Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

MATHEMATICS **0580/13**

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

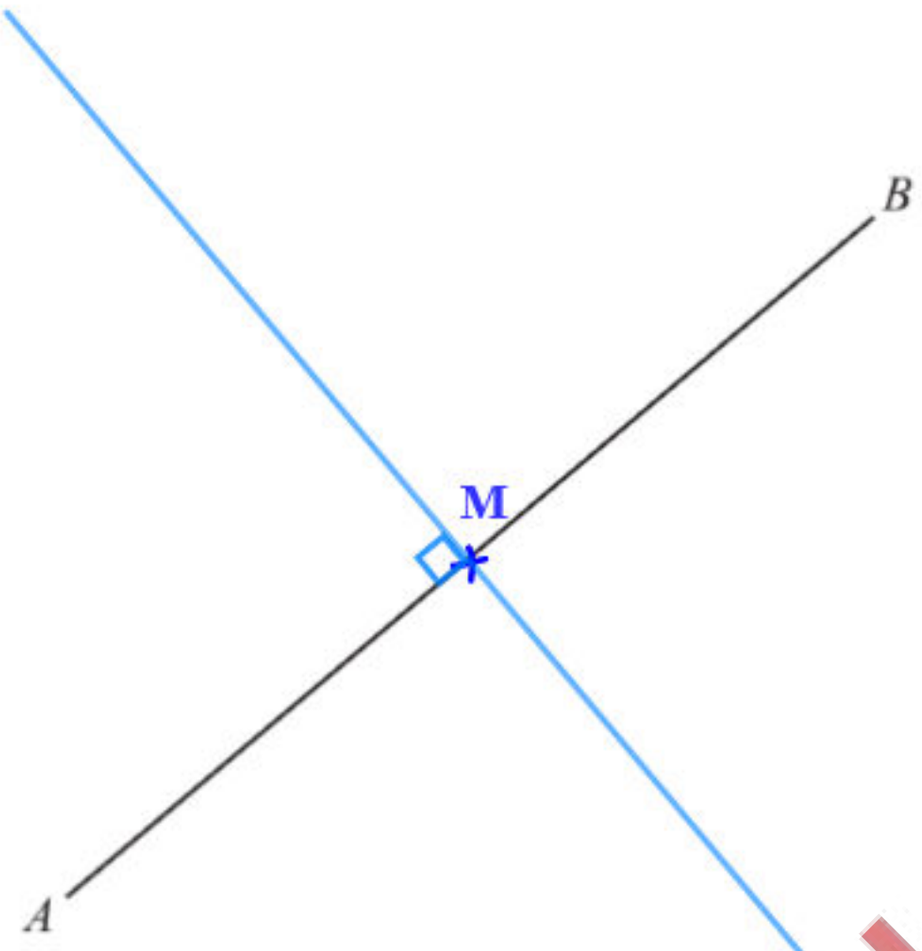
- The total mark for this paper is 56.
- The number of marks for each question or part question is shown in brackets [ ].

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

1 Write the number one hundred and three thousand eight hundred and six in figures.

103 806 [1]

2



(a) Measure the length of the line AB in millimetres.

86 mm [1]

(b) Mark the midpoint, M, of the line AB. [1]

(c) Draw a line through M that is perpendicular to the line AB. [1]

3 Simplify.

$3x - 4x + 7x$

6x [1]

4 Work out the area of a rectangle that is 9.5 m long and 6.8 m wide.

* A = l × w

= 9.5m × 6.8m

= 64.6m²

64.6 m² [2]

