EXAMINATIONS COUNCIL OF ESWATINI
Junior Certificate Examination

CANDIDATE NAME

CENTRE NUMBER | | | | |

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MATHEMATICS **309/01**

Paper 1 **October/November 2025**

2 hours

Candidates answer on the Question Paper.
Additional materials: Tracing paper (optional)

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on the spaces provided.
Write in dark blue or black pen in the spaces provided on the Question Paper.
You may use a pencil for any diagrams or graphs.
Do **not** use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions.

All working should be clearly shown below each question.
The number of marks is given in brackets [ ] at the end of each question or part question.

Calculators should **not** 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 in degrees to one decimal place.
3-figure tables may be used in any question where necessary.
The total of the marks for this paper is 100.

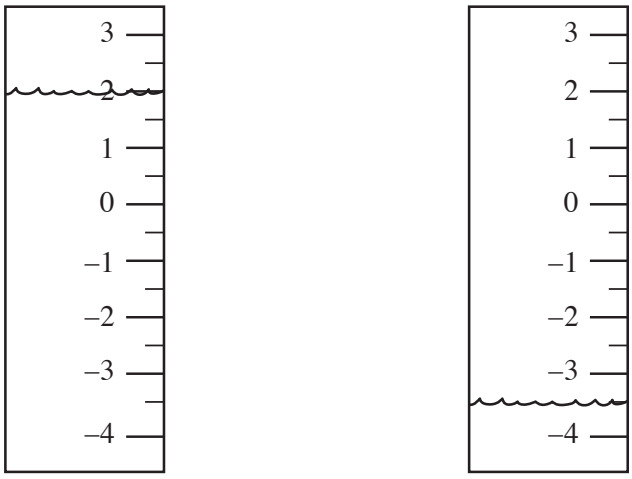
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[Turn over

1 The diagram shows water levels of a dam on a dry season measured in metres.



(a) By how many metres did the water level drop.

Answer (a)……..…… [2]

(b) On the next day, heavy rains followed and water levels rose by 5.3 metres.

Find the water levels after the rains.

Answer (b)……..…… [1]

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2 **(a)** Express 0.03 as a fraction.

Answer (a)……..…… [1]

(b) Arrange in order of size starting with the smallest.

$\frac{2}{3}$, 0.6 , $\frac{5}{6}$, 66%.

Answer (b)……< ……<……<……. [2]

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3 **(a)** Given that

$x = 3py - 6y$

Find the value of x when $p = -3$ and $y = 2$.

Answer (a) $x =$ …… [2]

(b) Factorise.

$3py - 6y$

Answer (b)……..……. [2]

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4 Express as a single fraction.

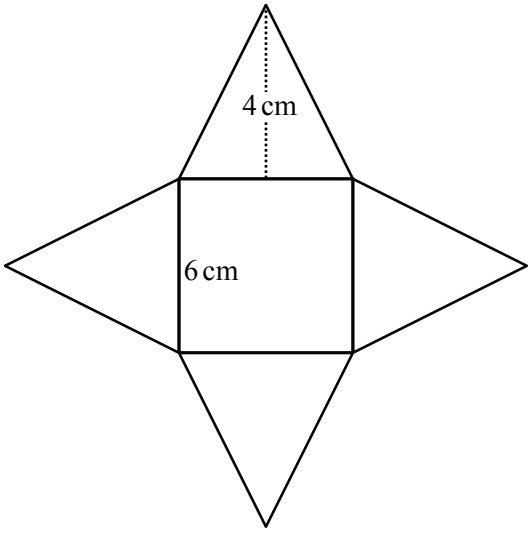
$$\frac{5x + 4}{2} - \frac{2x + 3}{3}$$

Answer……..……. [3]

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5 The diagram shows a square and four identical isosceles triangles.

The length of the square is 6 cm and the isosceles triangles have a height of 4 cm.



