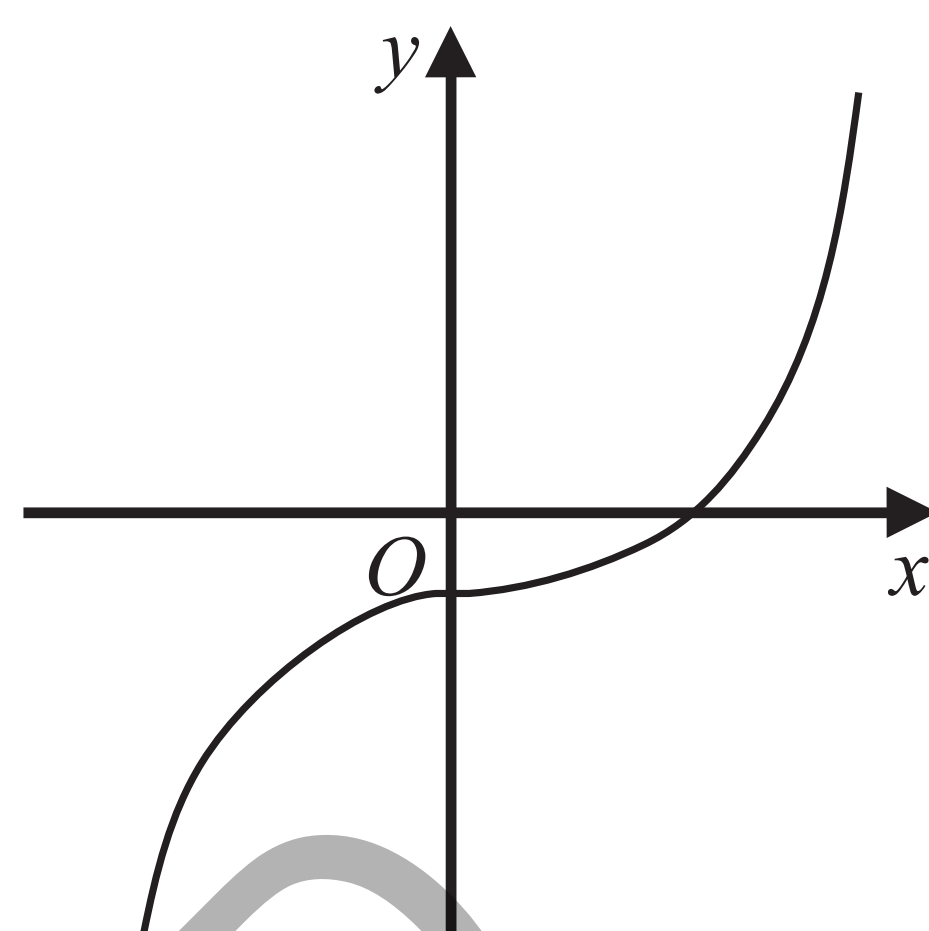
22 Here are the sketches of five graphs.



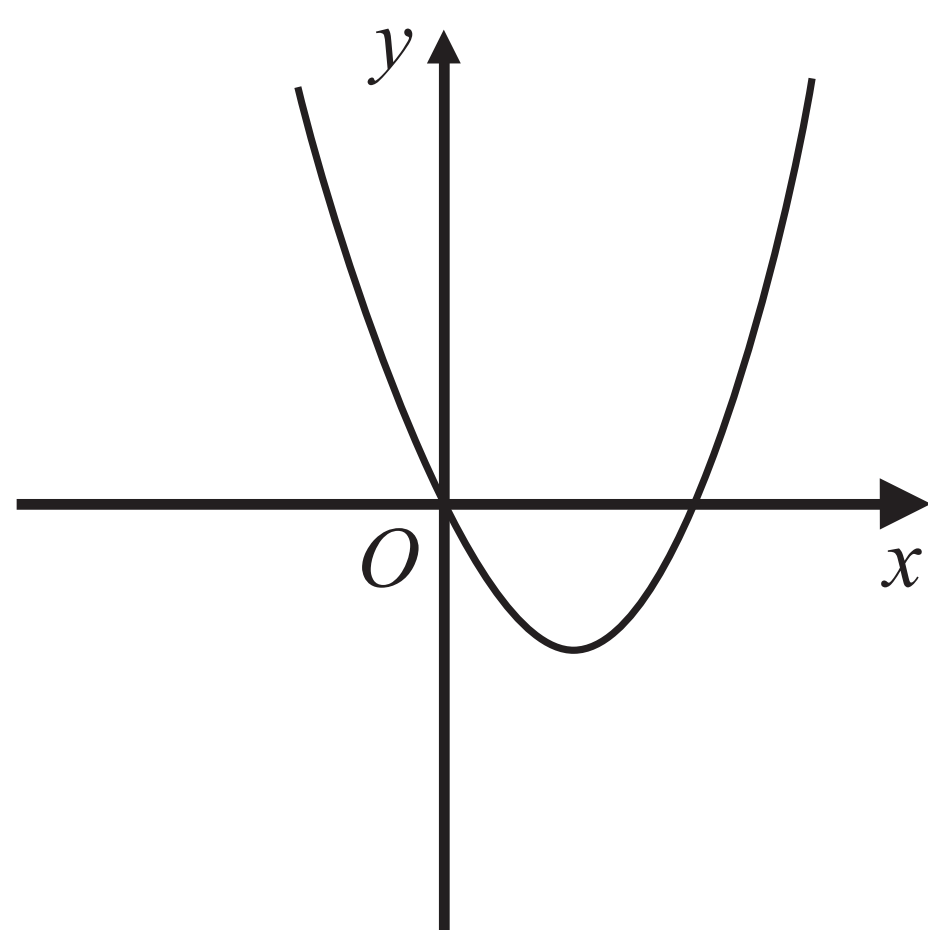
A



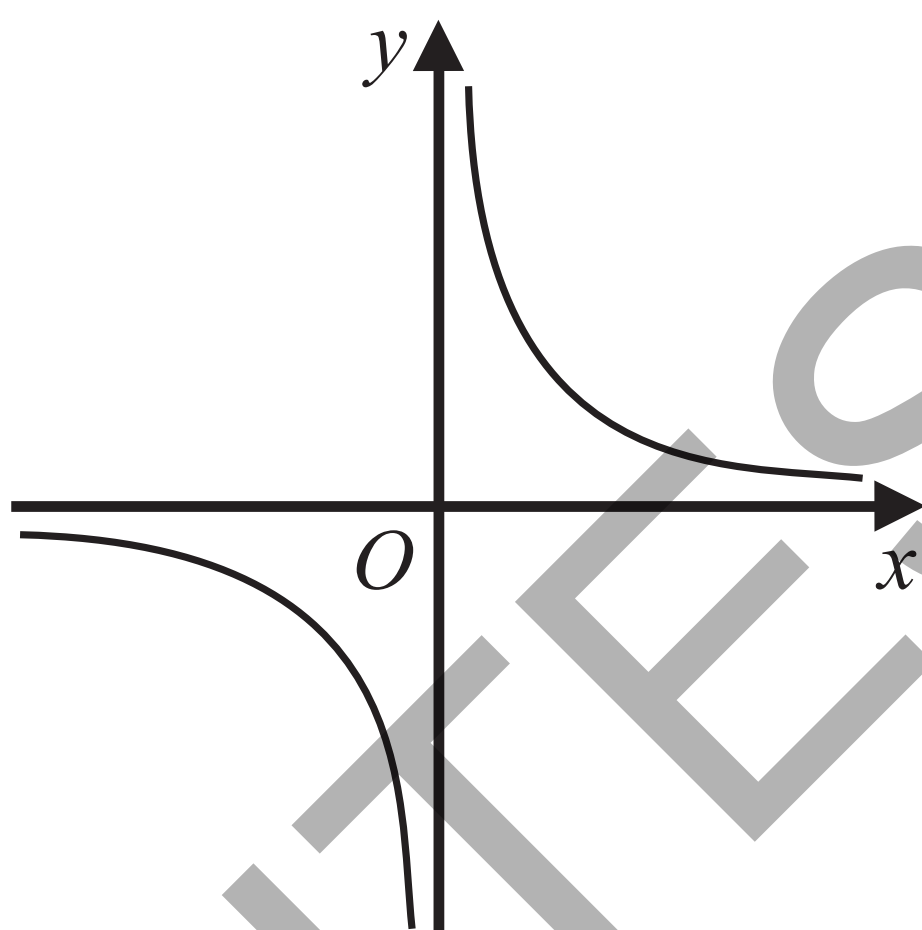
B



C



D



E

NOT TO SCALE

Match the letter of each graph with its equation.

equation	graph
$y = x^2 - 3x$	D
$y = x + 2$	B
$y = x^3 - 1$	C
$y = \frac{1}{x}$	E
$y = 4 - x$	A

[5]

23 The table shows information about the time, in minutes, taken by some students to travel to school.

time (<i>t</i> minutes)	$0 < t \leq 10$	$10 < t \leq 15$	$15 < t \leq 25$	$25 < t \leq 55$
number of students	30	25	20	45

A teacher draws a histogram to show this information.
The height of the bar he draws for the group $0 < t \leq 10$ is 6 cm.

Calculate the height of each of the remaining bars.

STUDYBITES LTD

10 < t ≤ 15:

15 < t ≤ 25:

25 < t ≤ 55:

10

4

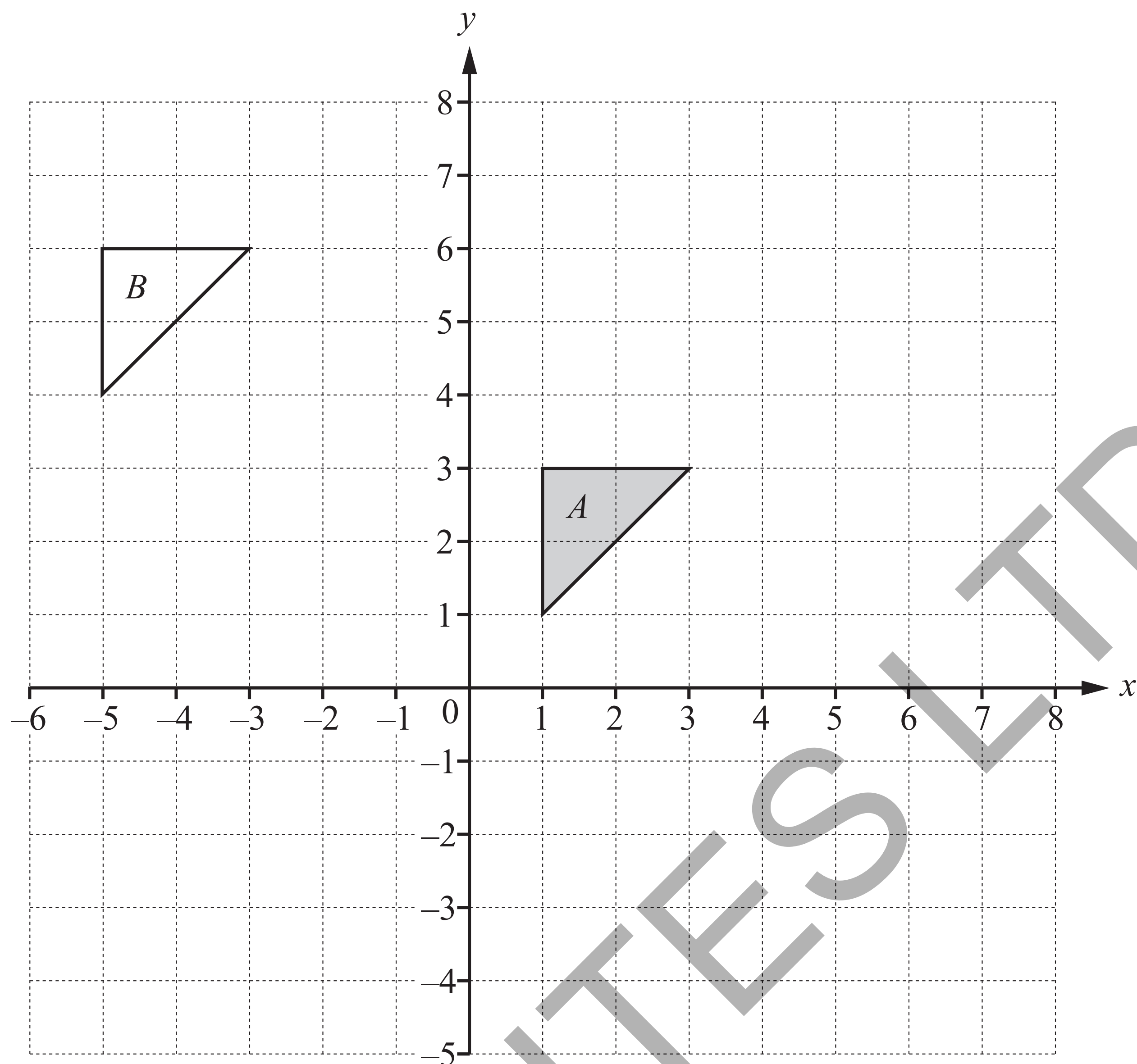
3

cm

cm

cm

[3]



- (a) On the grid, reflect triangle A in the line $y = -1$. [2]
- (b) On the grid, enlarge triangle A by scale factor -1 , centre $(0, 0)$. [2]
- (c) Describe fully the **single** transformation that maps triangle A onto triangle B .

Translation, $(-6, 3)$

25 S is the point $(1, -3)$ and T is the point $(5, k)$.

$$\overrightarrow{PQ} = \begin{pmatrix} 1 \\ 4 \end{pmatrix} \text{ and } \overrightarrow{QR} = \begin{pmatrix} 8 \\ 6 \end{pmatrix}$$

(a) Find $|\overrightarrow{QR}|$.

..... 10 [2]

(b) Express $\overrightarrow{ST}$ as a column vector, in terms of k .

$\begin{pmatrix} k \\ k+3 \end{pmatrix}$ [2]

(c) Find the value of k given that $\overrightarrow{ST}$ is parallel to $\overrightarrow{PQ}$.

..... 13 [3]

- 1 (a) List all the factors of 45.

1, 3, 5, 9, 15, 45 [1]

- (b) Put **one** pair of brackets into each calculation to make it correct.

(i) $5 + 4 \times (8 - 2) = 29$

[1]

(ii) $(24 + 12) \div 3 + 1 = 13$

[1]

- (c) Find

- (i) the reciprocal of 3^{-1} .

3 [1]

- (ii) the value of $12^0 + 12$.

13 [1]

- 2 A train journey starts at 05 43.
It takes 1 hour and 32 minutes.
Find the time the journey finishes.

07 15 [1]

- 3 Simplify.

(a) $x^5 \div \frac{4}{x^5}$

$\frac{x^{10}}{4}$ [1]

(b) $2xy^7 \times 6x^7y^{-7}$

$12x^8$ [2]

(c) $(27x^{15})^{\frac{2}{3}}$

$9x^{10}$ [2]

4 Solve these equations.

(a) $x - 8 = -12$

$x = -4$ [1]

(b) $5(2x + 9) = 10$

$x = -3\frac{1}{2}$ [2]

5 (a) $a = 5b - 2c$

(i) Calculate the value of a when $b = -2$ and $c = -6$.