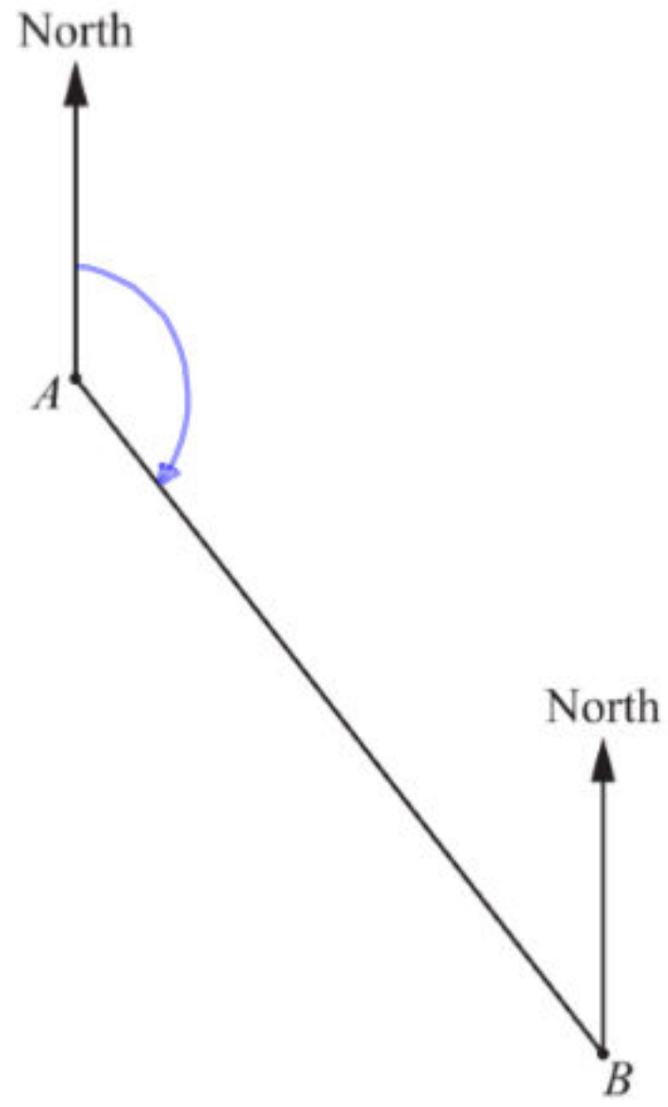
5 The probability of picking a red sweet from a bag is 0.05 .

Find the probability of not picking a red sweet.

* P = 1 - 0.05 = 0.95

0.95 [1]

6



Measure the bearing of point B from point A.

142°

[1]

7 Work out the value of $\frac{mk^3}{\sqrt{3}}$ when $m = 4$ and $k = 7$.

$\star$ $\frac{4(7)^3}{\sqrt{3}}$ = 792 (3 sig. figs.)

792

[2]

8 A box, in the shape of a cuboid, has volume 357 cm^3.
It has a length of 8.5 cm and a width of 6 cm.

Calculate the height of the box.