NOT TO SCALE

(a) Calculate the area of

(i) one isosceles triangle,

Answer (a)(i)……..…… [2]

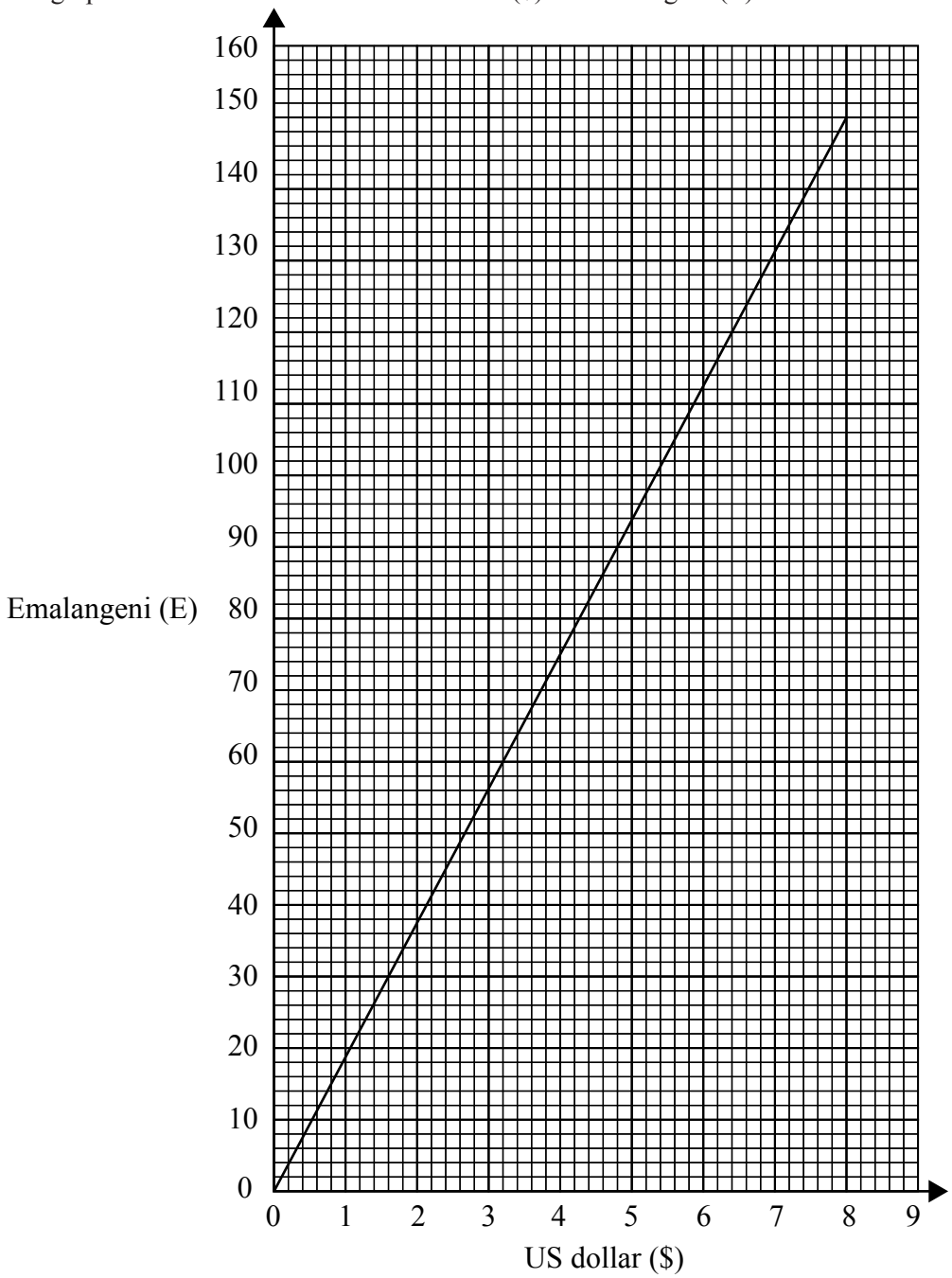
(ii) the whole shape.

Answer (a)(ii)…….…… [2]

(b) The diagram is a net of a pyramid.
Write down the name of the pyramid.