2 [2]

(ii) Make b the subject of the formula $a = 5b - 2c$.

$b = \frac{a + 2c}{5}$ [2]

(b) Expand the brackets and simplify.

$$5(2x - 2) - (x - 5)$$

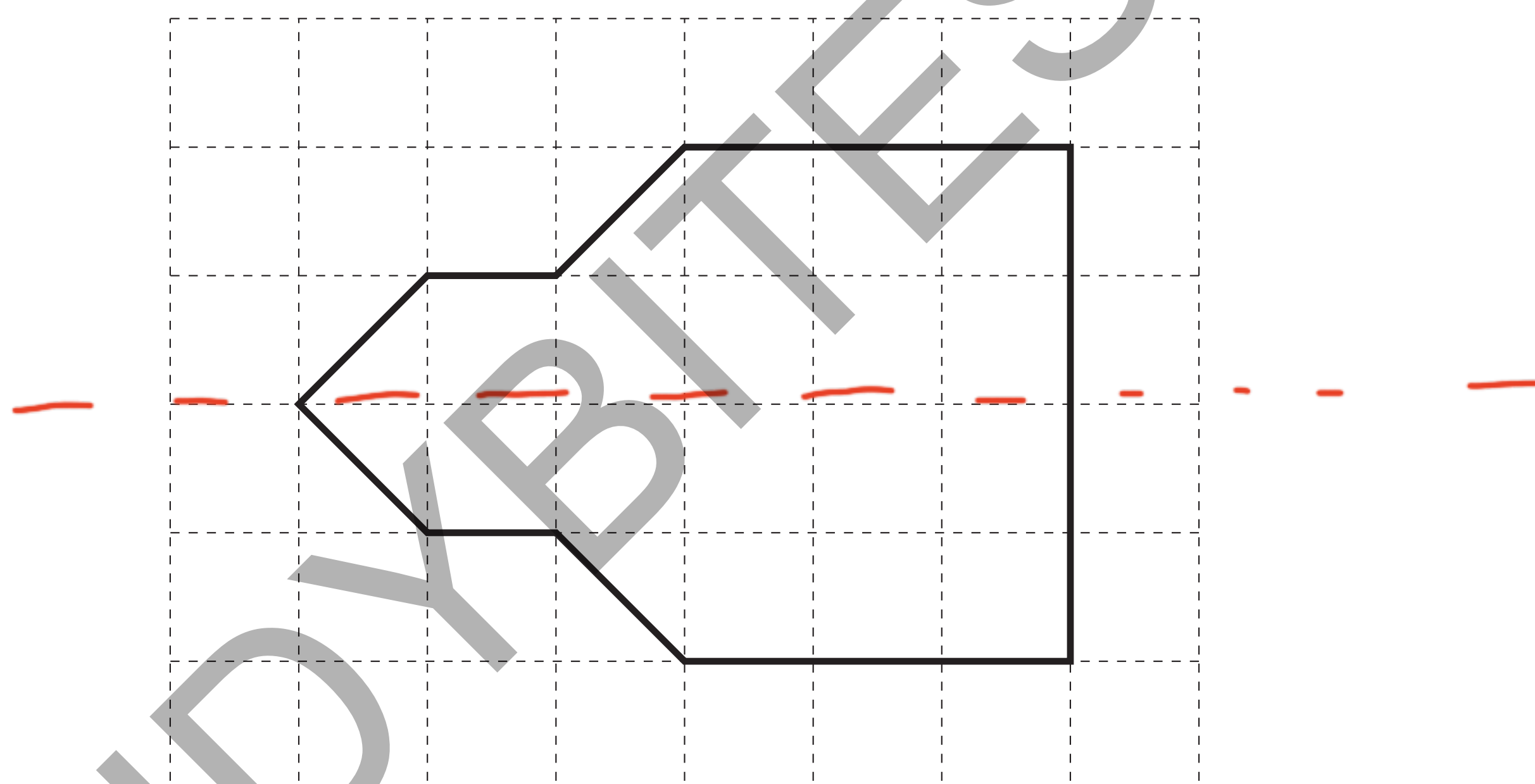
..... $9x - 5$ [2]

(c) Factorise completely.

$$15ab - 20a^2$$

..... $5a(3b - 4a)$ [2]

6 This shape is drawn on a 1cm^2 grid.



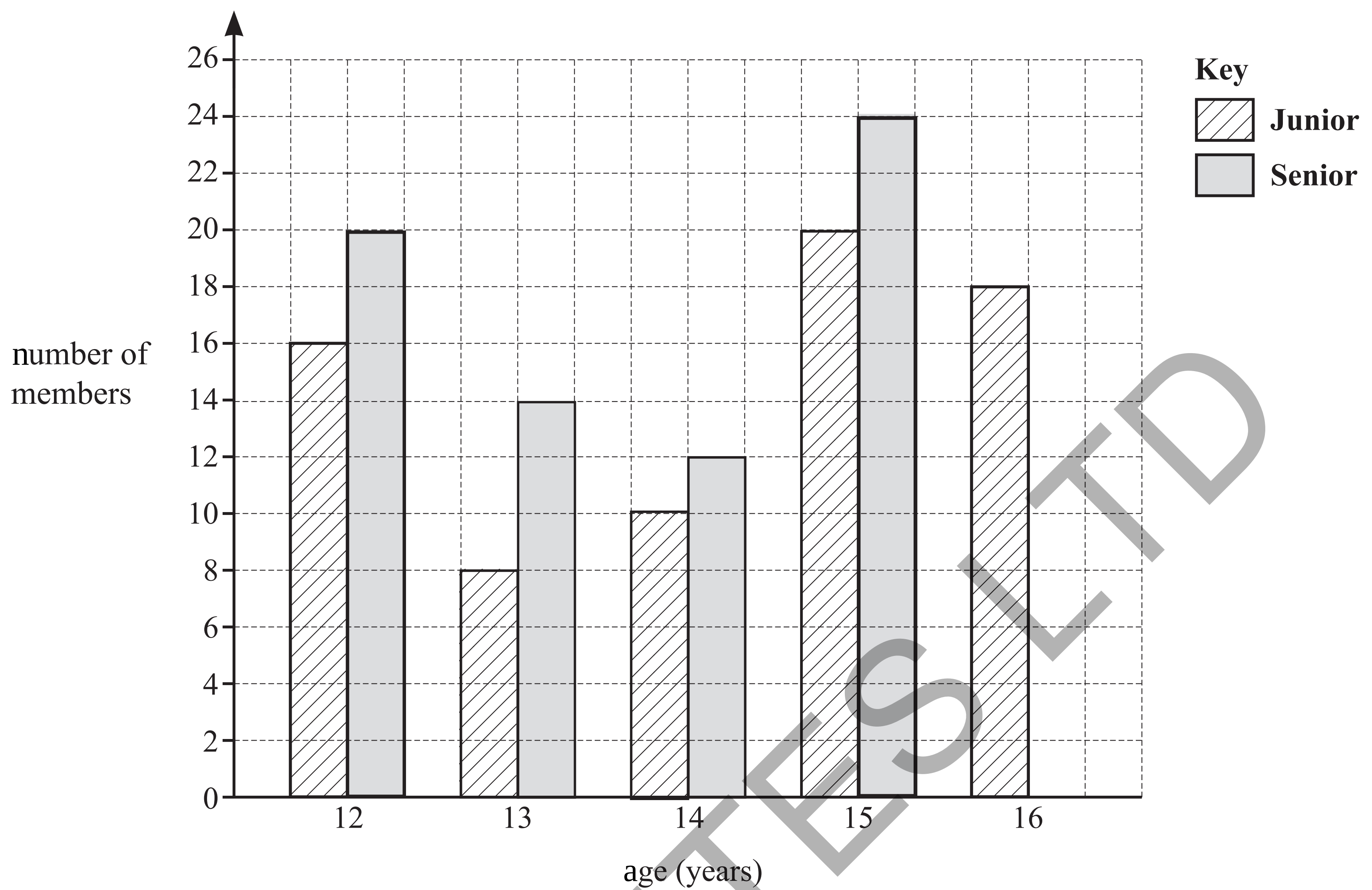
(a) Draw the line of symmetry on this shape.

[1]

(b) Find the area of this shape.

..... 18 cm^2 [2]

7 The bar chart shows the numbers of Juniors and Seniors at a community youth club and their ages.



(a) There are 22 Seniors aged 16 in the community youth club.

Complete the bar chart.

[1]

(b) For members aged 13, work out how many more Seniors than Juniors there are.

6

[1]

(c) Find the total number of members aged 14.

22

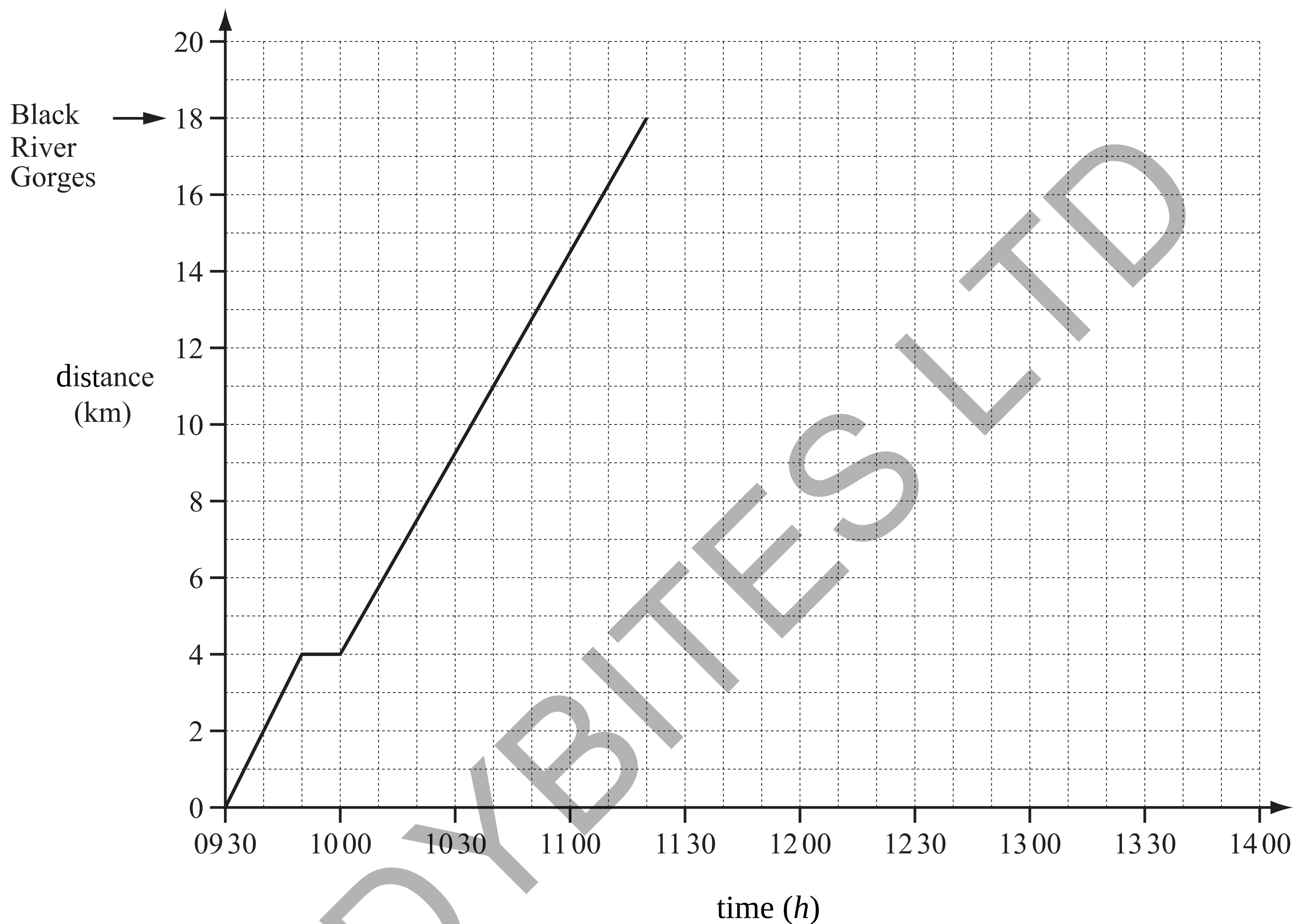
[1]

(d) Find the total number of Juniors in the community youth club .

72

[1]

- 8 Dev leaves his house at 09 30 to cycle to Black River Gorges.
He cycles for 4 km then waits for his friend Kaviraj.
Both boys then cycle to the Black River Gorges.
The travel graph shows Dev's journey.



- (a) Write down how long Dev waits for Kaviraj.

..... 10 min [1]

- (b) State the exact time Dev and Kaviraj arrive at the Black River Gorges.

..... 11 20 [1]

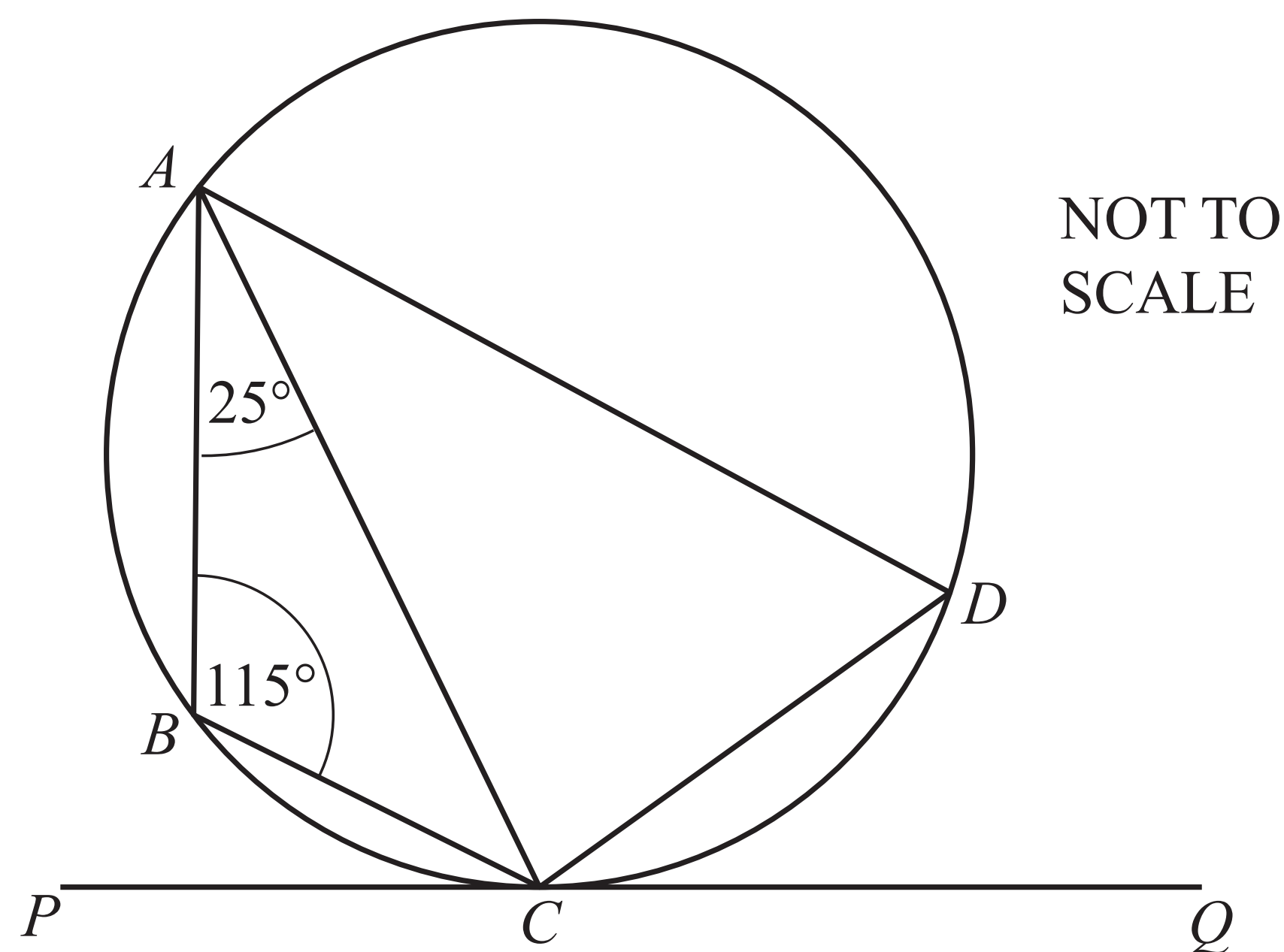
- (c) The boys spent 40 minutes at the Black River Gorges.

