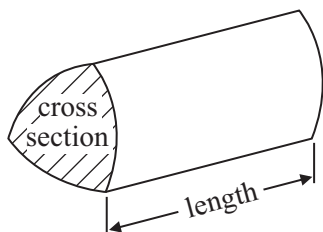


GCSE Mathematics 1MA0

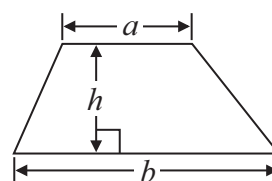
Formulae: Higher Tier

**You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.**

Volume of prism = area of cross section \times length

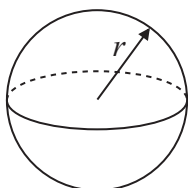


Area of trapezium = $\frac{1}{2} (a + b)h$



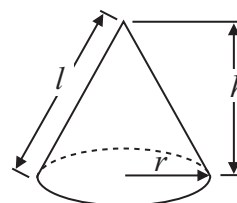
Volume of sphere = $\frac{4}{3} \pi r^3$

Surface area of sphere = $4\pi r^2$

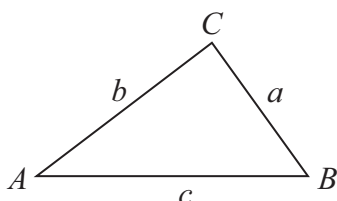


Volume of cone = $\frac{1}{3} \pi r^2 h$

Curved surface area of cone = $\pi r l$



In any triangle ABC



The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

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

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

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

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

You must NOT use a calculator.

1 Given that $1793 \times 185 = 331\,705$

write down the value of

(a) 1.793×185

.....

(b) $331\,705 \div 1.85$

.....

(Total for Question 1 is 2 marks)

2 Mr Mason asks 240 Year 11 students what they want to do next year.

15% of the students want to go to college.

$\frac{3}{4}$ of the students want to stay at school.

The rest of the students do not know.

Work out the number of students who do not know.

.....

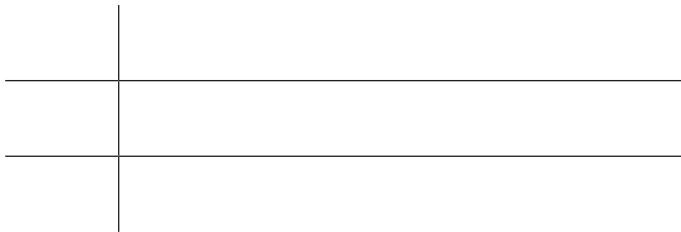
(Total for Question 2 is 4 marks)

3 Sixteen babies are born in a hospital.

Here are the weights of the babies in kilograms.

2.4 2.7 3.5 4.4 4.5 4.1 4.4 2.8
4.1 3.8 3.8 4.2 3.3 3.0 3.7 3.3

Show this information in an ordered stem and leaf diagram.



Key:

(Total for Question 3 is 3 marks)

4 (a) Expand $3(2 + t)$

.....
(1)

(b) Expand $3x(2x + 5)$

.....
(2)

(c) Expand and simplify $(m + 3)(m + 10)$

.....
(2)

(Total for Question 4 is 5 marks)

5 Write 525 as a product of its prime factors.

.....
(Total for Question 5 is 3 marks)