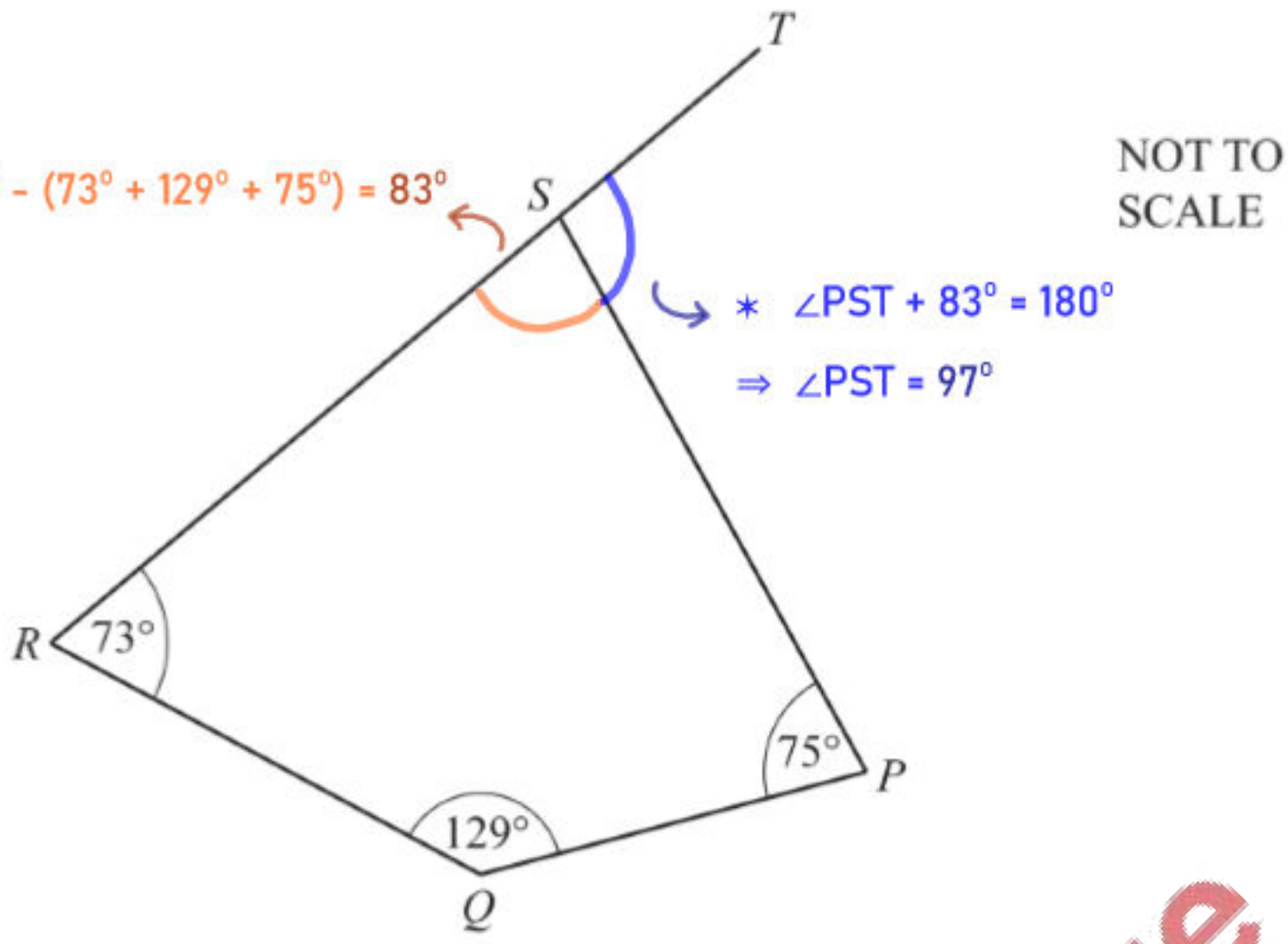
$\star$ V = l × w × h

$\Rightarrow$ $h = \frac{V}{l \times w}$

$\Rightarrow$ $h = \left(\frac{357}{8.5 \times 6}\right)$ cm = 7cm

7 cm [2]

9



PQRS is a quadrilateral.
RST is a straight line.

Find angle *PST*.

Angle *PST* = ... 97° ..... [2]