They then cycle back at a constant speed arriving home at 13 30.

On the grid, complete the travel graph to show their return journey.

[2]

9



The points A , B , C and D lie on a circle.

PCQ is a tangent to the circle at C .

Angle $ABC = 115^\circ$ and angle $BAC = 25^\circ$.

Find

(a) angle ADC

65 $^\circ$ [1]

(b) angle ACP

65 $^\circ$ [1]

(c) angle PCB .

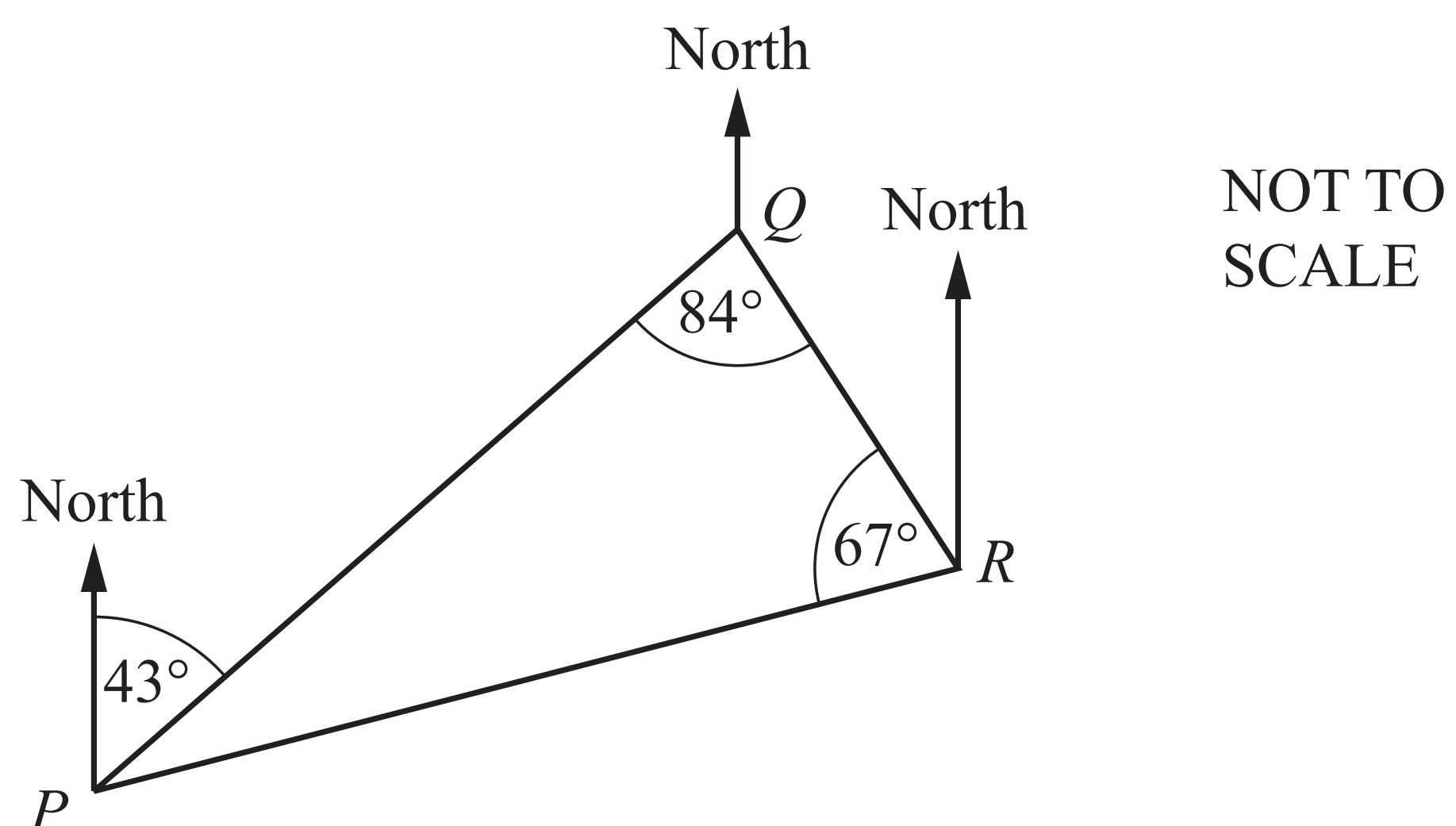
25 $^\circ$ [1]

10 Write $0.5\overline{81}$ as a fraction.

You must show all your working and give your answer in its simplest form.

$\frac{32}{55}$ [3]

11



(a) Find angle RPQ .

..... 29° [1]

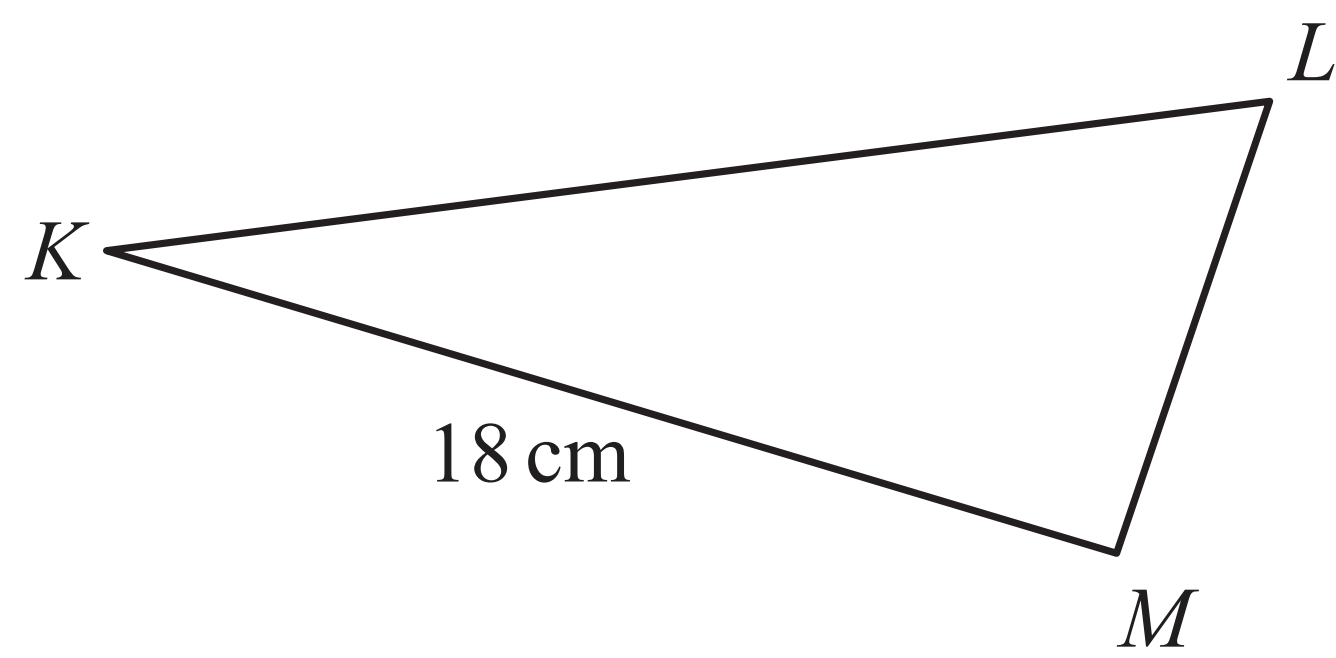
(b) Find the bearing of port P from port R .

..... 252° [2]

12 A cube has a volume of 64 m^3 .
Work out the total surface area of the cube.

..... 96 m^2 [3]

13



NOT TO SCALE

In triangle KLM ,

$$KM = 18 \text{ cm}$$

$$\sin K = 0.4$$

$$\sin L = 0.9$$

Calculate the length of LM .

8

.....cm [3]

- 14 By writing each number in the calculation correct to 1 significant figure, work out an estimate for the value of

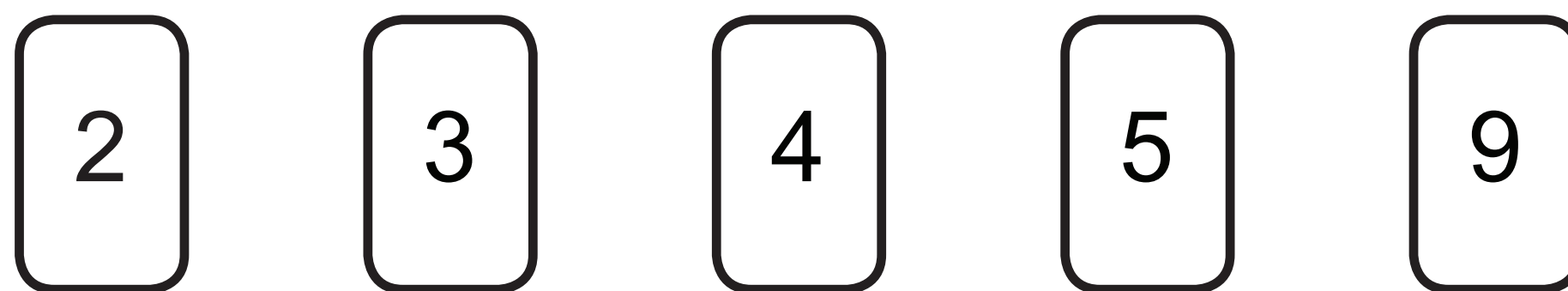
$$\frac{31.2 \times 3.84}{0.189 + 0.44}$$

You must show all your working.

200

..... [3]

15 Here are five number cards.



Place two cards side-by-side to show

(a) a two-digit multiple of 6



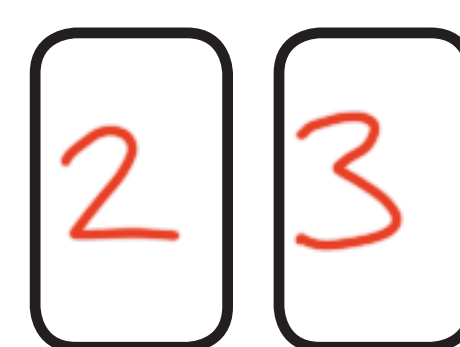
[1]

(b) a two-digit square number



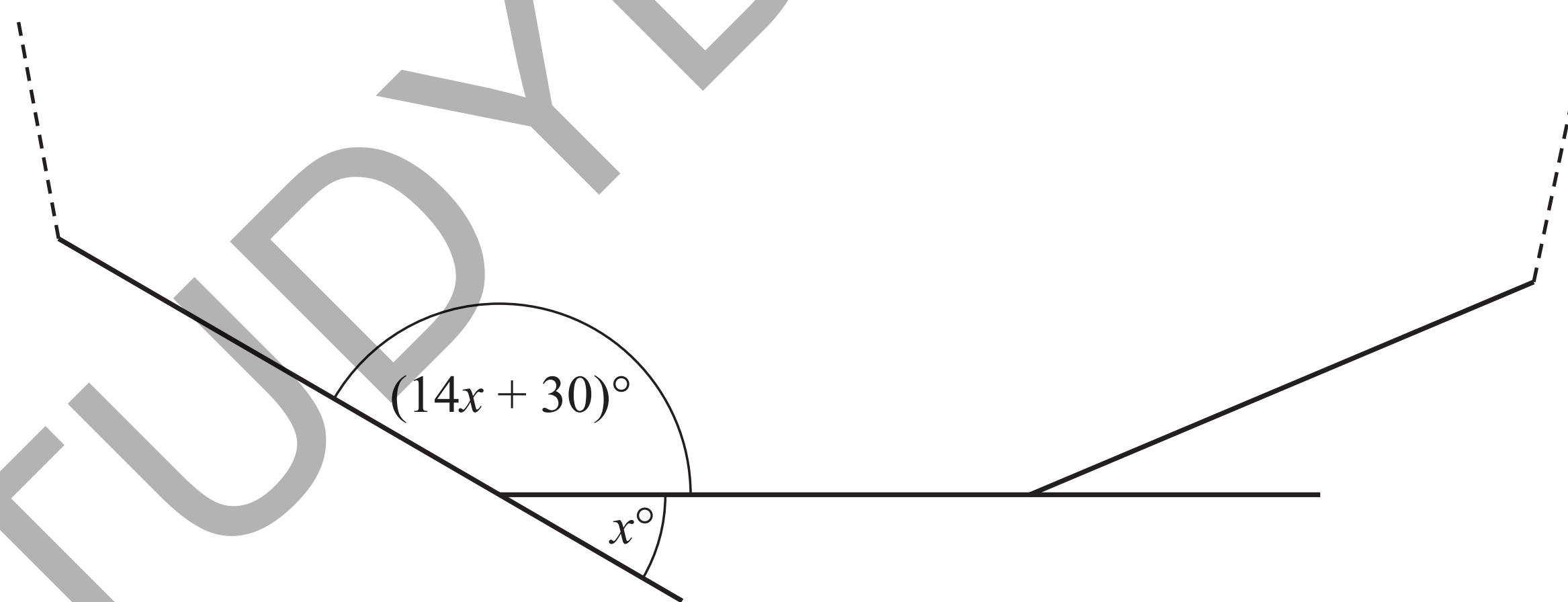
[1]

(c) a two-digit prime number.



[1]

16



NOT TO
SCALE

The diagram shows part of a regular polygon.