Answer (b)…….....…..…… [1]

6 The graph shows the conversion of US dollar ($) to Emalangeni (E).



Use the graph to convert,

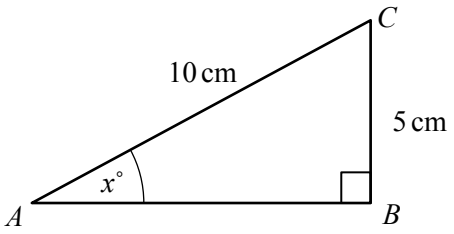
(a) $2 to E.

Answer (a)……..…… [1]

(b) E112 to $.

Answer (b)……..…… [1]

7 The figure shows a right-angled triangle ABC.



$AC = 10$ cm, $BC = 5$ cm and angle $ABC = 90^o$

(a) Use the table to find angle x^o.

Angle (°)	cos	sin	tan
30	0.866	0.500	0.577
45	0.707	0.707	1.00
60	0.500	0.866	1.73

Answer (a) x^o =……..……..... [2]

(b) Given that $\sqrt{0.75} = 0.866$ and $\sqrt{7.5} = 2.74$.

Calculate the length of AB.

Answer (b)…… [3]

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8 Work out

$$4\frac{1}{3} - 2\frac{1}{4} \cdot$$

Answer ……...…… [3]

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9 Carol buys a bag of oranges for E45.
She sells all the oranges at E2 each.

(a) If the bag contains 30 oranges,

Calculate the profit she makes.

Answer (a)……...…… [2]

(b) Calculate the percentage profit she makes on the cost price.

Answer (b)……...…… [2]

---

10 (a) Simo invests E5 000 in a bank at 5% simple interest per annum.

Calculate Simo's investment after 3 years.

Answer (a) ……...…… [3]

(b) Simplify the ratio

1.2 : 3

Answer (b)……...…… [2]

11 (a) A bag contains 3 red balls, 4 blue balls and 1 white ball.
A ball is chosen at random from the bag.

Find the probability that the ball is

(i) red,

Answer (a)(i)……..…… [1]

(ii) blue or white.

Answer (a)(ii)……..…… [2]

(b) The probability that it rains tomorrow is $\frac{5}{7}$.

State the probability that is does not rain tomorrow.

Answer (b)……...…… [1]

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[Turn over

12 Simplify

(a) $x^3 \times x^{-3}$,

Answer (a)……..…… [1]

(b) $y^{-4} \div y^2$,

Answer (b)……..…… [1]

(c) $(m^3)^4$.

Answer (c)……..…… [1]

---

13 **(a)** Write the number 802.398 to 2 decimal places.

Answer (a)……..…… [1]

(b) Estimate.

$$\frac{30.5 \times 9.63}{0.95 \times 4.02}$$

Answer (b)……..…… [3]

(c) Express 0.00402 in standard form.

Answer (c)……..…… [1]

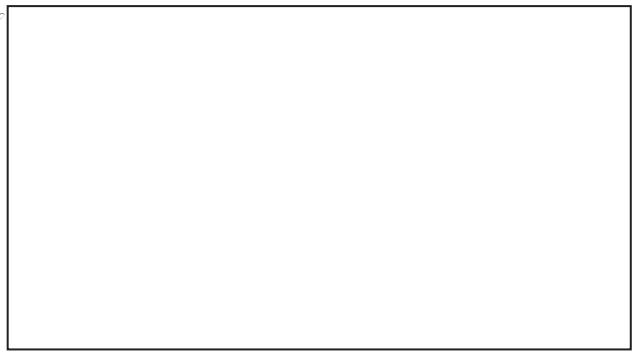
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14 Given that

$\mathscr{E} = (1, 2, 3, 4, 5, 6, 7, 8, 9, 10)$, $A = (2, 3, 5, 7)$ and $B = (2, 4, 6, 8, 10)$.

(a) Draw a Venn diagram to represent this information.