10 These are the masses, in kg, of 12 parcels.

0.3 0.4 1.2 0.8 1.1 2.1 1.7 1.8 1.2 2.3 0.7 1.1

(a) Complete the stem-and-leaf diagram for the 12 parcels.

0	3	4	7	8		
1	1	1	2	2	7	8
2	1	3				

Key: 0 | 3 represents 0.3 kg

[2]

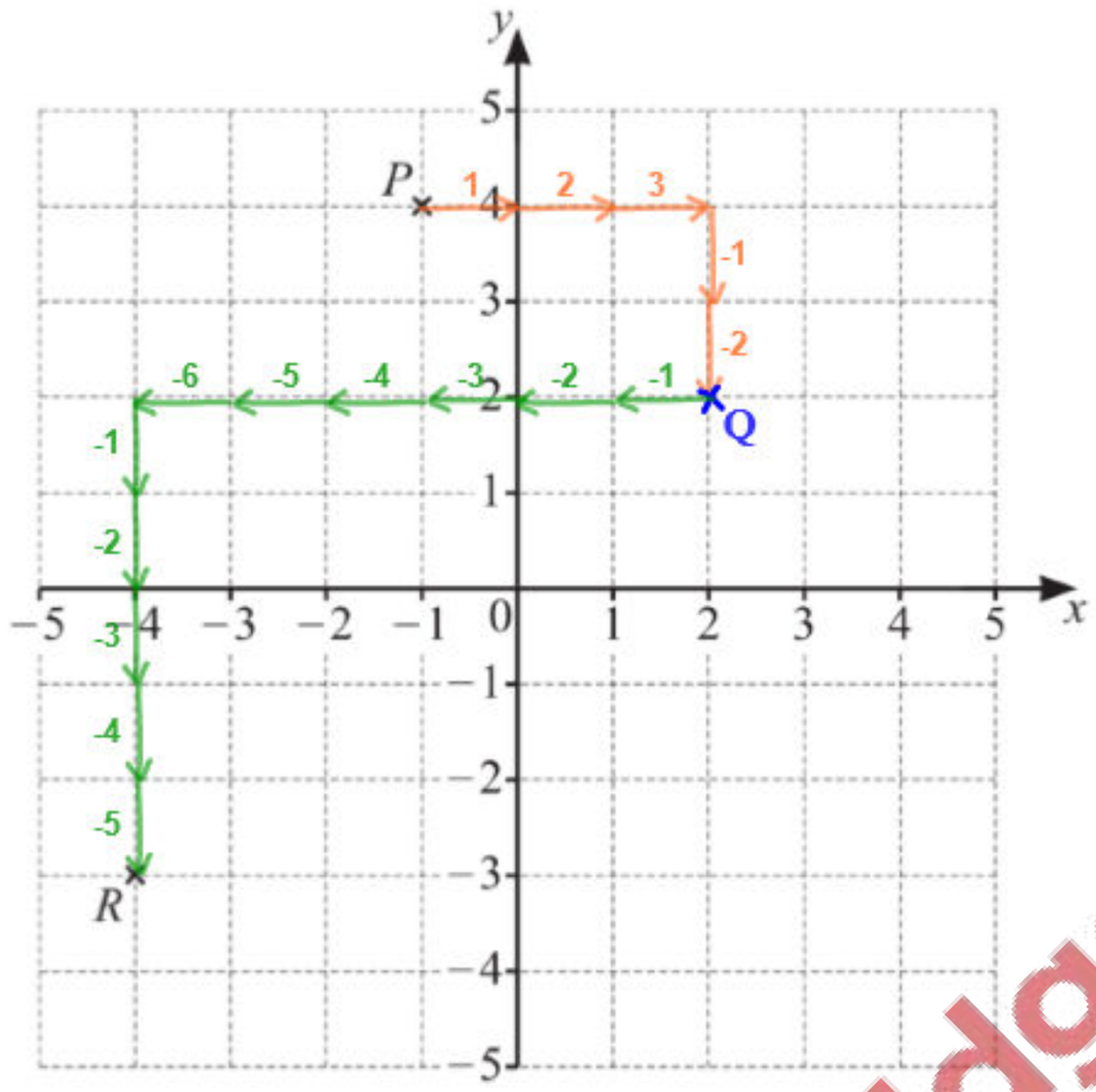
(b) Find the median.