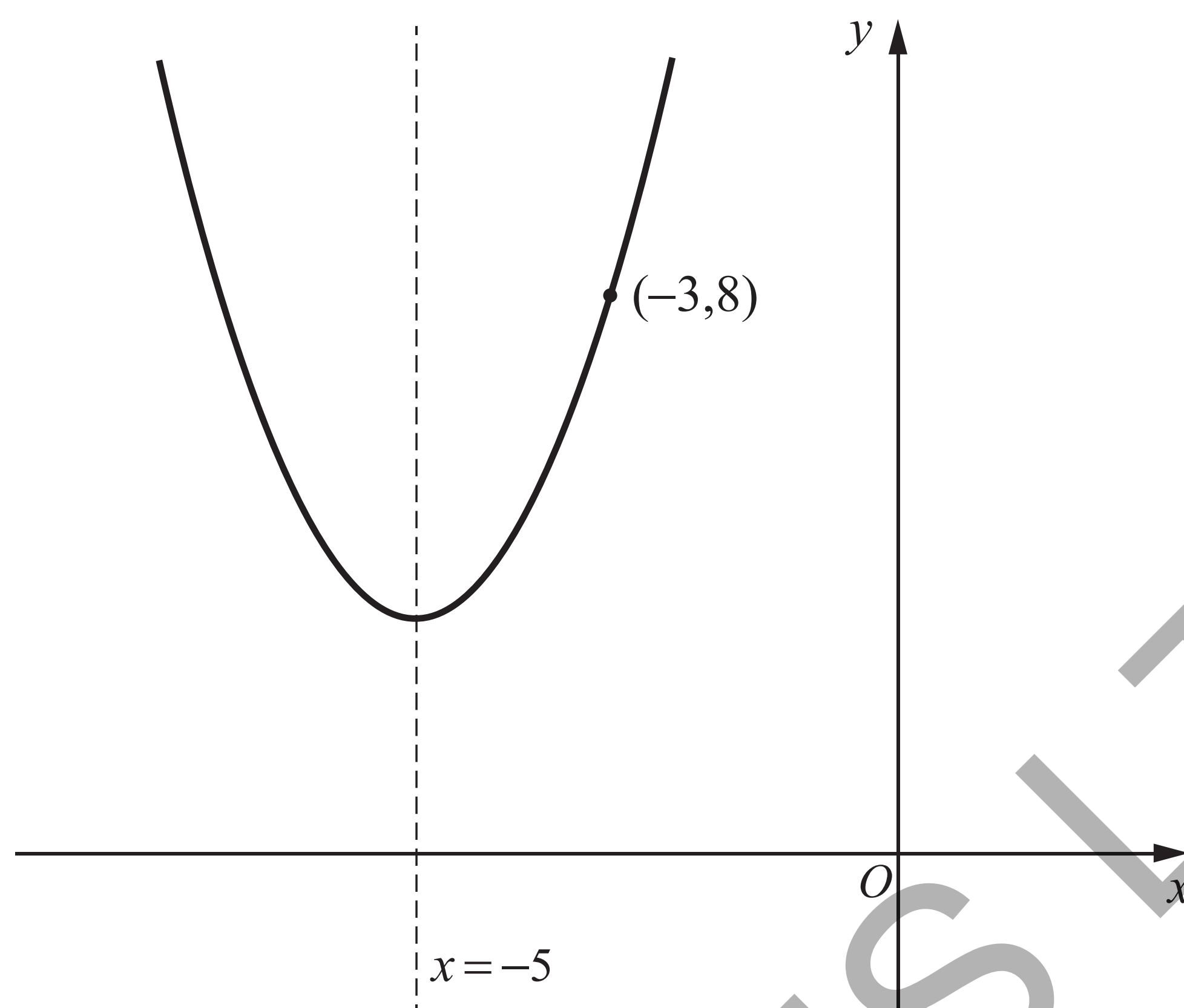
The interior angle is $(14x + 30)^\circ$ and the exterior angle is x° .

Work out the number of sides of the polygon.

36

[4]

- 17 The graph below shows a parabola with equation of the form $y = (x + a)^2 + b$.



The equation of the axis of symmetry of the parabola is $x = -5$.

- (a) State the value of a .

..... 5 [1]

The point $(-3, 8)$ lies on the parabola.

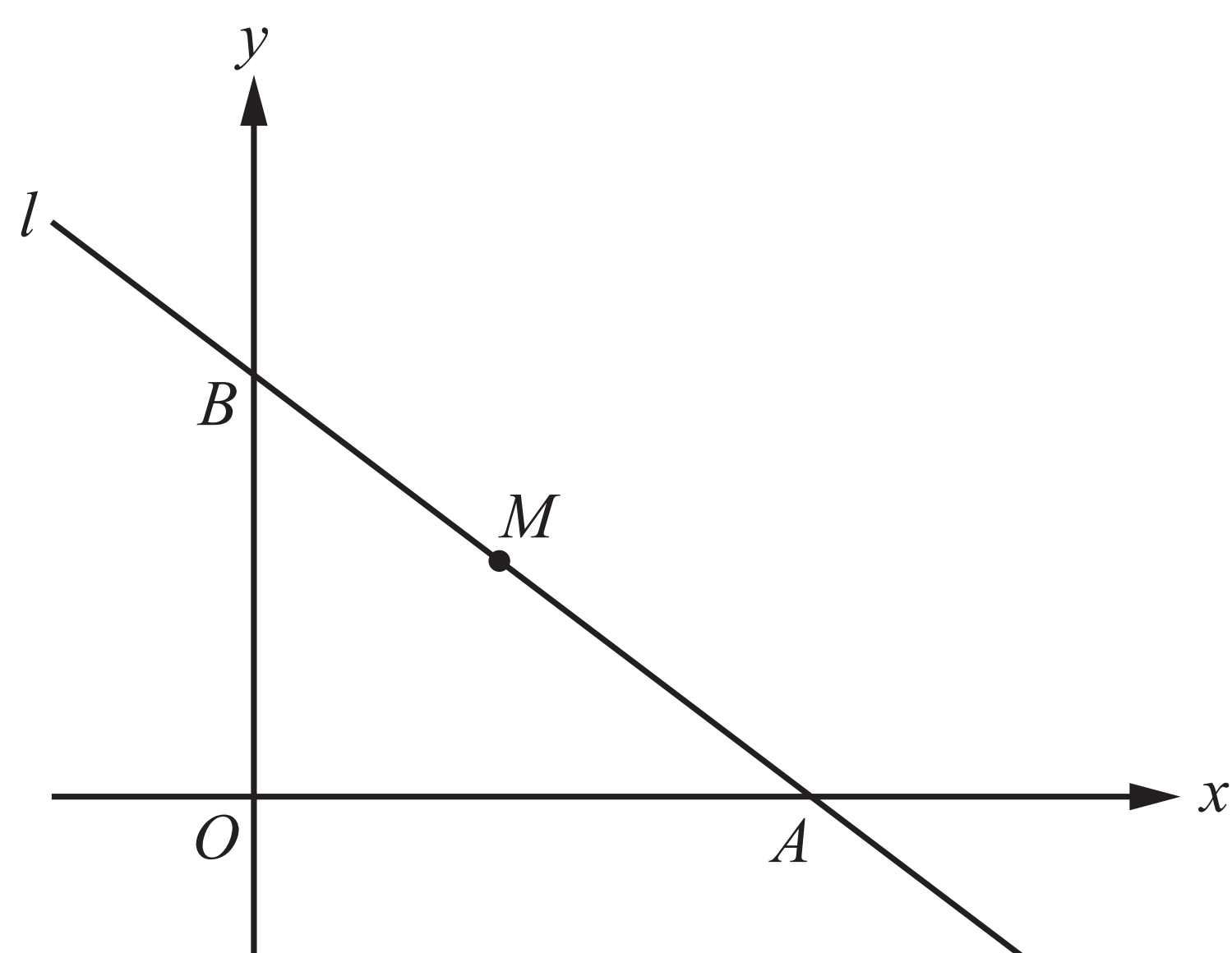
- (b) Calculate the value of b .

..... 4 [1]

- (c) Find the coordinates of the turning point.

(..... -5 , ... 4) [1]

18

NOT TO
SCALE

The equation of the line l is $4x + 3y = 24$.

The line cuts the x -axis at A and the y -axis at B . The midpoint of AB is M .

(a) Find the coordinates of

(i) A

(6 , 0) [1]

(ii) B

(0 , 8) [1]

(iii) M

(3 , 4) [2]

(b) Find the equation of the line through the origin which is perpendicular to the line l .

$y = \frac{3}{4}x$ [3]

- 19 In this question, give all your answers as fractions.



The letters of the word **METHOD** are printed on 6 cards.

- (a) A card is chosen at random.

Write down the probability that

- (i) it has the letter **H** printed on it,

$\frac{1}{6}$ [1]

- (ii) it does not have the letter **M** printed on it,

$\frac{5}{6}$ [1]

- (iii) the letter printed on it has one line of symmetry.

$\frac{2}{3}$ [1]

- (b) Fara chooses a card at random, replaces it, then chooses a card again.

Calculate the probability that only **one** of the cards she chooses has the letter **E** printed on it.

$\frac{5}{18}$ [3]

20

$$f(x) = 4x - 3$$

$$g(x) = (x - 2)^2$$

(a) Find $fg((5))$.

(b) Solve $g(x) = 36$.

(c) Find $f^{-1}(9)$.

(d) Write down $f(f^{-1}(x))$.

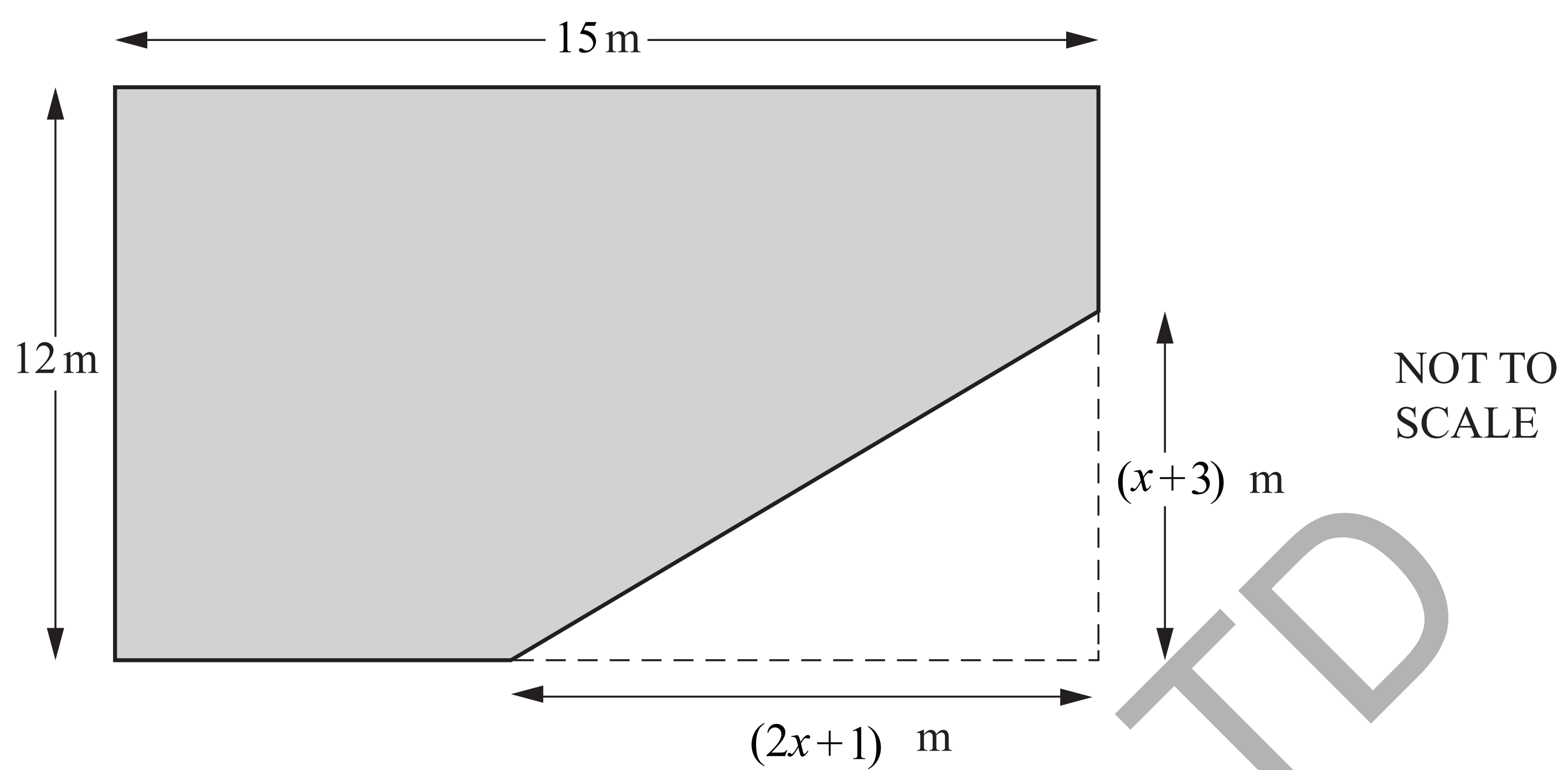
..... ³³ [2]

$x =$ ⁸ or $x =$ ⁻⁴ [2]

..... ³ [2]

..... ^x [1]

21



The diagram shows a rectangle with a triangular corner cut off.

The total area of the shaded region is 159 m^2 .

(a) Show that $2x^2 + 7x - 39 = 0$.

(b) Solve the equation $2x^2 + 7x - 39 = 0$.

[5]

$$x = \dots 3 \dots \text{ or } x = \dots -6\frac{1}{2} \dots [3]$$

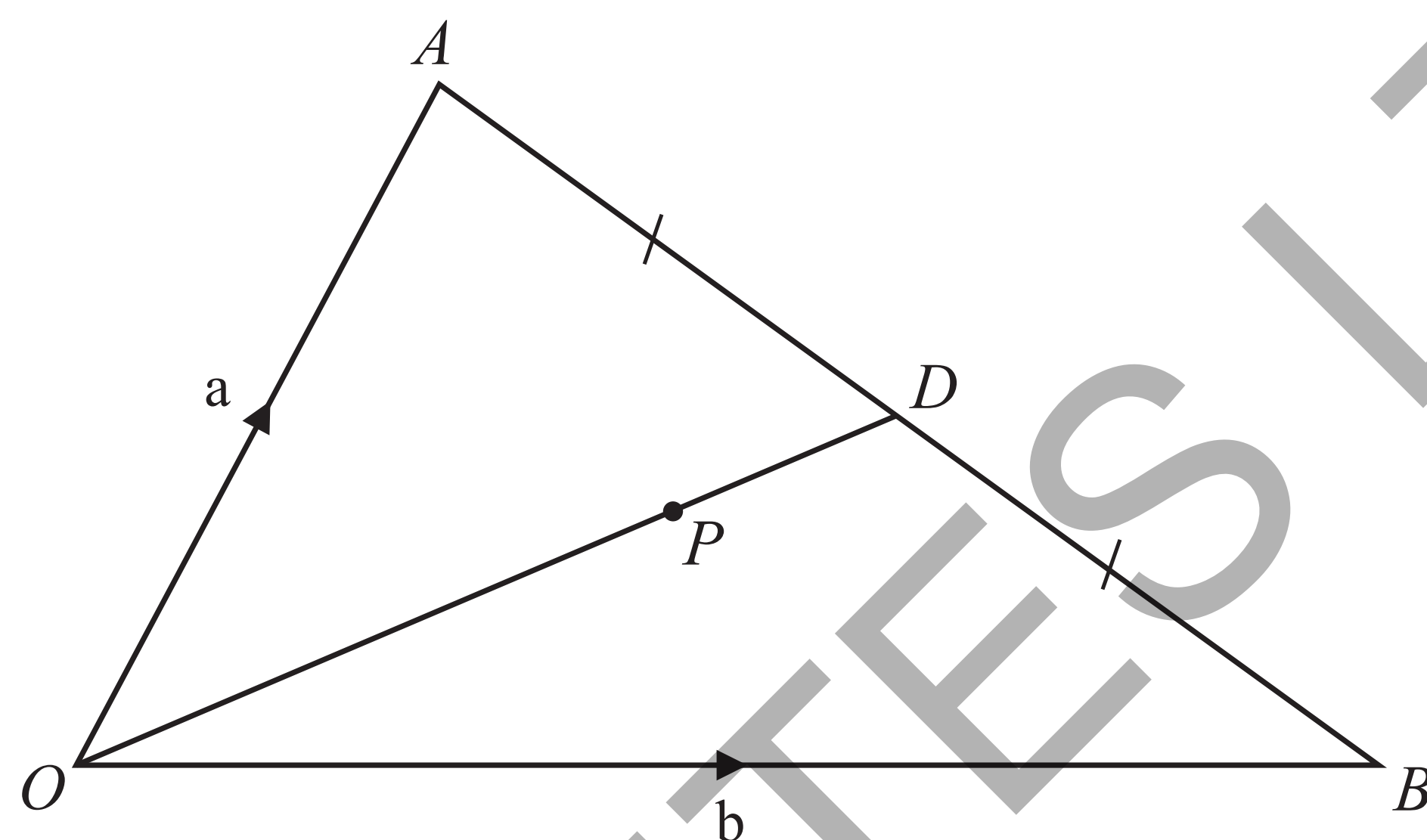
22 (a)

$$\mathbf{a} = \begin{pmatrix} -3 \\ 4 \end{pmatrix}$$

Work out $|\mathbf{a}|$.