6 Ed has 4 cards.
There is a number on each card.

12

6

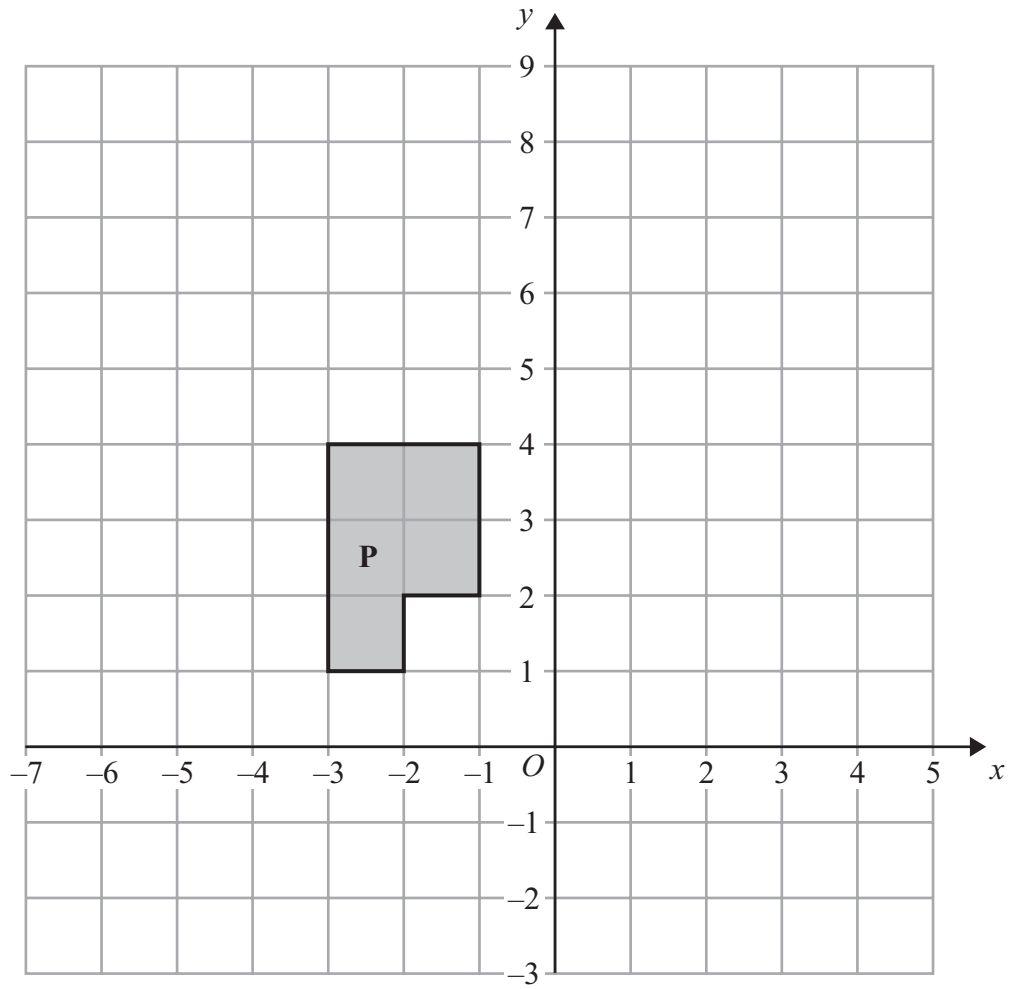
15

?

The mean of the 4 numbers on Ed's cards is 10

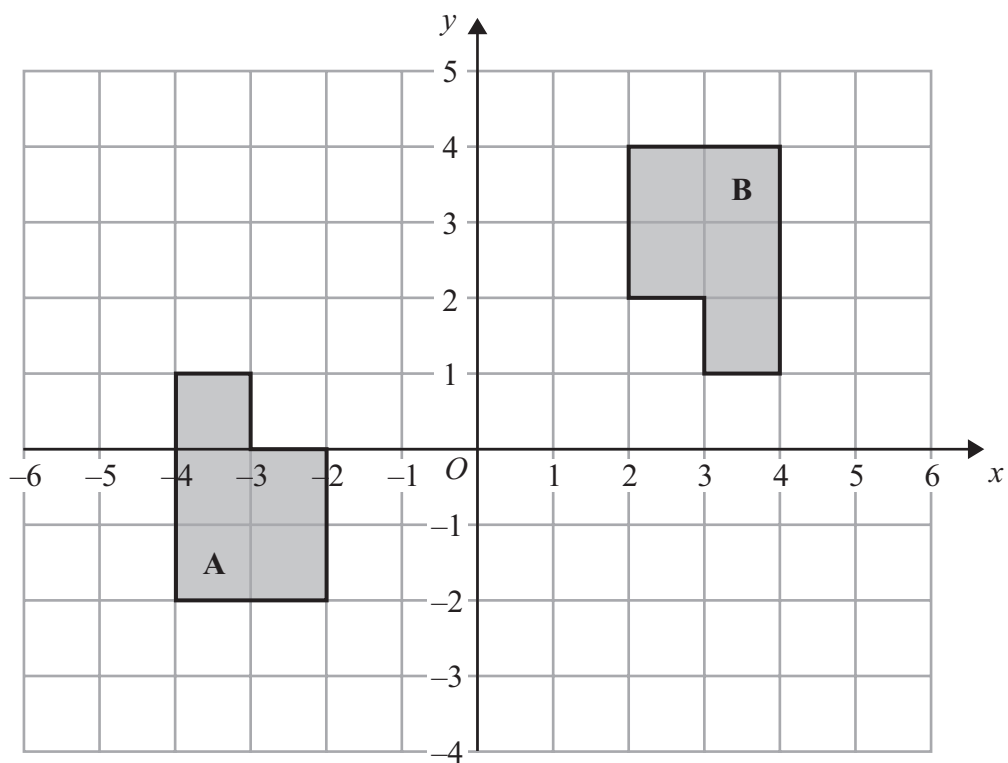
Work out the number on the 4th card.