* Median position = $\frac{1}{2}(12 + 1)$th = 6.5th

* Median = $\frac{(1.1 + 1.2)\text{kg}}{2}$ = 1.15kg

..... 1.15 ..... kg [1]

11 The grid shows point P and point R.



(a) Write down the coordinates of point P.

(-1 , 4) [1]

(b) $\overrightarrow{PQ} = \begin{pmatrix} 3 \\ -2 \end{pmatrix}$

Mark point Q on the grid. [1]

(c) Find $\overrightarrow{QR}$.

$\overrightarrow{QR} = \begin{pmatrix} -6 \\ -5 \end{pmatrix}$ [1]

(d) Complete this statement.

$\overrightarrow{PQ} + \overrightarrow{QR} =$ $\overrightarrow{\text{PR}}$ [1]

12 Simplify.

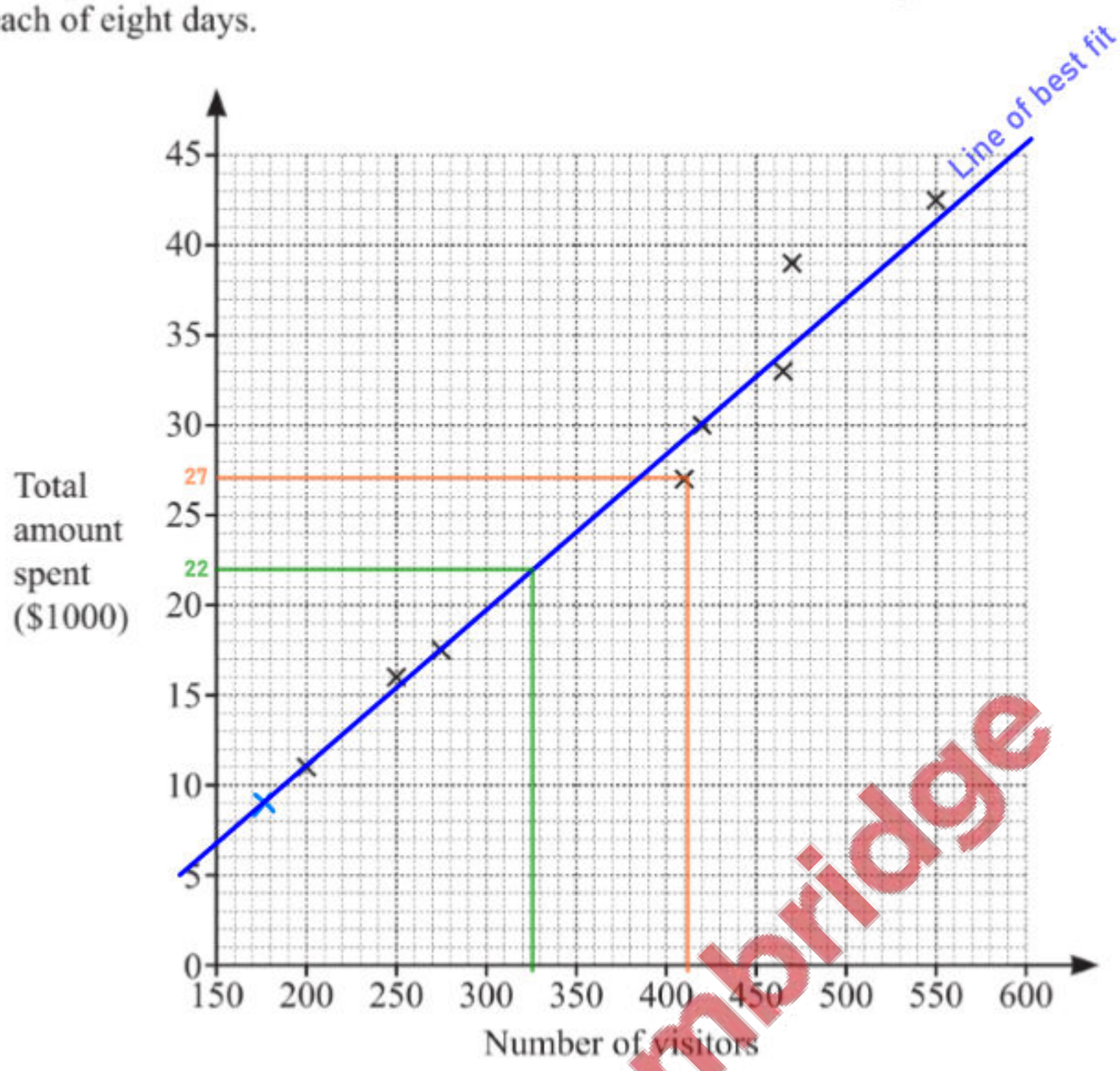
(a) $y^3 \div y^5$ = y^{3-5} = y^{-2}

y^{-2} [1]

(b) $7x^0$ = 7 × 1 = 7

7 [1]

13 The scatter diagram shows the number of visitors and the total amount spent, in thousands of dollars, at a zoo on each of eight days.



(a) On one of the eight days there are 410 visitors.

Find the total amount spent by visitors during this day.

$ 27 000 [1]

(b) Information for the ninth day is shown in the table.

Number of visitors	175
Total amount spent ($1000)	9

Plot this information on the scatter diagram. [1]

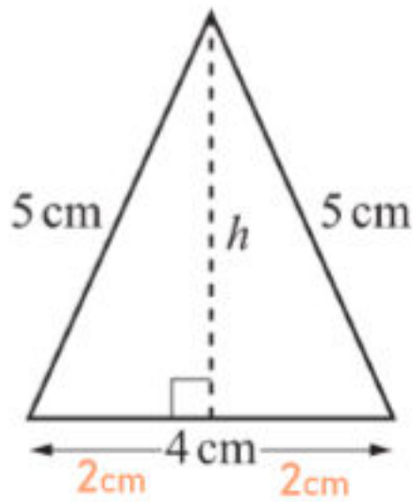
(c) Draw a line of best fit on the scatter diagram. [1]

(d) On the tenth day the total amount spent is $22 000.

Estimate the number of visitors on this day.

325 [1]

14



NOT TO SCALE

(a) Calculate the height, h, of the triangle.