..... [2]

(b)



NOT TO SCALE

$$\vec{OA} = \mathbf{a} \text{ and } \vec{OB} = \mathbf{b}.$$

D is the midpoint of AB and $\vec{OP} = \frac{3}{4}\vec{OD}$.

(i) Find $\vec{AB}$ in terms of $\mathbf{a}$ and $\mathbf{b}$.

..... [1]

(ii) Find $\vec{OD}$ in terms of $\mathbf{a}$ and $\mathbf{b}$.

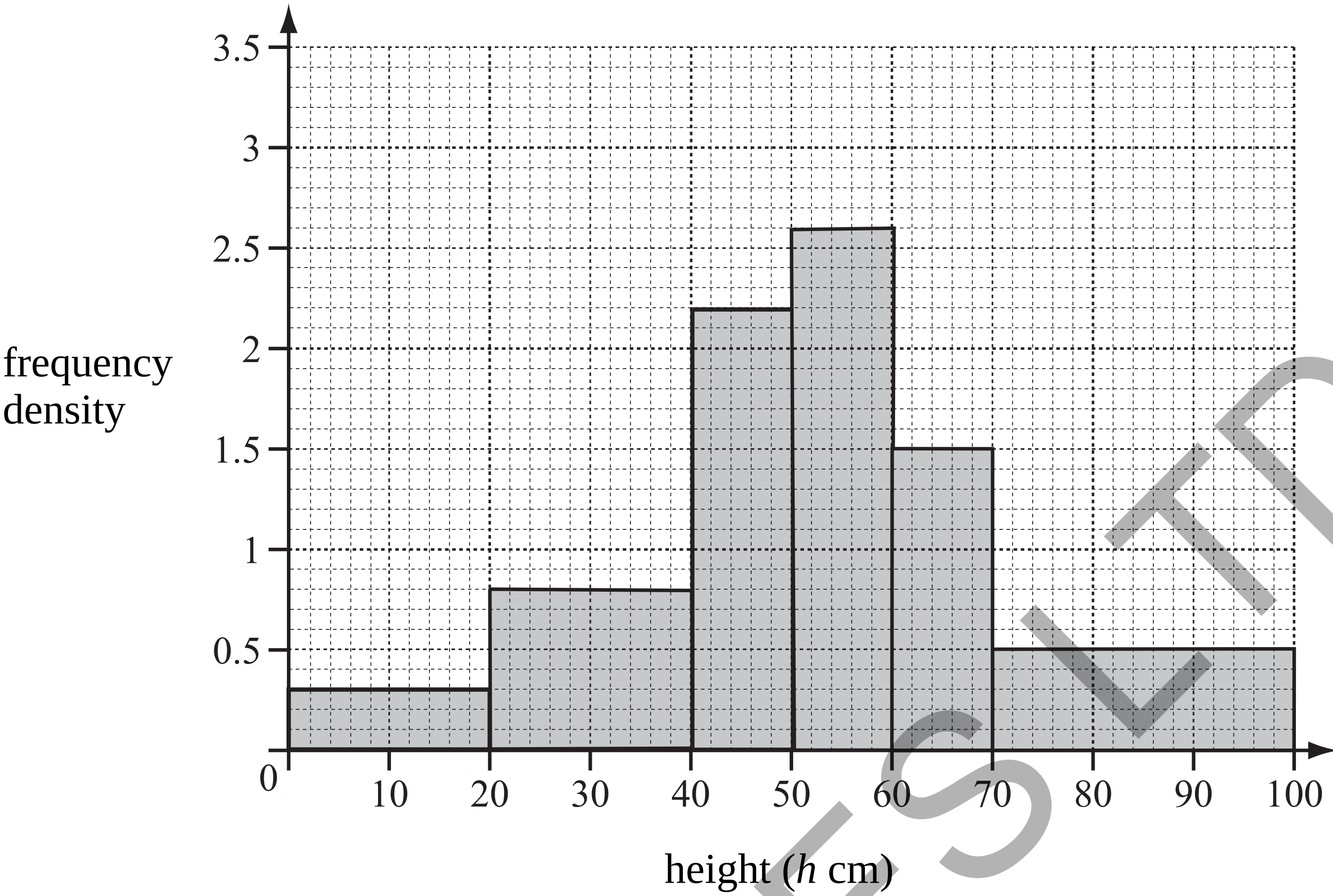
Write your answer as simply as possible.

..... [1]

(iii) Find $\vec{OP}$ in terms of $\mathbf{a}$ and $\mathbf{b}$.

..... [2]

- 23 The heights, h cm, of 100 plants in a sample were recorded.
The histogram shows the heights of the plants.



(a) Complete the frequency table using the information in the histogram.

height (h cm)	$0 < h \leq 20$	$20 < h \leq 40$	$40 < h \leq 50$	$50 < h \leq 60$	$60 < h \leq 70$	$70 < h \leq 100$
frequency	6	16	22	26	15	15

[3]

(b) Complete the cumulative frequency table for the heights of these plants.

height (h cm)	$h \leq 20$	$h \leq 40$	$h \leq 50$	$h \leq 60$	$h \leq 70$	$h \leq 100$
cumulative frequency	6	22	44	70	85	100

[2]

Exam 6 - Paper 1

- 1 (a) Work out.

$$10 - 2 \times 3$$

..... 4 [1]

- (b) Convert 0.5 metres to millimetres.

..... 500 mm [1]

- (c) Write 12 hours as a fraction of a day.

..... $\frac{1}{2}$ [1]

- 2 Three brothers share \$
- n
- in the ratio 7 : 4 : 3.

The smallest share is \$150.

Find the value of n .

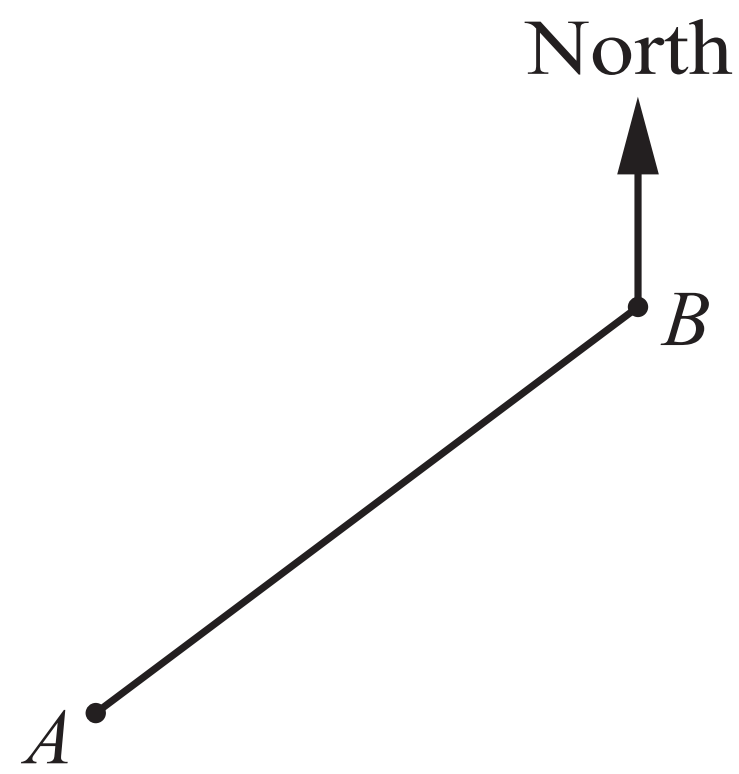
$n =$ 700 [3]

- 3
- 8.742×10^{-2}
- 4.1×10^2
- 2.36×10^1
- 5.9×10^{-2}

Write these numbers in order, starting with the smallest.

5.9×10^{-2} < 8.742×10^{-2} < 2.36×10^1 < 4.1×10^2 [2]
smallest

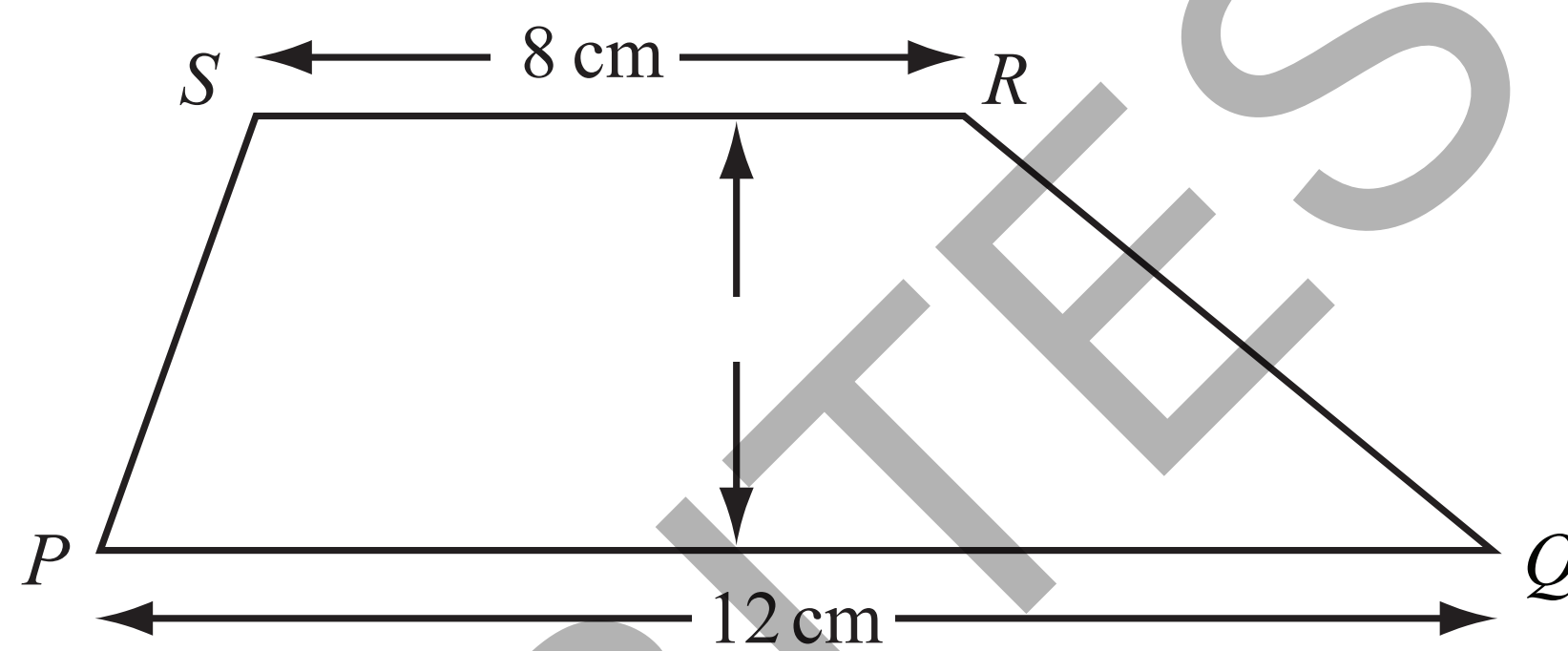
4

NOT TO
SCALE

The bearing of A from B is 227° .

Find the bearing of B from A .

5

NOT TO
SCALE

PQ is parallel to RS .

PQ is 12 cm and RS is 8 cm.

The area of the quadrilateral is 42 cm^2 .

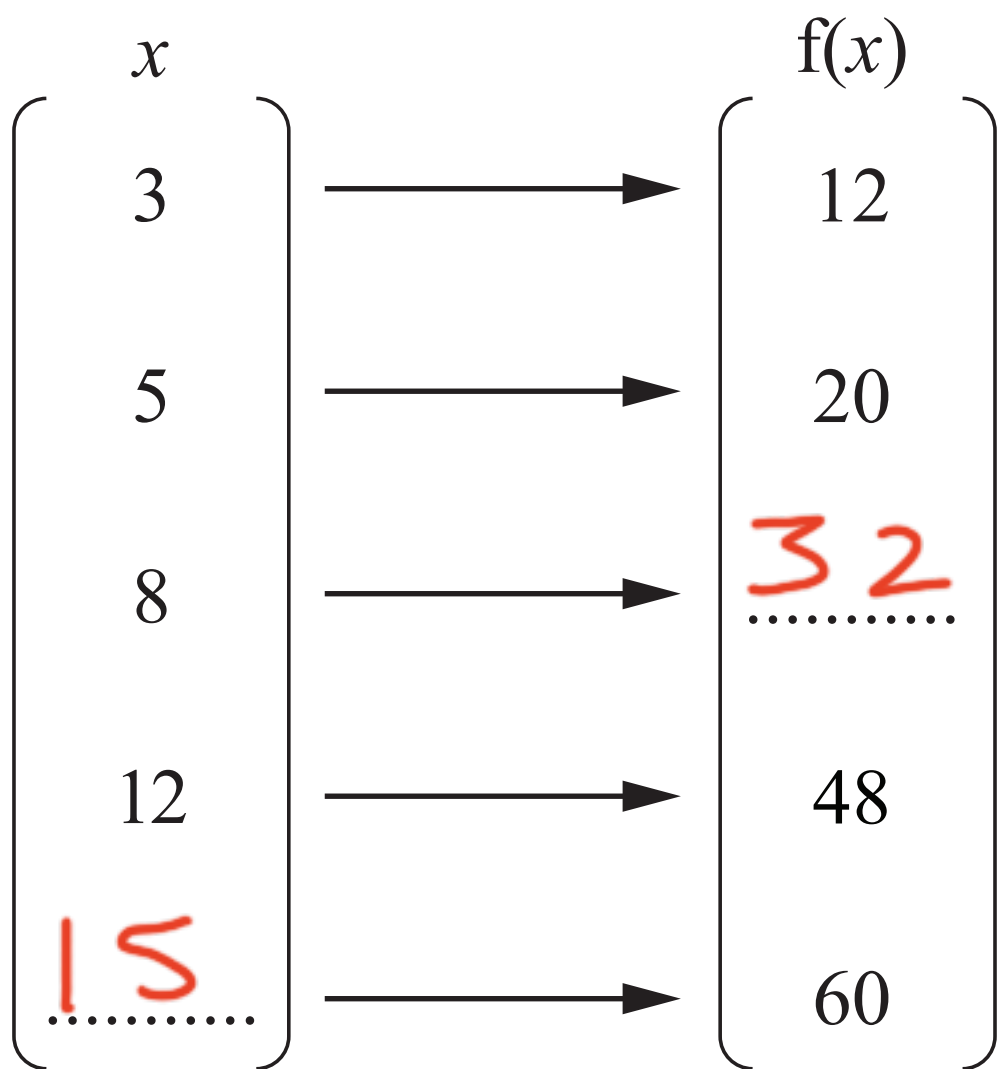
(a) Write down the mathematical name for the quadrilateral $PQRS$.