.....
(Total for Question 6 is 3 marks)



(a) Translate shape **P** by the vector $\begin{pmatrix} 5 \\ -2 \end{pmatrix}$

(2)



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

.....

.....

(3)

(Total for Question 7 is 5 marks)

- 8 Margaret has some goats.
The goats produce an average total of 21.7 litres of milk per day for 280 days.
Margaret sells the milk in $\frac{1}{2}$ litre bottles.

Work out an estimate for the total number of bottles that Margaret will be able to fill with the milk.

You must show clearly how you got your estimate.

.....
(Total for Question 8 is 3 marks)

- 9 Matt and Dan cycle around a cycle track.
Each lap Matt cycles takes him 50 seconds.
Each lap Dan cycles takes him 80 seconds.

Dan and Matt start cycling at the same time at the start line.

Work out how many laps they will each have cycled when they are next at the start line together.

Matt laps

Dan laps

(Total for Question 9 is 3 marks)

10 The diagram shows a garden in the shape of a rectangle.

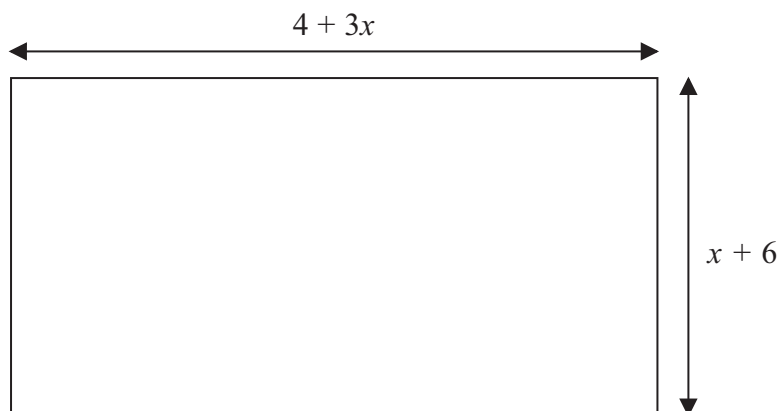


Diagram **NOT**
accurately drawn

All measurements are in metres.