$\star \quad 5^2 = h^2 + 2^2$

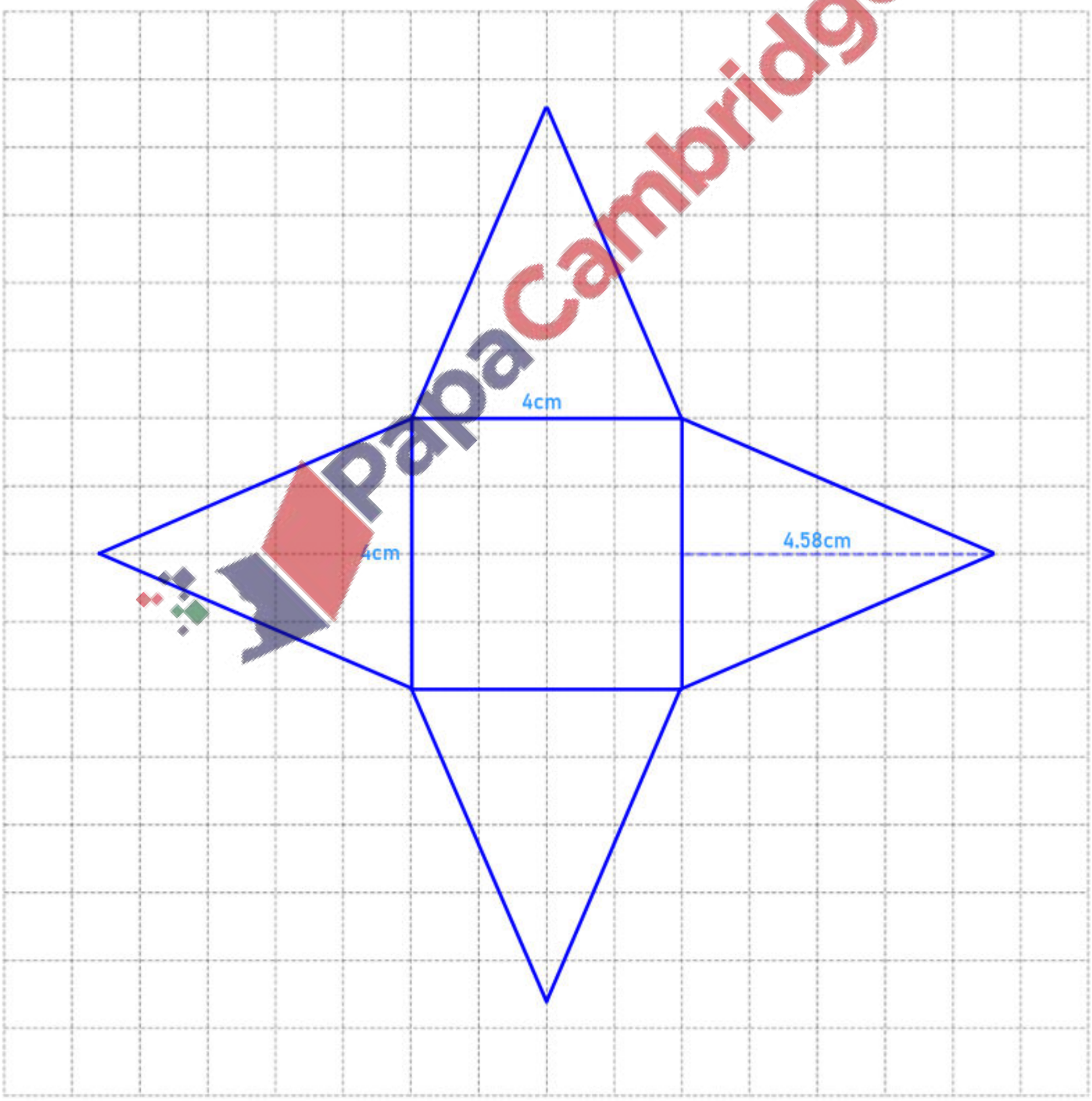
$\Rightarrow \quad h = \sqrt{5^2 - 2^2}$

$\Rightarrow \quad h = 4.58$cm (3 sig. figs.)

$h =$ ..... 4.58 ..... cm [3]

(b) The triangle is one face of a square-based pyramid.

On the 1 cm^2 grid, draw a net of this pyramid.



[3]

15 Factorise completely.

$18px - 27p$

9p (2x - 3) [2]

