Write your name here

Surname	Other names

Edexcel GCSE

Centre Number	Candidate Number

Mathematics A

Paper 1 (Non-Calculator)

Higher Tier

Tuesday 6 November 2012 – Morning
Time: 1 hour 45 minutes

Paper Reference
1MA0/1H

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- **Calculators must not be used.**



Information

- The total mark for this paper is 100
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed.

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

P40673A

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6/6/7/C2

P 4 0 6 7 3 A 0 1 2 8

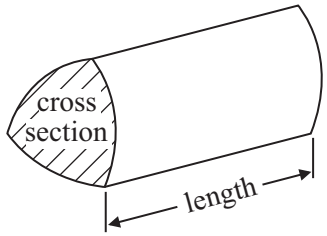
PEARSON

GCSE Mathematics 1MA0

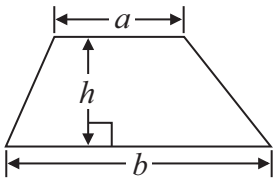
Formulae: Higher Tier

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 × length

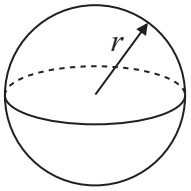


Area of trapezium = $\frac{1}{2}(a + b)h$



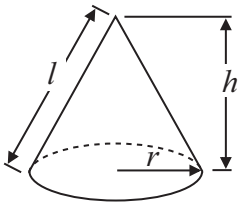
Volume of sphere = $\frac{4}{3}\pi r^3$

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

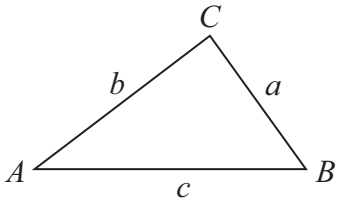


Volume of cone = $\frac{1}{3}\pi r^2 h$

Curved surface area of cone = πrl



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 Here are the ingredients needed to make 16 gingerbread men.

Ingredients
to make **16** gingerbread men

180 g flour
40 g ginger
110 g butter
30 g sugar

Hamish wants to make 24 gingerbread men.

Work out how much of each of the ingredients he needs.