Trapezium [1]

(b) Calculate the perpendicular height of the quadrilateral.

4.2 cm [2]

6 (a) Complete the mapping diagram.



[2]

(b) $g(x) = 4x - 3$

Find the value of x when $g(x) = 17$.

$x = 5$ [2]

7 (a) $t^x \times t^2 = t^{10}$

Find the value of x .

$x = 8$ [1]

(b) Simplify.

(i) $\left(\frac{4}{x}\right)^{-2}$

$\frac{x^2}{16}$ [1]

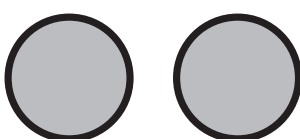
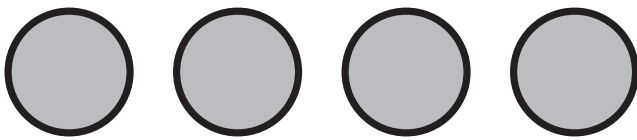
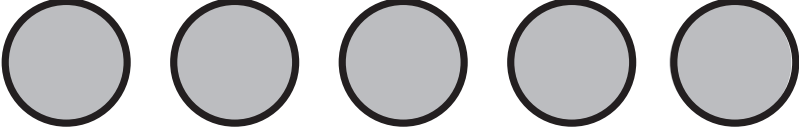
(ii) $a^3b^7 \div a^6b^2$

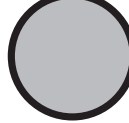
$\frac{b^5}{a^3}$ [1]

8 A farmer recorded the number of eggs collected daily from a small chicken house over a period of 50 days.

The pictogram shows some information about the daily egg counts.

There were no eggs collected on 4 of the days.

<i>number of eggs</i>	<i>number of days</i>
0	
1	
2	
3	
4	
5	
6	

Key:  : 2 days

(a) (i) Complete the key. [1]

(ii) There were 3 eggs collected on each of 14 days.

Complete the pictogram. [1]

(b) (i) Write down the modal number of eggs collected.

.....3..... [1]

(ii) Find the median number of eggs collected.

.....3..... [1]

(iii) Find the range.

.....6..... [1]

(iv) One of the 50 days is chosen at random.

Work out the probability that the farmer collected at least 4 eggs on that day .

..... $\frac{7}{25}$ [2]

- 9 (a) These are the first four terms of a sequence.

5 12 19 26

Find the n th term of this sequence.

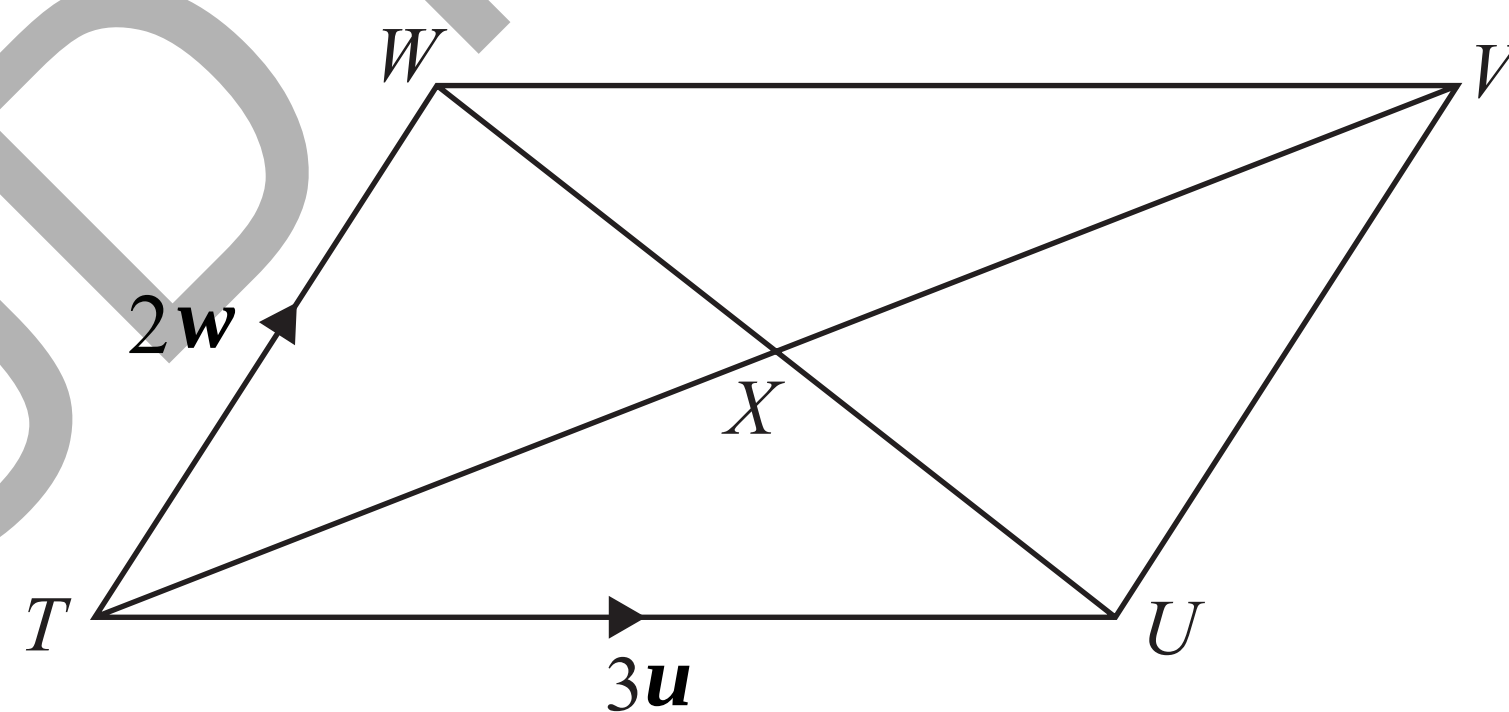
..... $7n - 2$ [2]

- (b) The n th term of a different sequence is $n^2 + 4$.

Find the first three terms of this sequence.

..... 5 , ... 8 , ... 13 [2]

10



NOT TO
SCALE

$TUVW$ is a parallelogram with diagonals TV and UW intersecting at X .

$\overrightarrow{TU} = 3\mathbf{u}$ and $\overrightarrow{TW} = 2\mathbf{w}$.

Find $\overrightarrow{TX}$ in terms of $\mathbf{u}$ and $\mathbf{w}$.

Give your answer in its simplest form.

$\overrightarrow{TX} = \dots \frac{3\mathbf{u}}{2} + \mathbf{w} \dots$ [2]

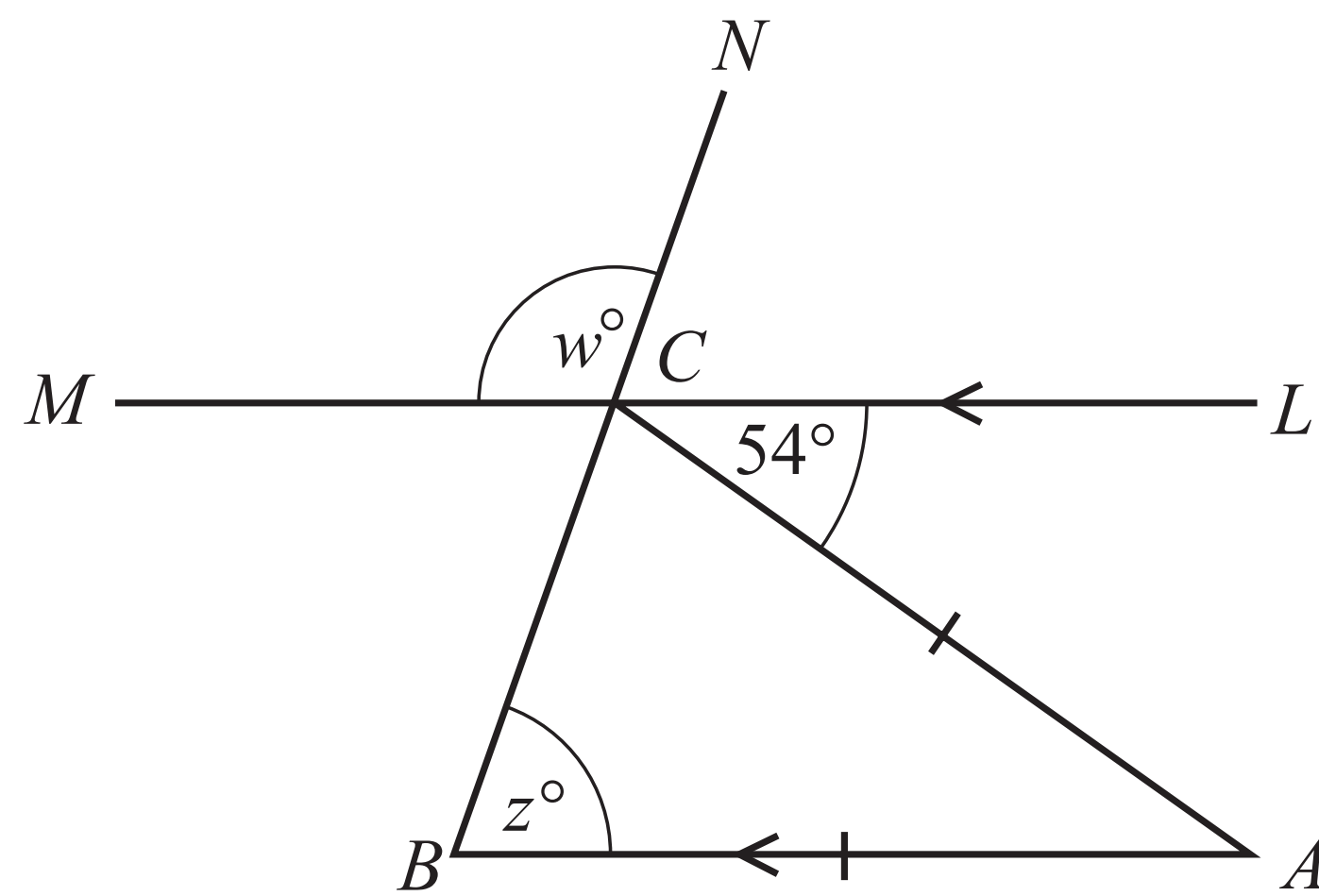
- 11 Solve the simultaneous equations.
You must show all your working.

$$\begin{aligned}3x - \frac{1}{2}y &= 11 \\ 2x - y &= 2\end{aligned}$$

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$$\begin{aligned}x &= \dots\dots\dots 5 \\ y &= \dots\dots\dots 8 \quad [3]\end{aligned}$$

12

NOT TO
SCALE

The diagram shows an isosceles triangle ABC with $AB = AC$.
 LCM and BCN are straight lines and LCM is parallel to AB .
 Angle $ACL = 54^\circ$.

Find the value of w and the value of z .

$$w = \dots\dots\dots 117 \dots\dots\dots$$

$$z = \dots\dots\dots 63 \dots\dots\dots [3]$$

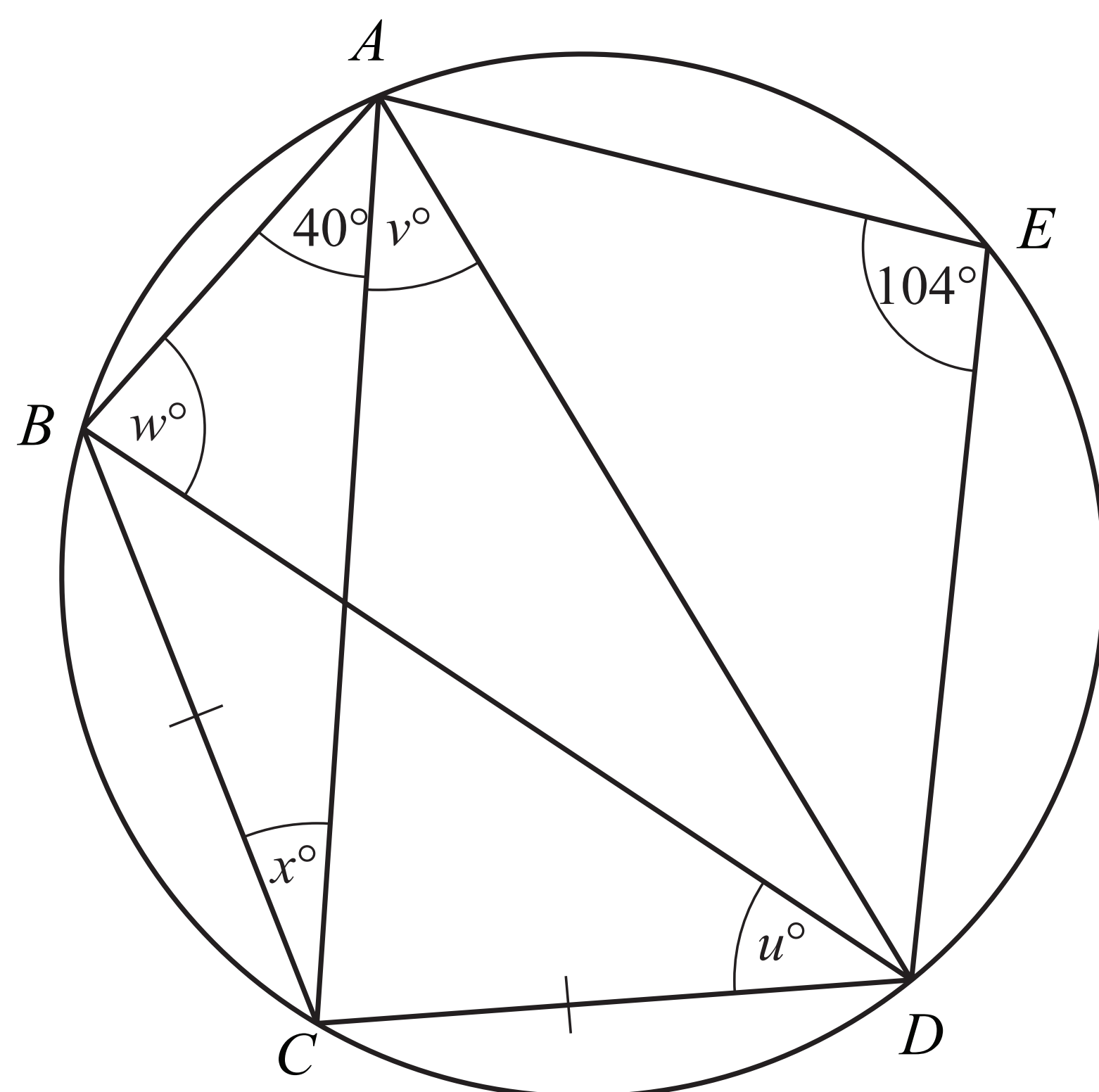
13 Work out.

$$1\frac{7}{8} \div 3\frac{3}{4}$$

Write your answer as a fraction in its simplest form.

$$\dots\dots\dots \frac{1}{2} \dots\dots\dots [3]$$

14

NOT TO
SCALE

A, B, C, D and E lie on the circle.