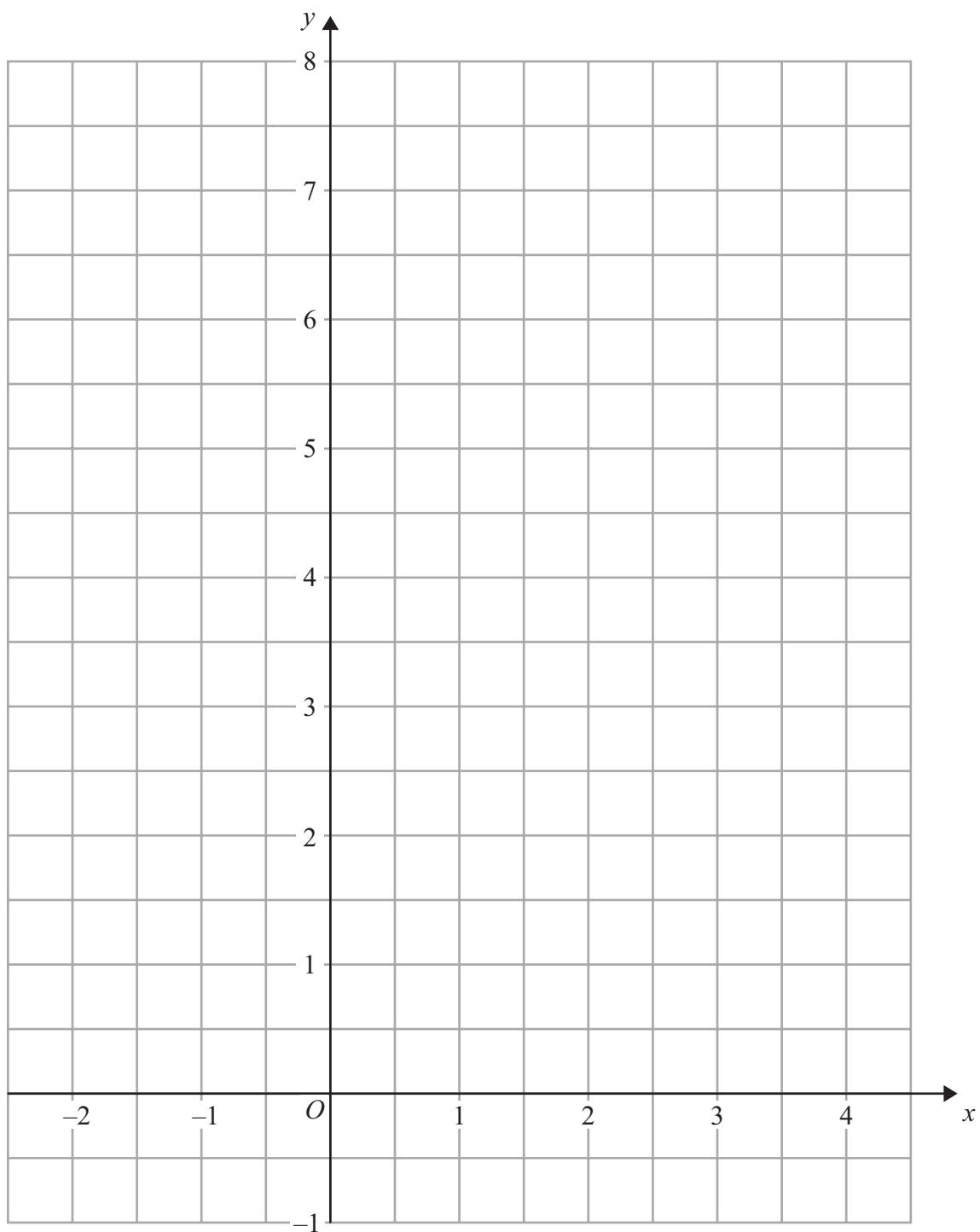
The perimeter of the garden is 32 metres.

Work out the value of x

.....

(Total for Question 10 is 4 marks)

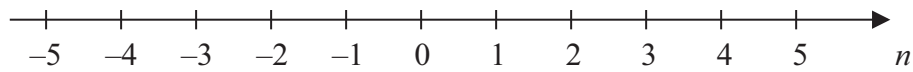
- 11 On the grid, draw the graph of $y = \frac{1}{2}x + 5$ for values of x from -2 to 4



(Total for Question 11 is 3 marks)

12 $-2 < n \leq 3$

(a) Represent this inequality on the number line.



(2)

(b) Solve the inequality $8x - 3 \geq 6x + 4$

.....
(2)

(Total for Question 12 is 4 marks)

***13** One sheet of paper is 9×10^{-3} cm thick.

Mark wants to put 500 sheets of paper into the paper tray of his printer.
The paper tray is 4 cm deep.

Is the paper tray deep enough for 500 sheets of paper?
You must explain your answer.

(Total for Question 13 is 3 marks)

14 Solve the simultaneous equations

$$\begin{aligned}4x + 7y &= 1 \\3x + 10y &= 15\end{aligned}$$

$x = \dots\dots\dots$

$y = \dots\dots\dots$

(Total for Question 14 is 4 marks)