.....g flour

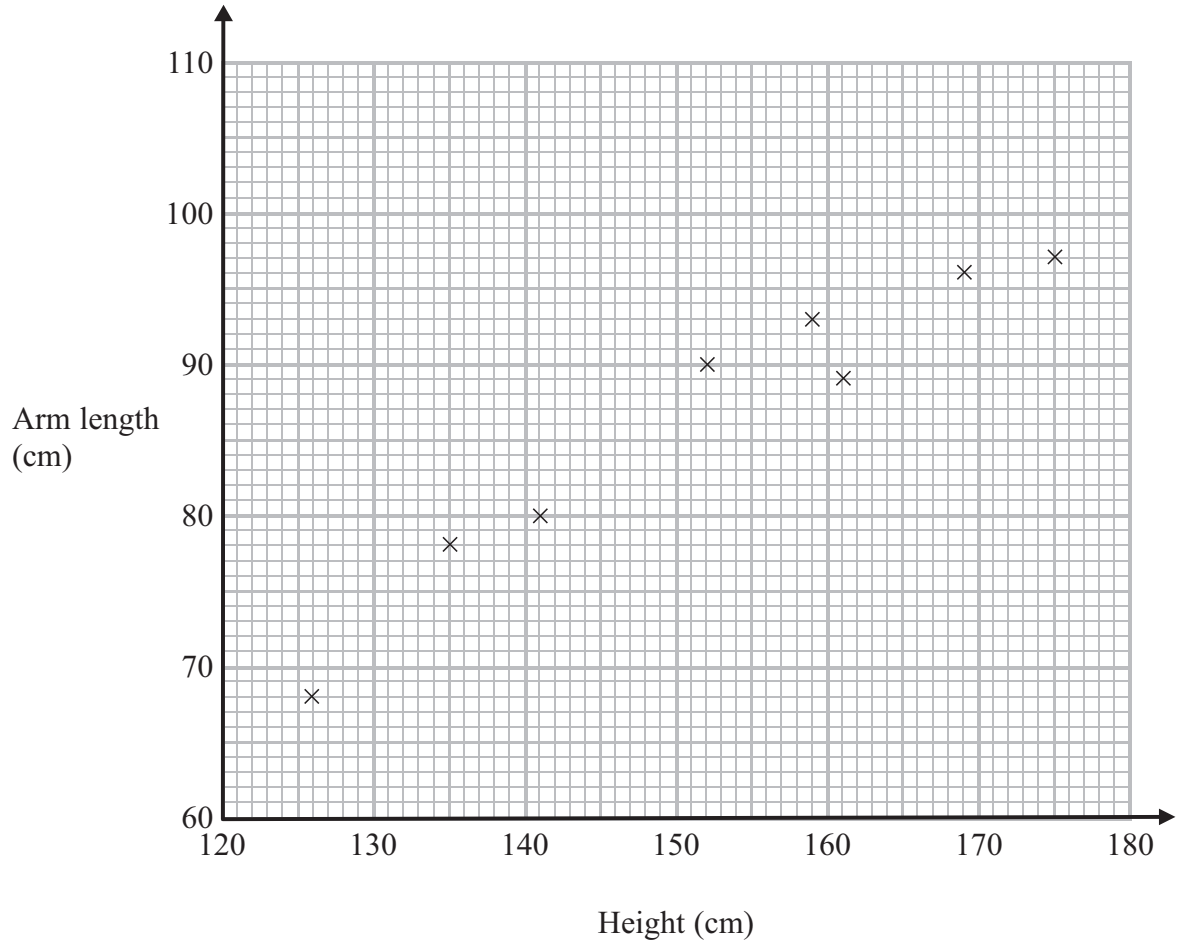
.....g ginger

.....g butter

.....g sugar

(Total for Question 1 is 3 marks)

2 The scatter graph shows information about the height and the arm length of each of 8 students in Year 11



(a) What type of correlation does this scatter graph show?

.....

(1)

A different student in Year 11 has a height of 148 cm.

(b) Estimate the arm length of this student.

.....cm

(2)

(Total for Question 2 is 3 marks)

***3** Here is part of Gary's electricity bill.

Electricity bill

New reading	7155 units
Old reading	7095 units

Price per unit 15p

Work out how much Gary has to pay for the units of electricity he used.

(Total for Question 3 is 4 marks)

4 Alison wants to find out how much time people spend reading books.
She is going to use a questionnaire.

Design a suitable question for Alison to use in her questionnaire.

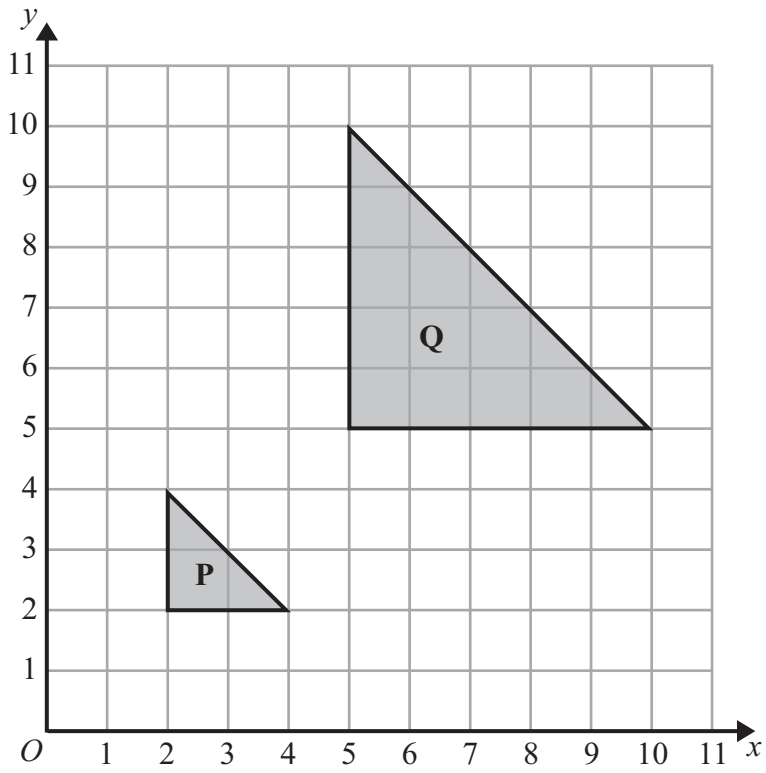
(Total for Question 4 is 2 marks)

5 Work out an estimate for $\dfrac{31 \times 9.87}{0.509}$

.....

(Total for Question 5 is 3 marks)

6



Describe fully the single transformation that maps shape **P** onto shape **Q**.

.....

.....