Angle $AED = 104^\circ$ and angle $BAC = 40^\circ$.

$BC = CD$.

Find the value of

(a) u ,

..... 40 [1]

(b) v ,

..... 40 [1]

(c) w ,

..... 76 [1]

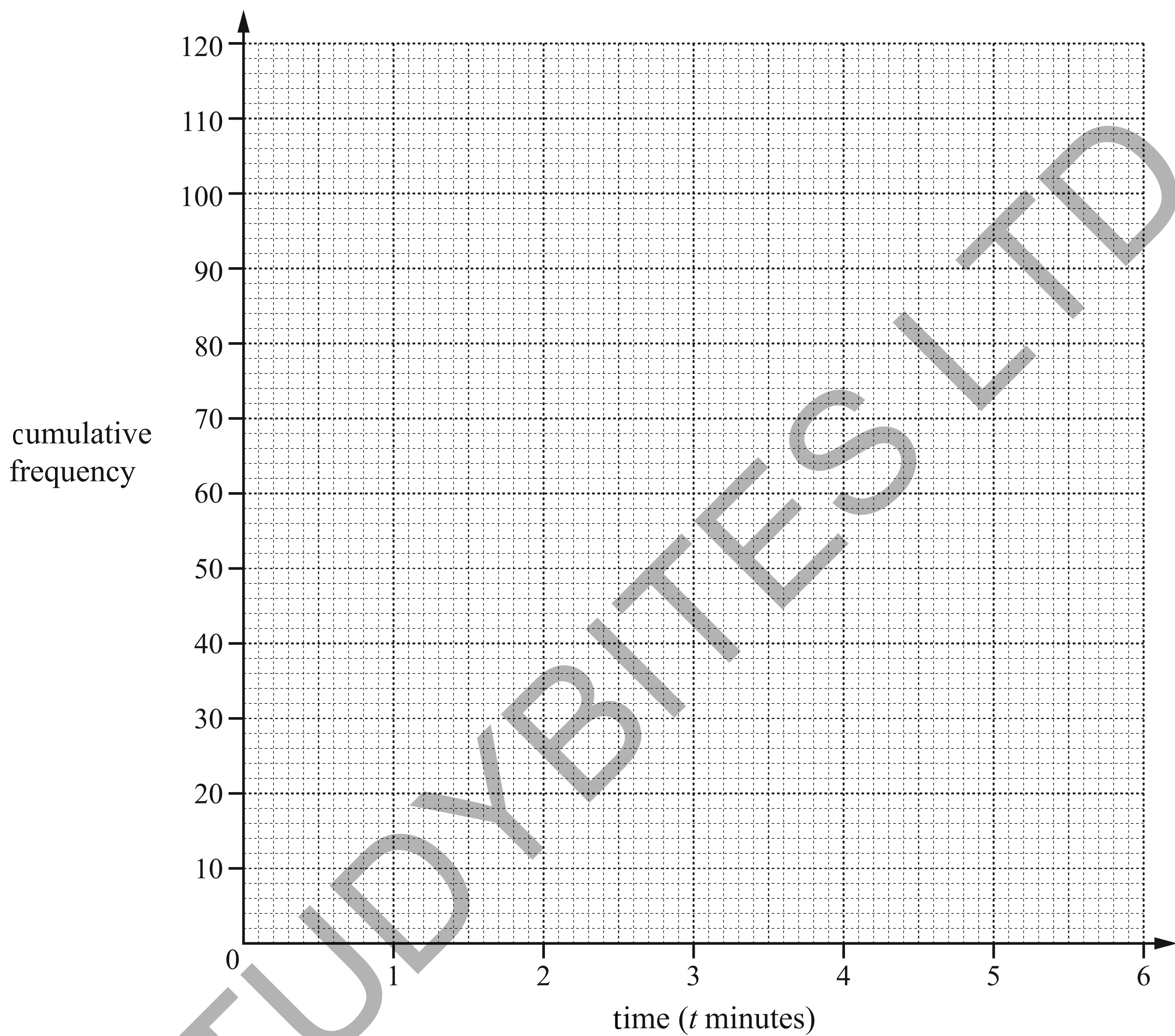
(d) x .

..... 24 [1]

- 15 The cumulative frequency table shows the time taken, t minutes, for 120 customer service calls.

time (t minutes)	$t \leq 1$	$t \leq 2$	$t \leq 3$	$t \leq 4$	$t \leq 5$	$t \leq 6$
cumulative frequency	8	30	70	102	116	120

- (a) Draw a cumulative frequency diagram to show the time taken.



[3]

- (b) Use your cumulative frequency diagram to find

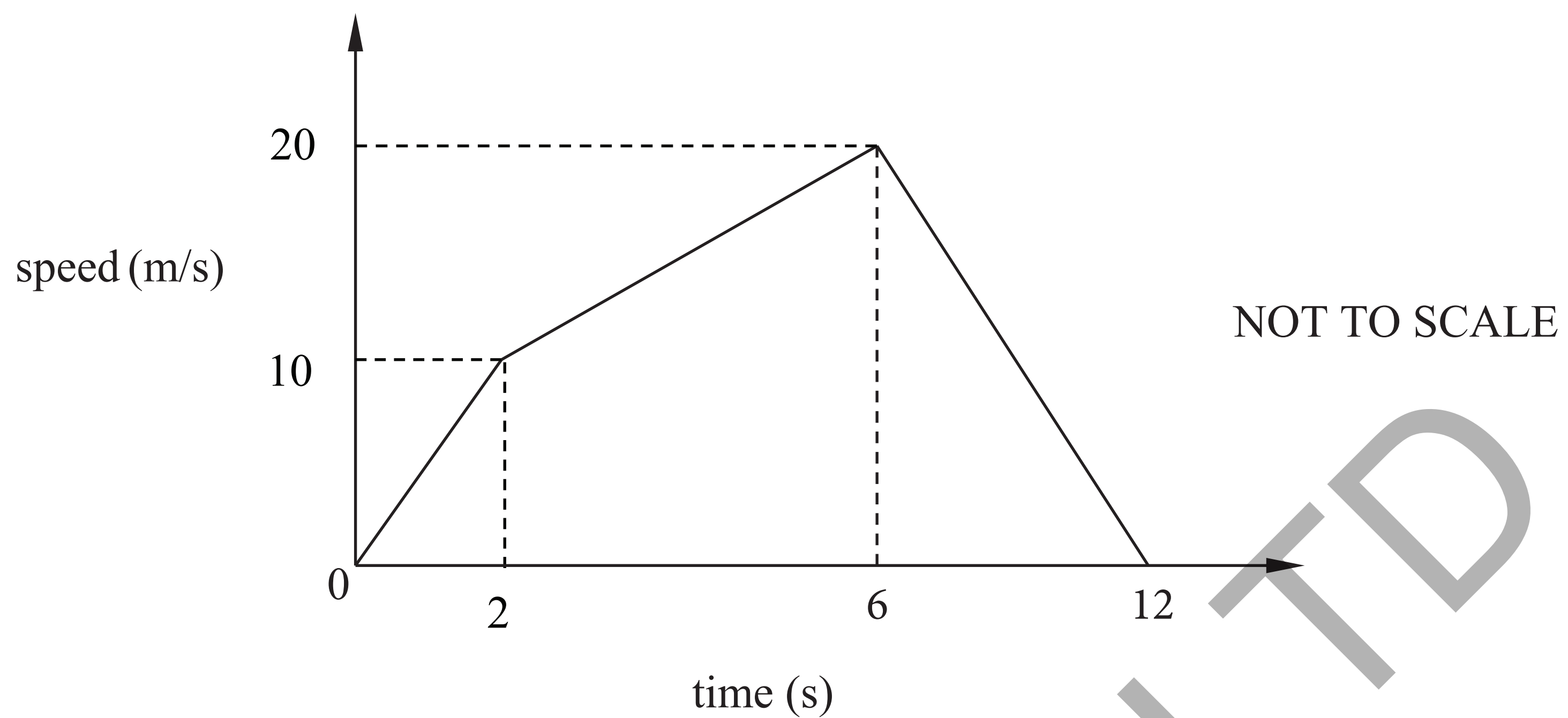
- (i) the median,

..... **2.8** min [1]

- (ii) the interquartile range.

..... **1.5** min [2]

- 16 The diagram shows the speed-time graph of a particle during a period of 12 seconds.



- (a) Find the acceleration of the particle during the first 2 seconds.

..... 5 m/s² [1]

- (b) Calculate the average speed for the last 10 seconds.

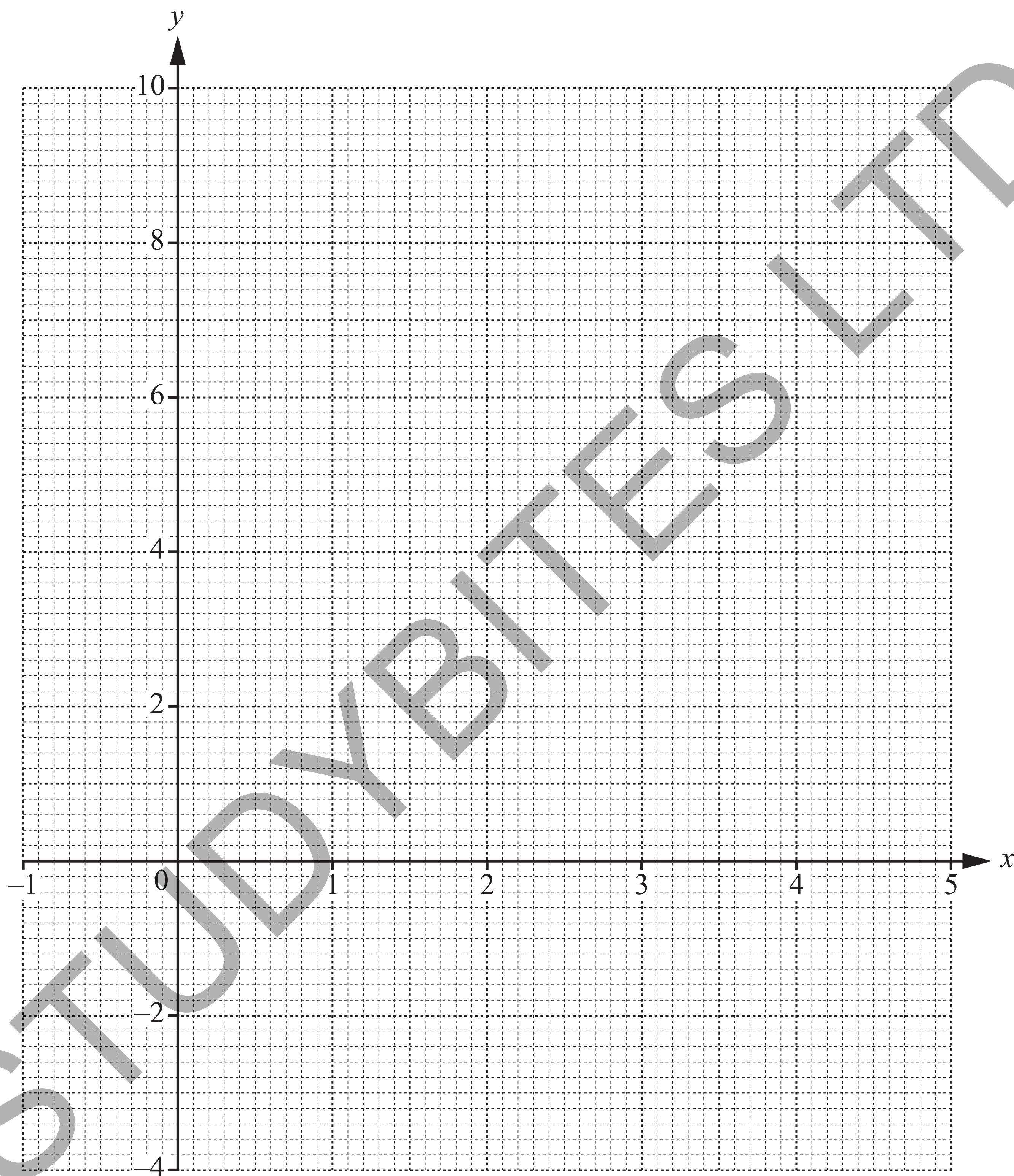
..... 12 m/s [3]

- 17 (a) Complete the table of values for $y = x^2 - 5x + 4$.

x	-1	0	1	2	3	4	5
y	10	4	0	-2	-2	0	4

[2]

- (b) On the grid, draw the graph of $y = x^2 - 5x + 4$ for $-1 \leq x \leq 5$.



[4]

- (c) On the grid, draw a suitable straight line to solve the equation $x^2 - 6x + 6 = 0$. [2]

- (d) Use your graph to solve the equation $x^2 - 6x + 6 = 0$.