$\mathscr{E}$



[2]

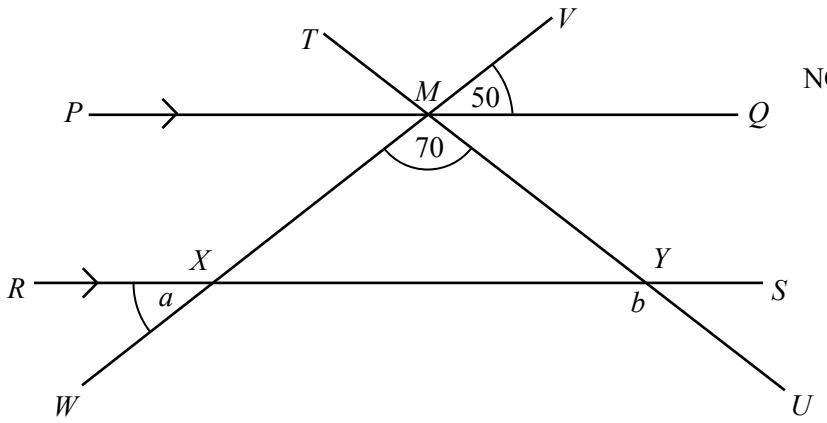
(b) Write down the $n(A \cup B)$.

Answer (b)……[1]

(c) State the special name given to the numbers in set A.

Answer (c)……[1]

15 Given the diagram below.



VW and *TU* are straight lines which intersect at *M*.
PQ and *RS* are parallel lines.
Angle *VMQ* = 50° and angle *XMY* = 70°.

(a) Find the value for,

(i) angle *a*,

Answer (a)(i)……..…..…… [1]

(ii) angle *b*.

Answer (a)(ii)……..…….....…… [2]

(b) State the special name given to pairs of angles,

(i) *PMX* and *RXW*,

Answer (b)(i)…….……...…..…… [1]

(ii) *PMX* and angle *MXY*.

Answer (b)(ii)…….....…..…… [1]

16 Given the sequence of numbers below,

33, 28, 23, 18, 13, …

(a) Find the next 3 terms of the sequence.

Answer (a)……...…… [2]

(b) State the rule of the sequence.

Answer (b)……...…… [1]

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17 **(a)** Expand and simplify.

$3(2c - 5d) - 4c$

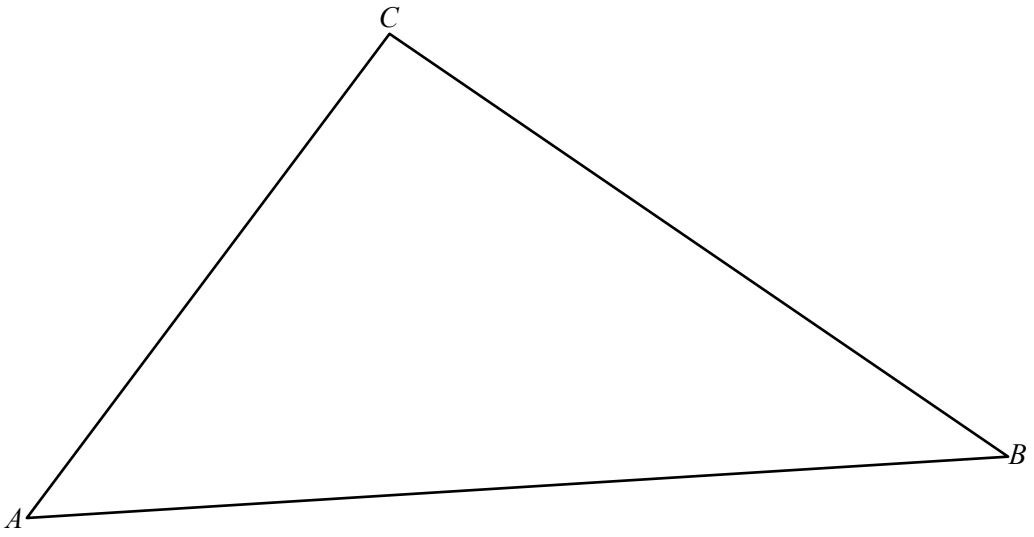
Answer (a)……...…… [2]

(b) $\frac{3}{5m} - \frac{2}{3m}$

Answer (b)……...…… [2]

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18 The diagram below shows a triangular grazing field.