(Total for Question 6 is 3 marks)

7 Here is a diagram of Jim's garden.

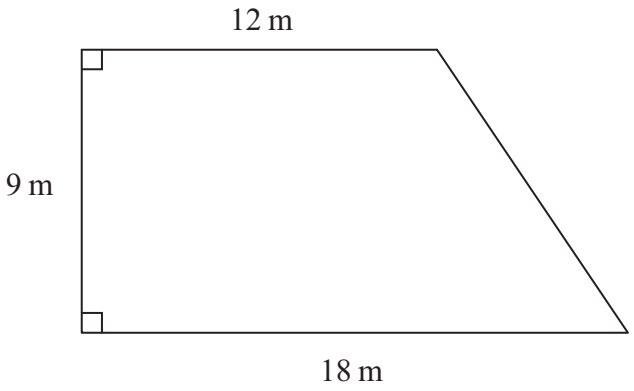


Diagram **NOT** accurately drawn

Jim wants to cover his garden with grass seed to make a lawn.

Grass seed is sold in bags.
There is enough grass seed in each bag to cover 20 m^2 of garden.

Each bag of grass seed costs £4.99

Work out the least cost of putting grass seed on Jim's garden.

£.....

(Total for Question 7 is 4 marks)

8 There are only red counters, blue counters, white counters and black counters in a bag.

The table shows the probability that a counter taken at random from the bag will be red or blue.

Colour	red	blue	white	black
Probability	0.2	0.5		

The number of white counters in the bag is the same as the number of black counters in the bag.

Tania takes at random a counter from the bag.

(a) Work out the probability that Tania takes a white counter.

.....

(2)

There are 240 counters in the bag.

(b) Work out the number of red counters in the bag.

.....

(2)

(Total for Question 8 is 4 marks)