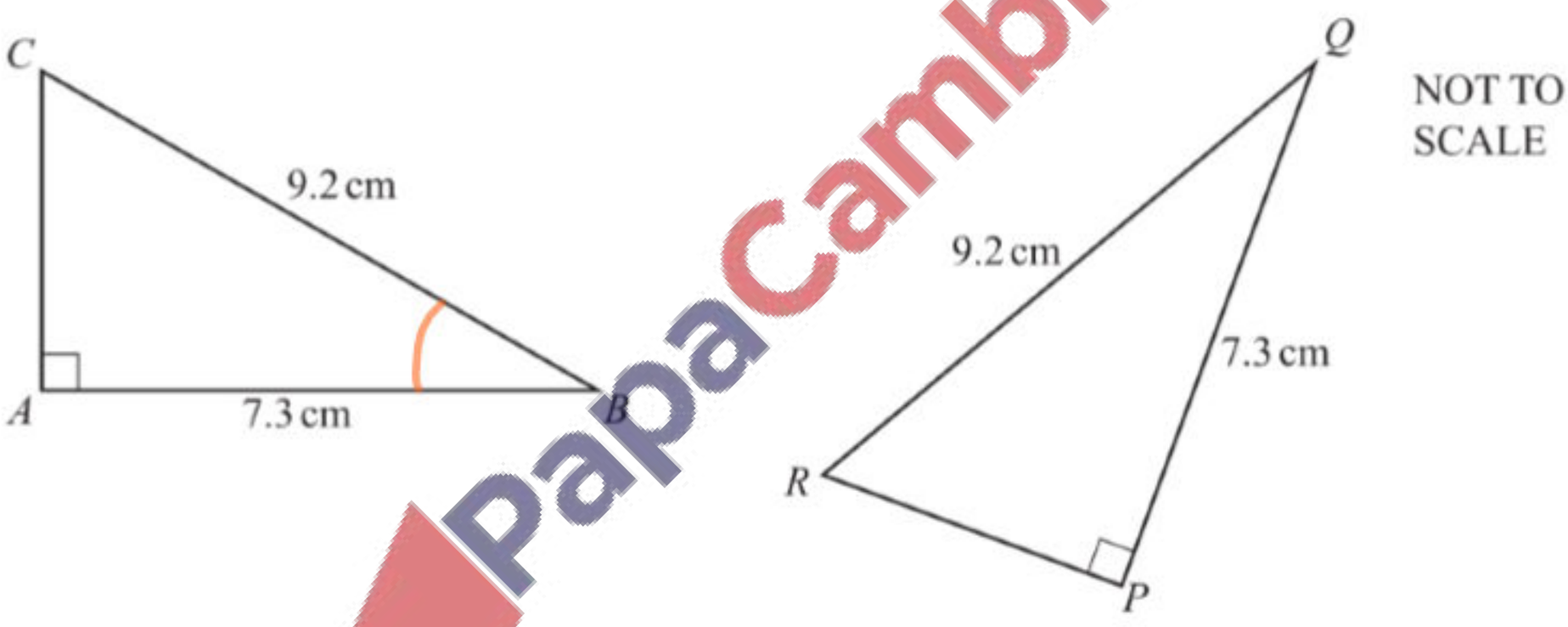
16 The nth term of a sequence is $n^2 - 1$.

Find the first three terms of this sequence.

* $1^2 - 1 = 0$
* $2^2 - 1 = 3$
* $3^2 - 1 = 8$

0 , 3 , 8 [2]

17



The diagram shows two right-angled triangles, ABC and PQR.

(a) Complete this statement with a geometrical term.

Triangle ABC is congruent to triangle PQR. [1]

(b) Calculate angle ABC.

* $\cos \angle ABC = \frac{7.3\text{cm}}{9.2\text{cm}}$

$\Rightarrow \angle ABC = \cos^{-1}\left(\frac{7.3}{9.2}\right)$

$\Rightarrow \angle ABC = 37.5°$ (1 dp)

Angle ABC = 37.5° [2]

18 Find the lowest common multiple (LCM) of 32 and 40.

* 32 → 32, 64, 96, 128, 160, ...

* 40 → 40, 80, 120, 160, ...

..... 160 ..... [2]

19 Joe thinks of a number, n, trebles it, and subtracts 5.
The result is 22.

Write this as an equation in terms of n, and solve the equation.