(a) Draw the locus of points equidistance from AB and AC [2]

(b) He then ties a goat on a pole at B using a rope that is 5 m long.
Taking 1 cm to represent 1 m, show the region the goat can graze on. [2]

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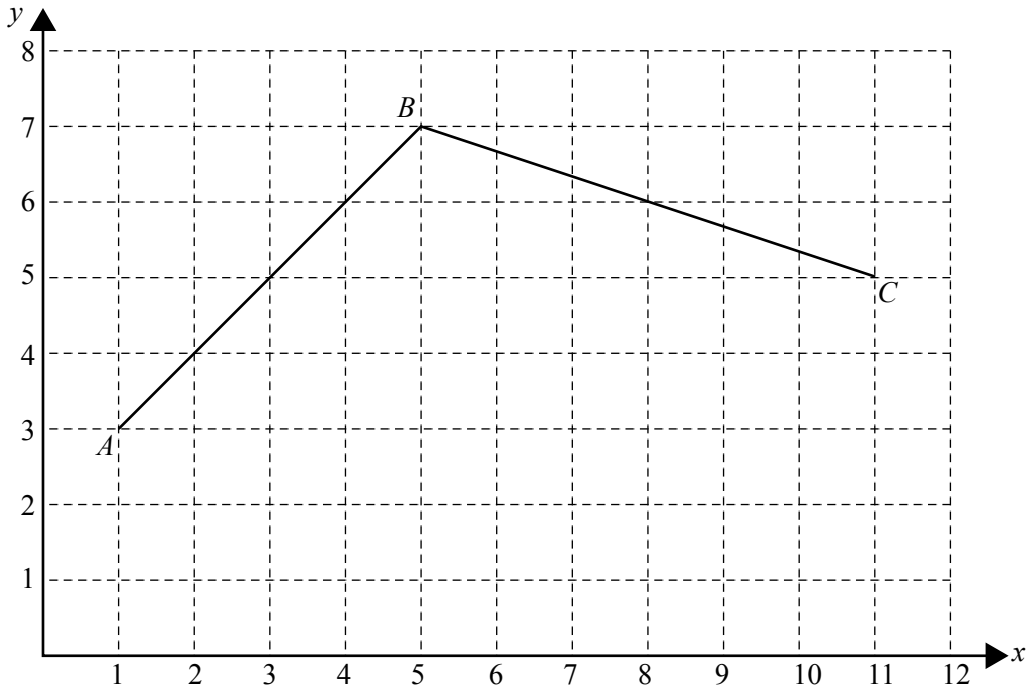
19 Work out, leave your answer as a decimal.

$\sqrt{0.0081}$

Answer…….... [3]

---

20 Points A, B and C are shown on the grid.



(a) Plot the point D on the grid such that $ABCD$ is a parallelogram. [1]

(b) Write the column vector for $\overrightarrow{BC}$

Answer (b)……..… [1]

(c) Given that M is a mid-point of $\overrightarrow{AC}$,

Write the column vector for $\overrightarrow{AM}$.

Answer (c)…….....…… [1]

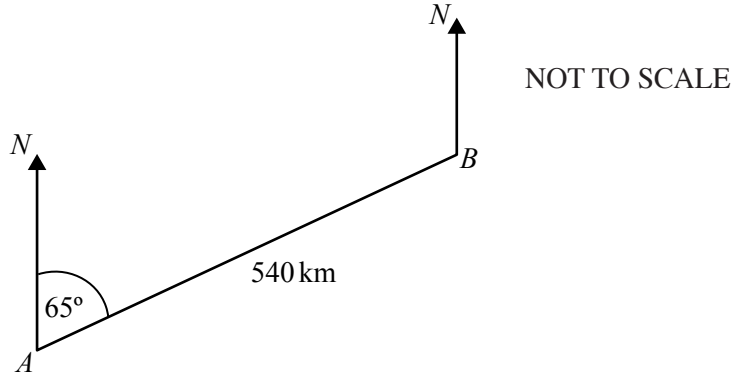
(d) Given the vectors,

$$\mathbf{a} = \begin{pmatrix} -3 \\ 4 \end{pmatrix}, \quad \mathbf{b} = \begin{pmatrix} 8 \\ -3 \end{pmatrix}$$

Find $4\mathbf{a} - 3\mathbf{b}$.