15 Write these numbers in order of size.
Start with the smallest number.

5^{-1}

0.5

-5

5^0

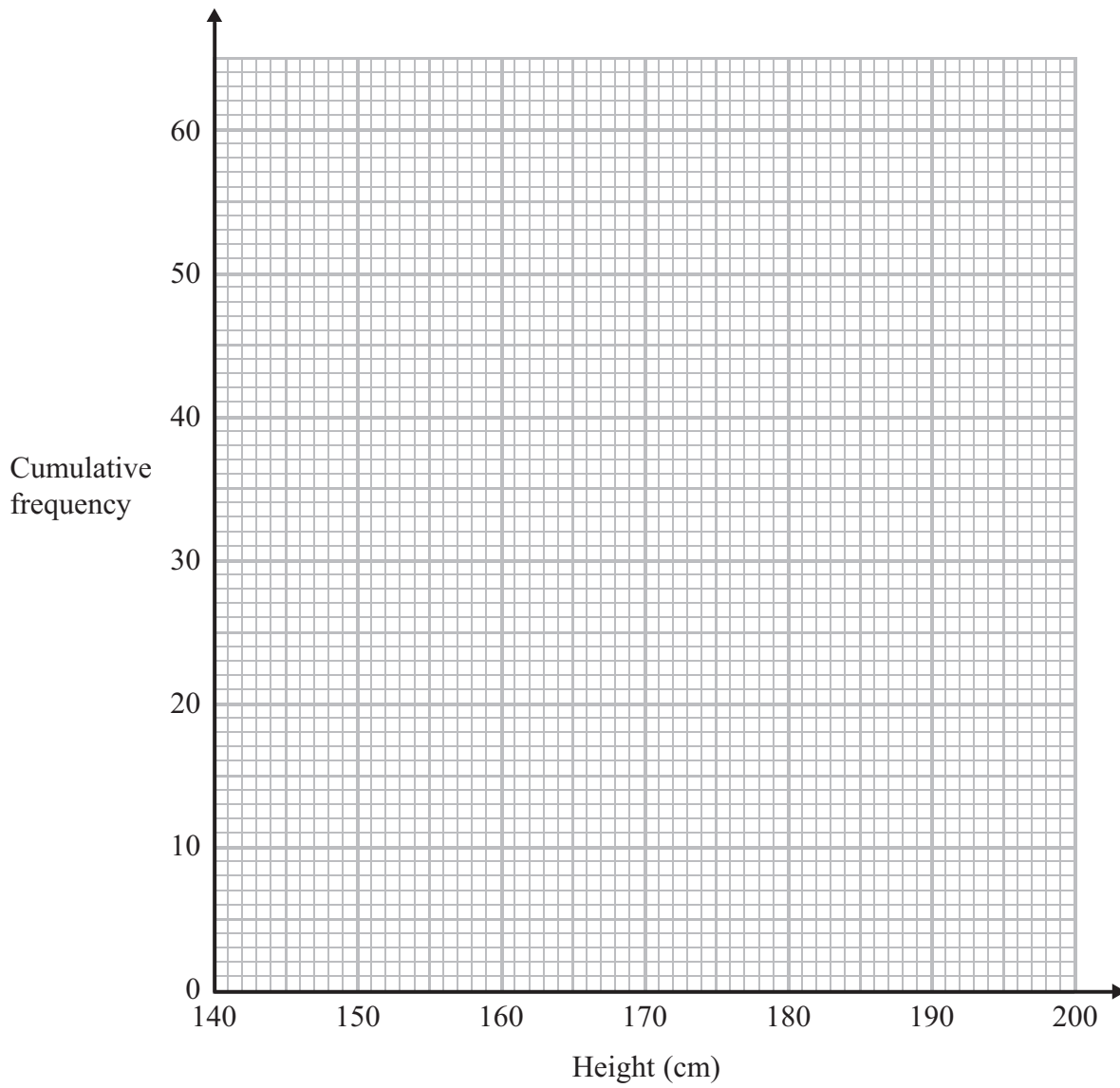
(Total for Question 15 is 2 marks)

16 The table below shows information about the heights of 60 students.

| Height (x cm) | Number of students |
|--------------------|--------------------|
| $140 < x \leq 150$ | 4 |
| $150 < x \leq 160$ | 5 |
| $160 < x \leq 170$ | 16 |
| $170 < x \leq 180$ | 27 |
| $180 < x \leq 190$ | 5 |
| $190 < x \leq 200$ | 3 |

(a) On the grid opposite, draw a cumulative frequency graph for the information in the table.

(3)



(b) Find an estimate

(i) for the median,

..... cm

(ii) for the interquartile range.

..... cm

(3)

(Total for Question 16 is 6 marks)

17. Simplify $\frac{4(x + 5)}{x^2 + 2x - 15}$

.....
(Total for Question 17 is 2 marks)