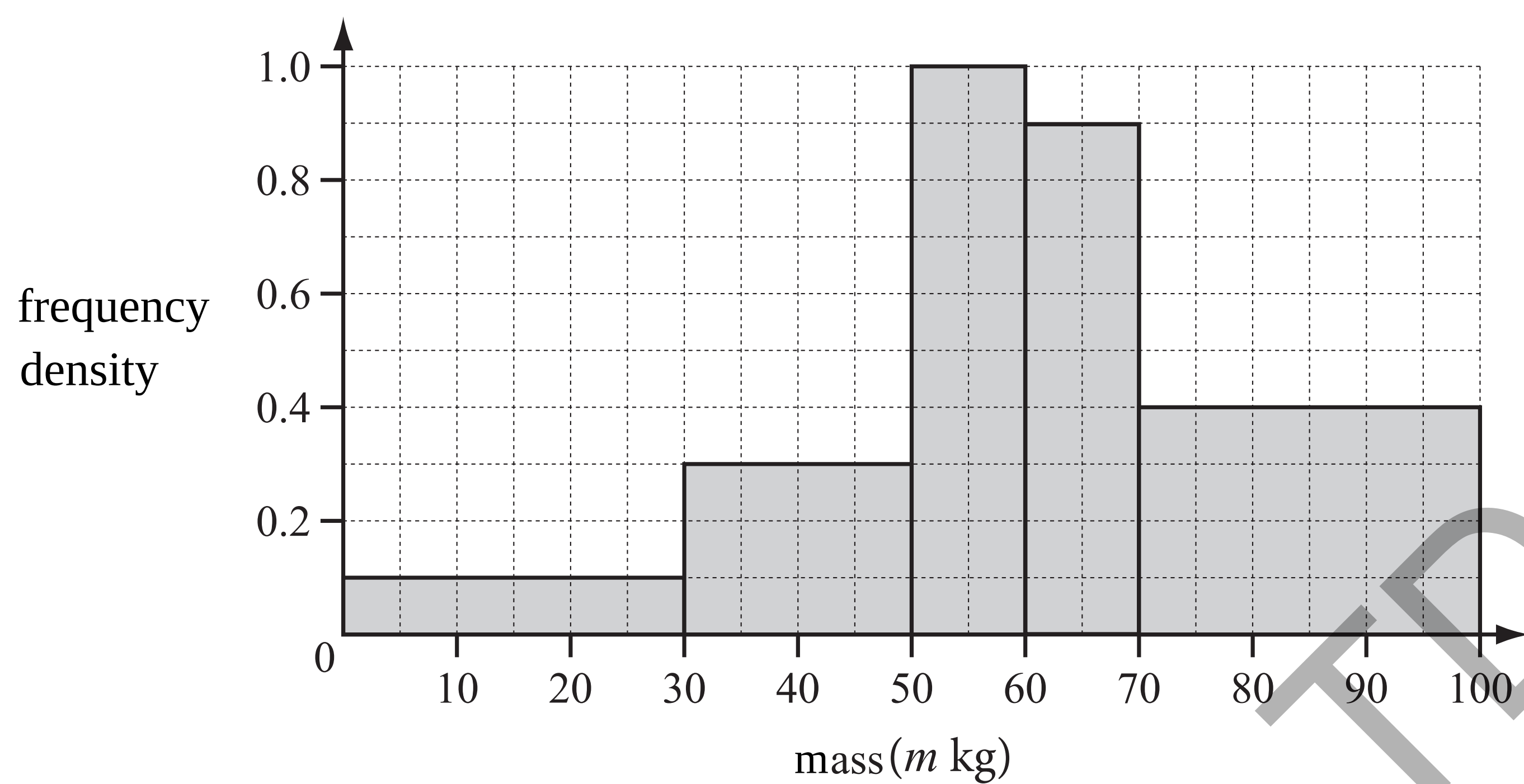
$$x = \dots\dots\dots 1.2 \dots\dots\dots \text{ or } x = \dots\dots\dots 4.7 \dots\dots\dots [2]$$

- 18 Write as a single fraction in its simplest form.

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

$$\frac{2}{x(x+2)} \dots\dots\dots [3]$$

19



The histogram shows some information about the masses (kg) of 40 sheep.

- (a) Show that there are 6 sheep in the interval $30 < m \leq 50$.

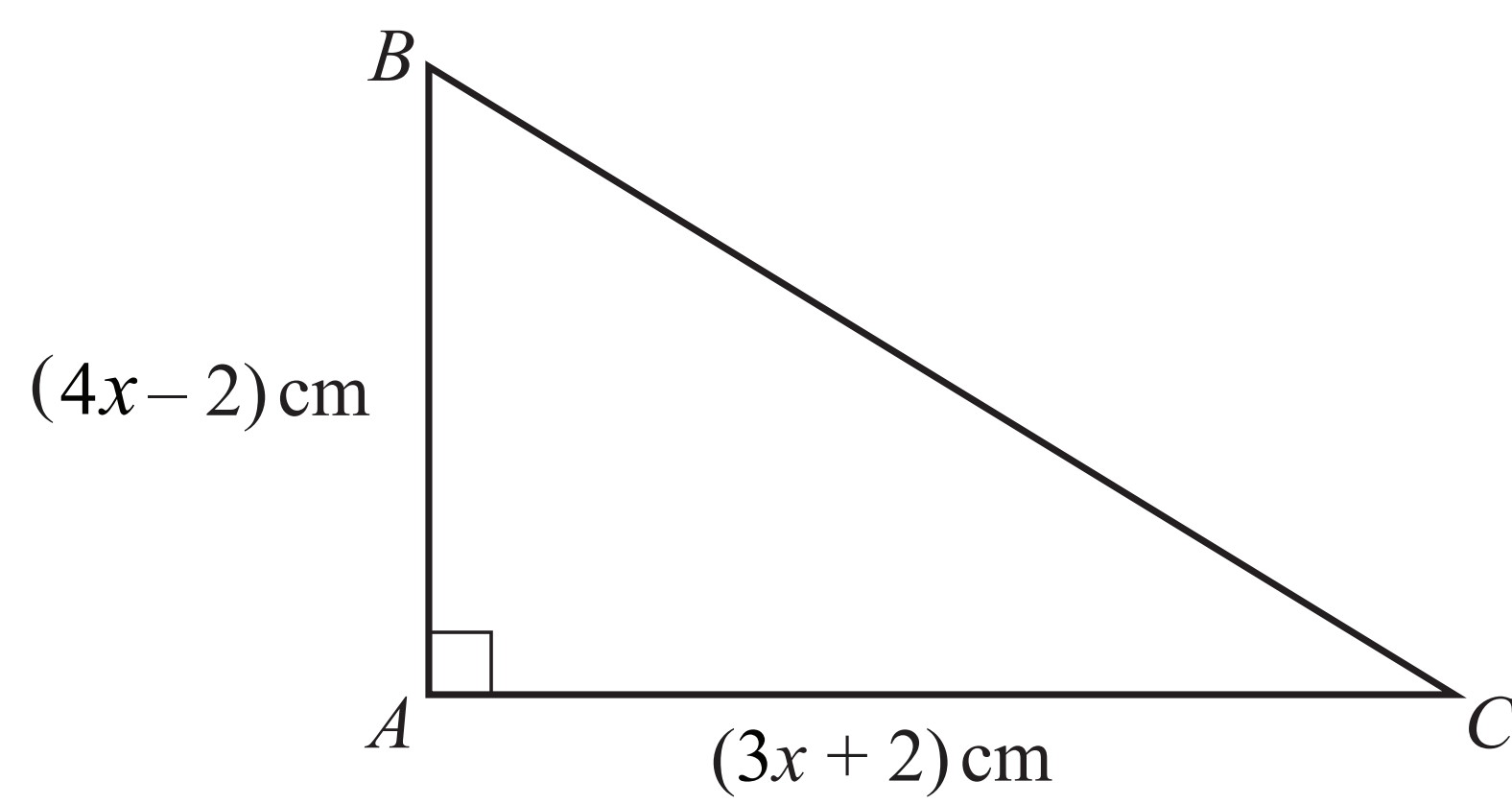
[1]

- (b) Calculate the number of sheep that have a mass of 50 kg or more.

31

[3]

- 20 The diagram shows a right-angled triangle ABC .



NOT TO
SCALE

The area of this triangle is 24 cm^2 .

- (a) Show that $6x^2 + x - 26 = 0$.

- (b) Use factorisation to solve the equation $6x^2 + x - 26 = 0$.

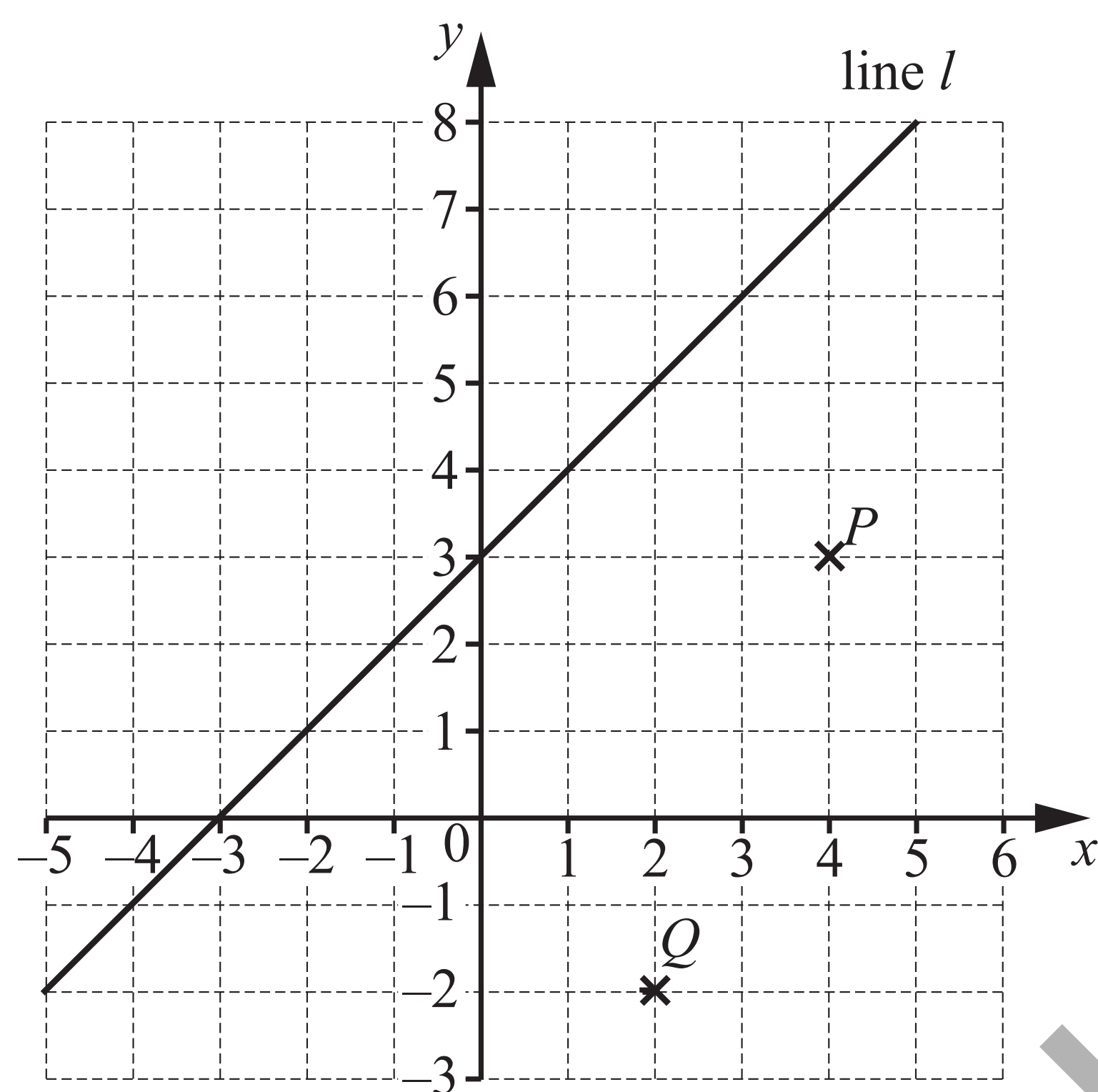
[3]

$$x = \dots 2 \dots \text{ or } x = \dots -2\frac{1}{6} \dots [3]$$

- (c) Calculate BC .

$$BC = \dots 10 \dots \text{ cm} [3]$$

21



- (a) Write down the coordinates of P .

(.....4....., ...3.....) [1]

- (b) Find the equation of line l in the form $y = mx + c$.

$y =$ $x + 3$ [2]

- (c) Find the equation of the line parallel to line l that passes through the point Q .

..... $y = x - 4$ [2]

- (d) R is the point $(5, -1)$.

Find the equation of the line perpendicular to line l that passes through the point R .

..... $y = -x + 4$ [3]

22 (a) Expand and simplify.

$$3(x - 5)(2 - x)$$

$$\underline{-3x^2 + 21x - 30} \quad [2]$$

(b) Factorise.

$$5x^3 + 10x$$

$$\underline{5x(x^2 + 2)} \quad [1]$$

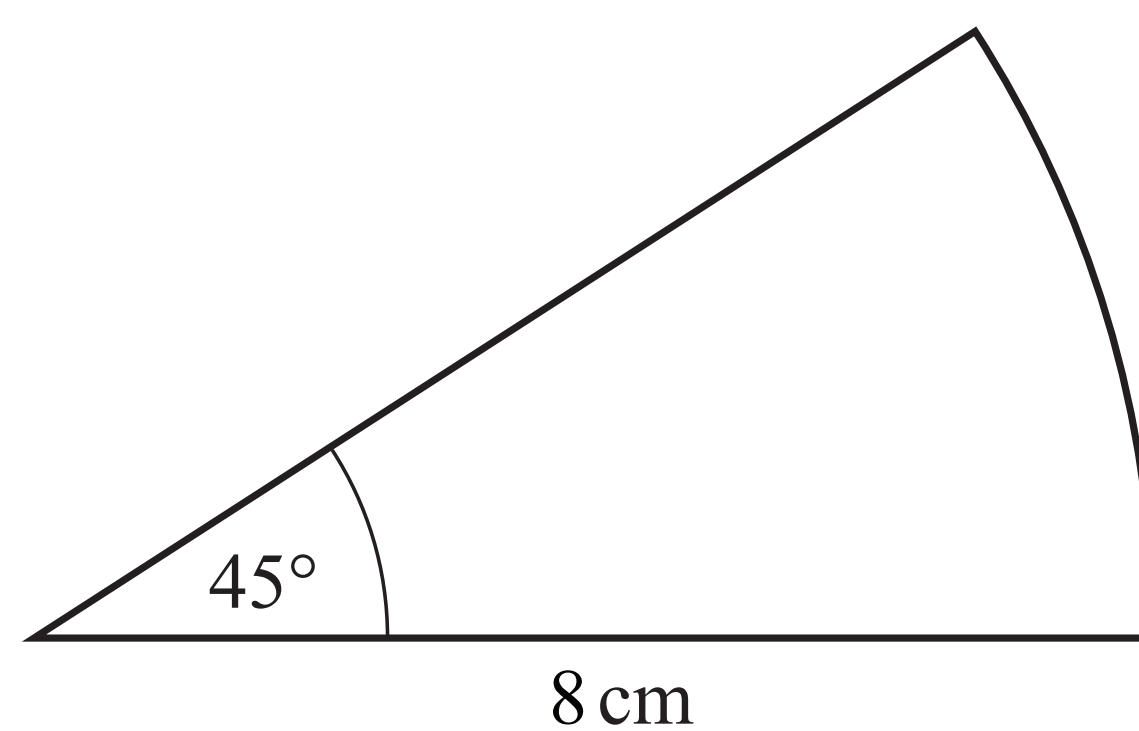
23 y is inversely proportional to x^3 .
Describes what happens to y when x is doubled.

y becomes $\frac{1}{8}$ of its original value [2]

24 A container holds 4000 mL of milk, correct to the nearest 200 mL.
The milk is poured into cups that hold exactly 50 mL each.
Calculate the minimum number of cups that can be filled completely.

$$\underline{78} \quad [2]$$

25



NOT TO SCALE

The diagram shows a sector of a circle with radius 8 cm and sector angle 45° .

The perimeter of this sector is $(m + n\pi)$ cm.

Find the value of m and the value of n .

$$m = \dots\dots\dots 16$$

$$n = \dots\dots\dots 2$$

[3]