Answer (d)……..... [3]

21 The diagram shows the distance between two towns A and B.



(a) Find the bearing of town A from town B.

Answer (a)……...…… [2]

(b) Ian drove $\frac{5}{9}$ of the distance from town A to town B to a petrol station.

Calculate how far is the petrol station.

Answer (b)……...…… [2]

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22 Given the information about 5 numbers.

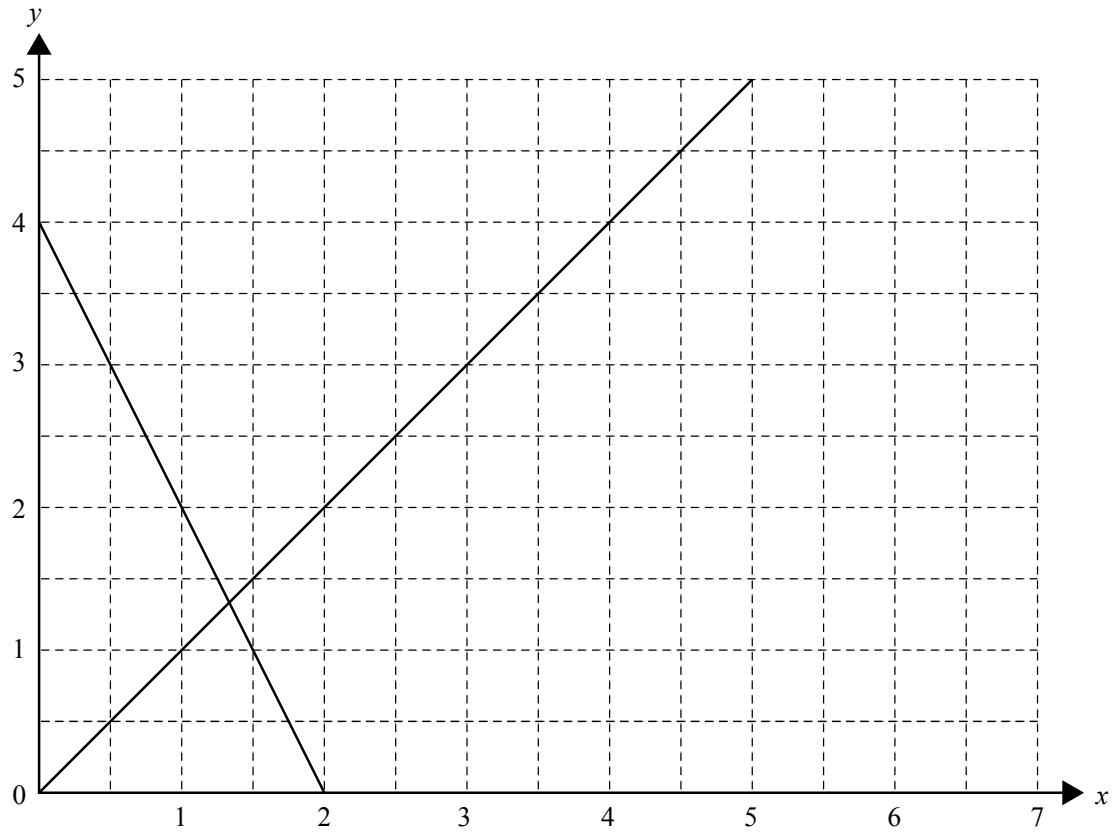
- The largest number is 15.
- The range is 10.
- The mode is 8.
- The other number is a triangular number.

Find the other four numbers.

Answer……...…… [3]

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23 The grid shows the line $y = x$ and the line $y = -2x + 4$.