9 The diagram shows a prism.

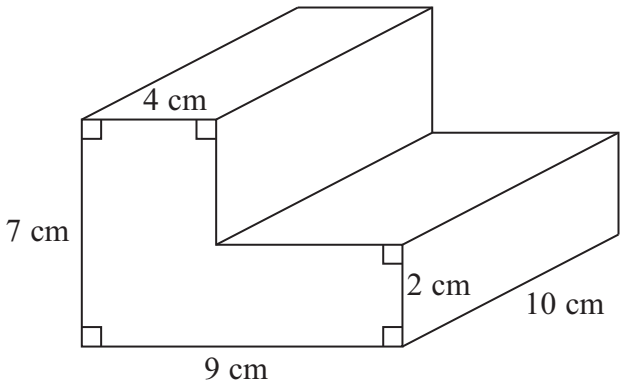


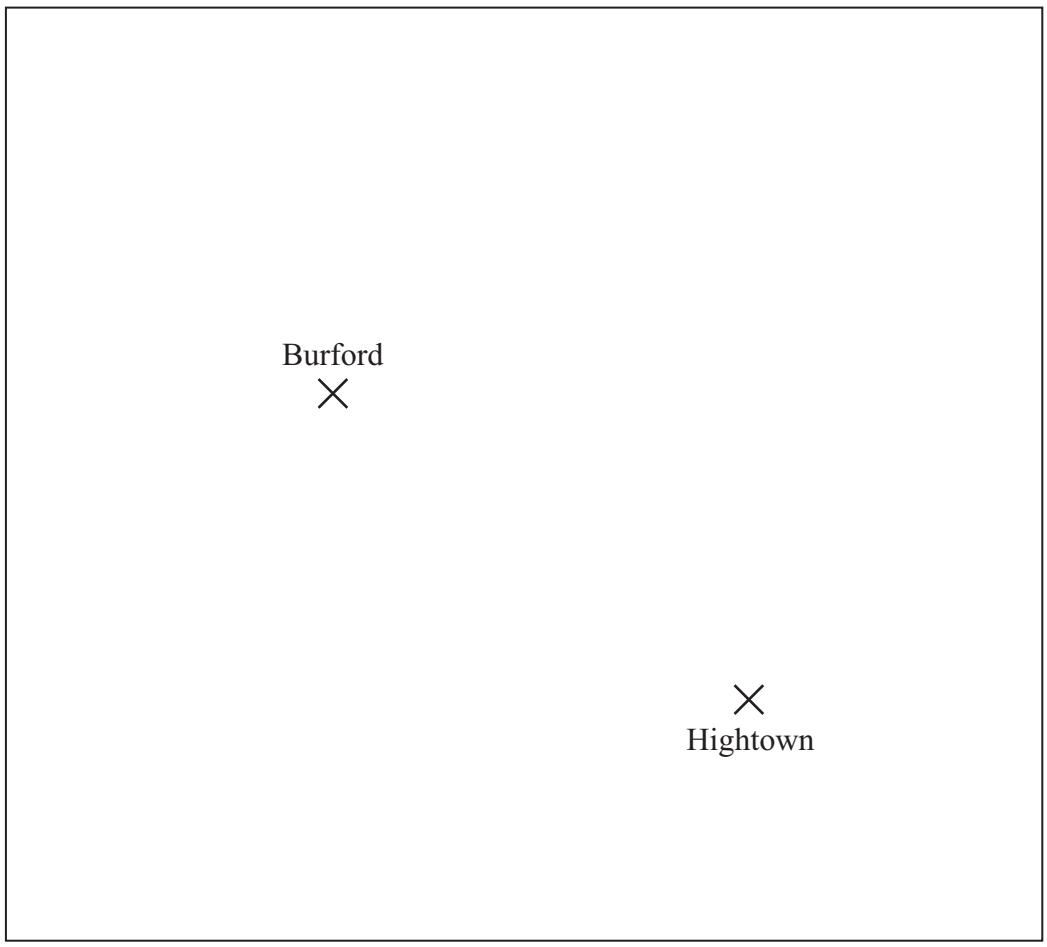
Diagram **NOT** accurately drawn

Work out the volume of the prism.

.....cm^3

(Total for Question 9 is 3 marks)

10 Here is a map.
The map shows two towns, Burford and Hightown.



Scale: 1 cm represents 10 km

A company is going to build a warehouse.

The warehouse will be less than 30 km from Burford **and** less than 50 km from Hightown.

Shade the region on the map where the company can build the warehouse.

(Total for Question 10 is 3 marks)

11 (a) Expand $4(3x + 5)$

.....

(1)

(b) Expand and simplify $2(x - 4) + 3(x + 5)$

.....

(2)

(c) Expand and simplify $(x + 4)(x + 6)$

.....

(2)

(Total for Question 11 is 5 marks)

12 The diagram shows a circle drawn inside a square.

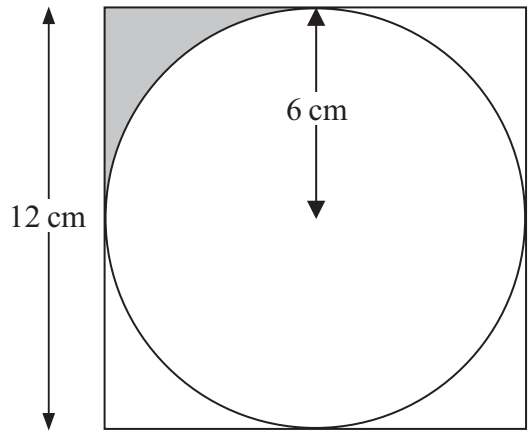


Diagram **NOT** accurately drawn

The circle has a radius of 6 cm.
The square has a side of length 12 cm.

Work out the shaded area.
Give your answer in terms of π.

.....cm^2

(Total for Question 12 is 3 marks)

***13** Talil is going to make some concrete mix.
He needs to mix cement, sand and gravel in the ratio 1 : 3 : 5 by weight.

Talil wants to make 180 kg of concrete mix.

Talil has

15 kg of cement
85 kg of sand
100 kg of gravel

Does Talil have enough cement, sand and gravel to make the concrete mix?

(Total for Question 13 is 4 marks)

14 The bearing of a ship from a lighthouse is 050°

Work out the bearing of the lighthouse from the ship.

.....°

(Total for Question 14 is 2 marks)

15 (a) Simplify $m^5 \div m^3$

.....

(1)

(b) Simplify $5x^4y^3 \times x^2y$

.....

(2)

(Total for Question 15 is 3 marks)

16 The diagram shows a triangle.

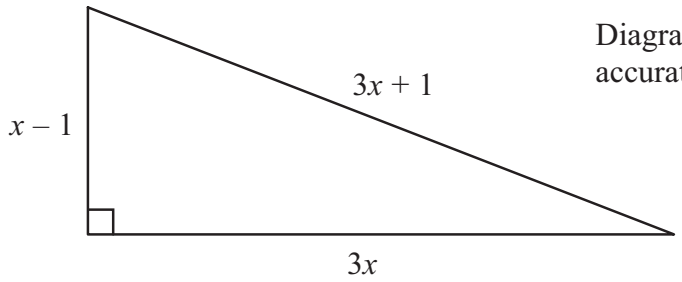


Diagram **NOT** accurately drawn

In the diagram, all the measurements are in metres.