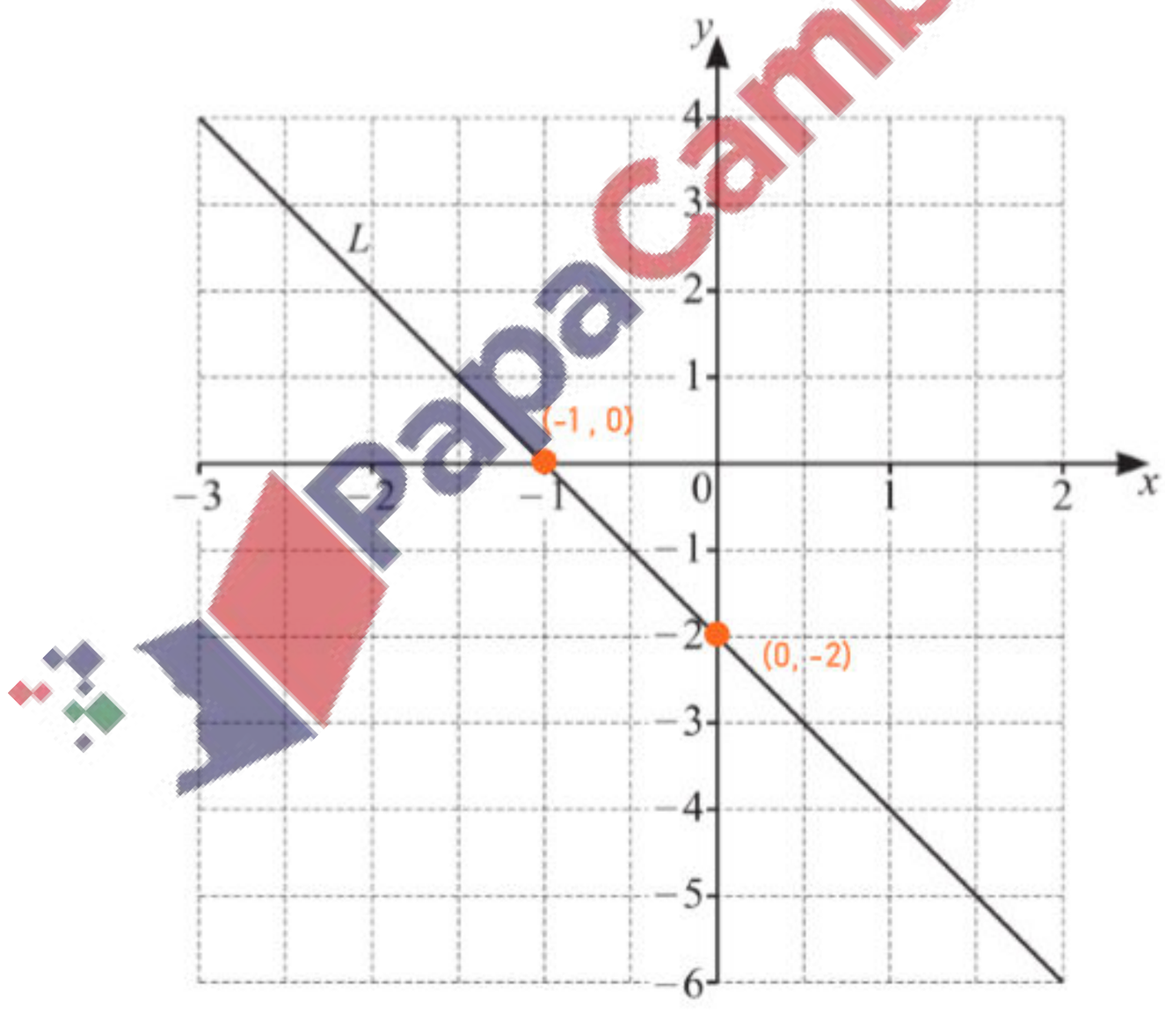
* $3n - 5 = 22$

$\Rightarrow 3n = 27$

$\Rightarrow n = 9$

$n =$ ..... 9 ..... [3]

20



Find the gradient of line L.

* $m = \frac{0 - (-2)}{-1 - 0} = -2$

..... -2 ..... [2]

21 Dominic asks 30 students in his class if they are right-handed or left-handed.
7 students are left-handed.

Work out the expected number of left-handed students in the whole school of 960 students.

$30 \rightarrow 7 \quad \Rightarrow x = \frac{7}{30} \times 960$

$960 \rightarrow x \quad \Rightarrow x = 224$

224 ..... [2]

22 **Without using a calculator**, work out $4\frac{1}{6} - 1\frac{7}{8}$.

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

$\Rightarrow \frac{25}{6} - \frac{15}{8}$

$\Rightarrow \frac{100 - 45}{24}$

$\Rightarrow \frac{55}{24} = 2\frac{7}{24}$

$2\frac{7}{24}$ ..... [3]

23 Solve the simultaneous equations.
You must show all your working.

$4x - 3y = 26$ -(1)
$5x + 6y = 13$ -(2)

(1) × 2 : $8x - 6y = 52$ -(3)

(2) + (3) : $13x = 65$

$x = 5$

Put x in (2)

$* \quad 5(5) + 6y = 13$

$\Rightarrow 25 + 6y = 13$

$\Rightarrow 6y = -12$

$\Rightarrow y = -2$

$x =$ 5 .....

$y =$ -2 ..... [3]

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