(a) Draw the line $y = 3$. [1]

(b) Shade the regions defined by the 3 inequalities.

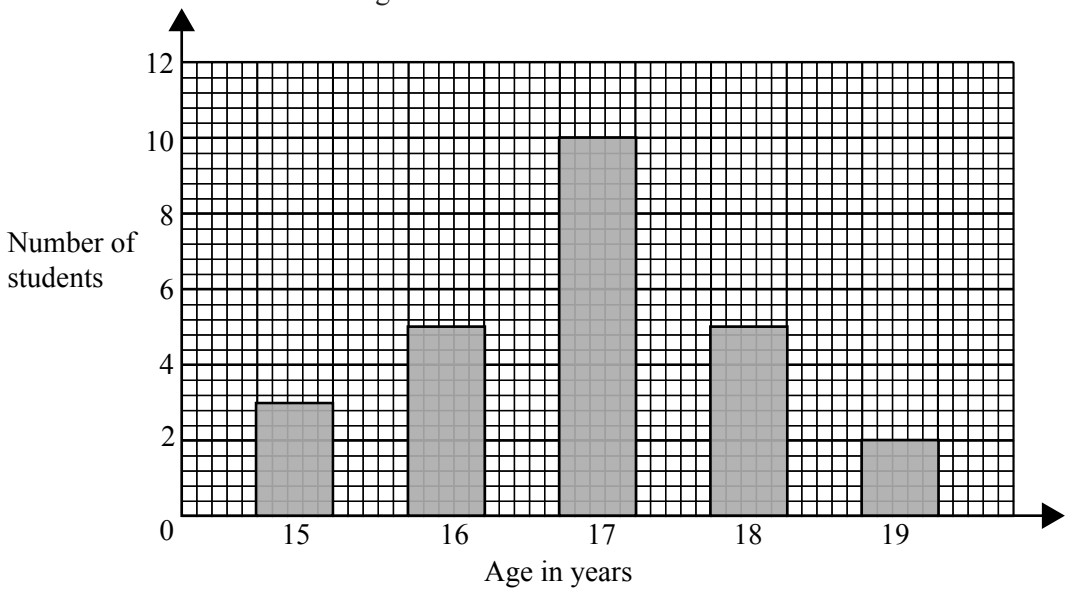
$y \leq x$, $y \leq -2x + 4$, $y \geq 3$. [3]

24 Construct triangle LMN.

$LM = 10$ cm, $LN = 7$ cm and angle $LMN = 40°$.

[3]

25 The bar chart below shows the age of 25 students in a class.



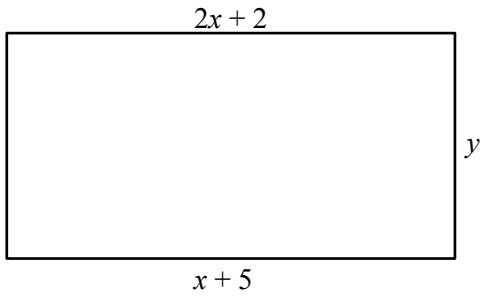
(a) Find the modal age.

Answer (a)……[1]

(b) Find the median age.

Answer (b)……[2]

26 Given the rectangle below.

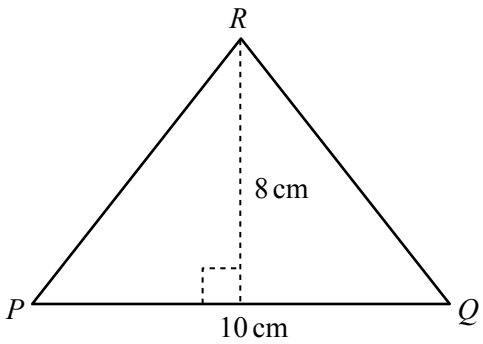


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(a) Find the value of x.

Answer (a) x =……...…….. [2]

(b) The area of the rectangle is equal to the area of triangle PQR.



NOT TO SCALE

PQ = 10 cm and the height is 8 cm.

Find the value of y.

Answer (b) y =…… [3]

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