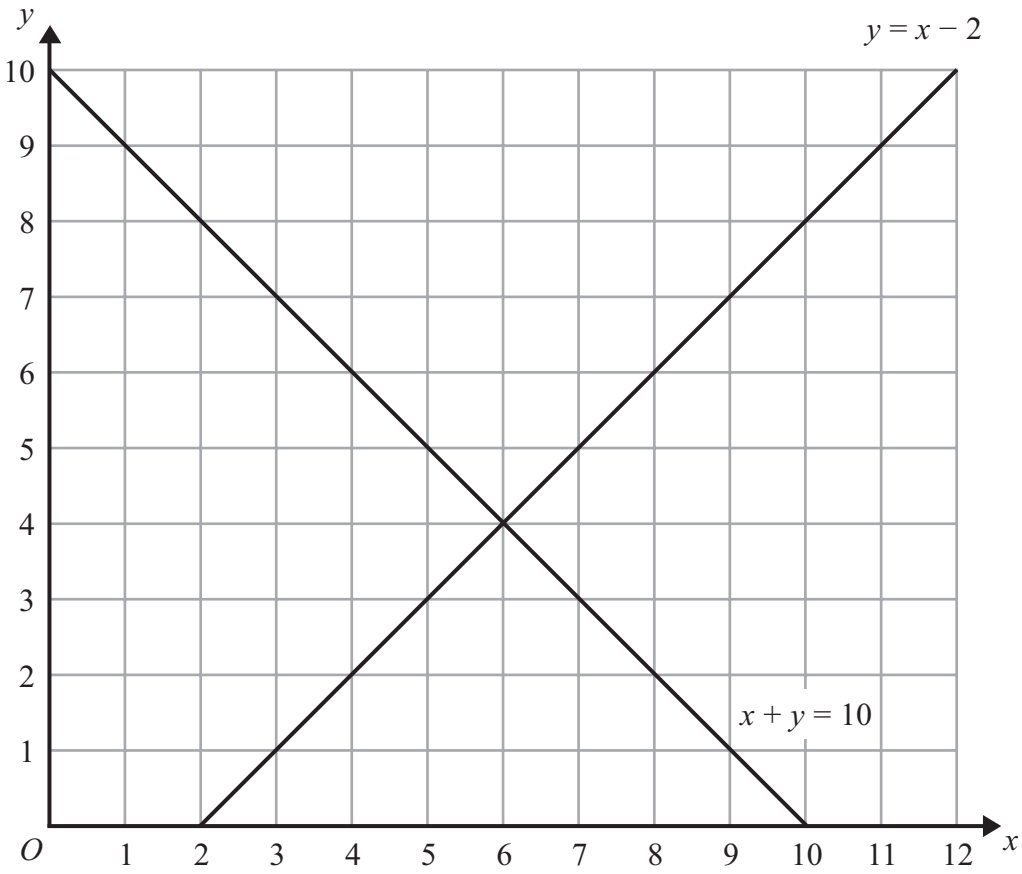
The perimeter of the triangle is 56 m.
The area of the triangle is A m^2.

Work out the value of A.

.....

(Total for Question 16 is 4 marks)

17 The lines $y = x - 2$ and $x + y = 10$ are drawn on the grid.



On the grid, mark with a cross (×) each of the points with integer coordinates that are in the region defined by

$y > x - 2$
$x + y < 10$
$x > 3$

(Total for Question 17 is 3 marks)

18 The diagram shows part of a pattern made from tiles.

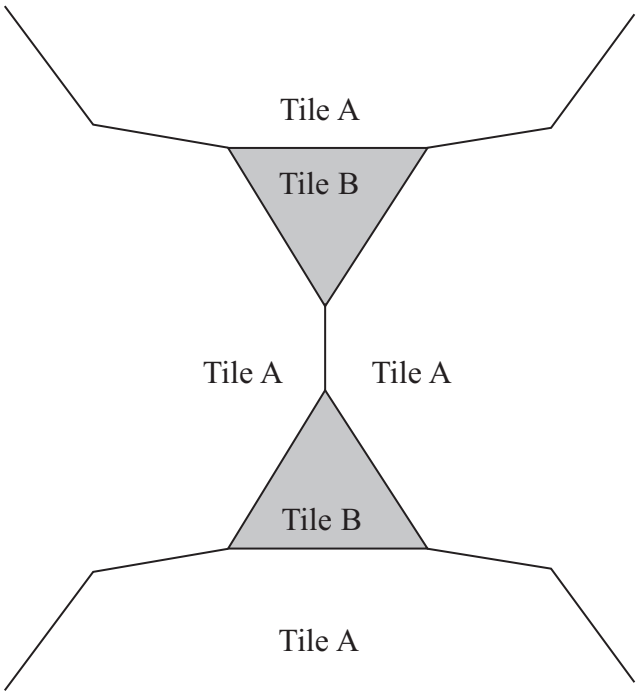


Diagram **NOT** accurately drawn

The pattern is made from two types of tiles, tile A and tile B.

Both tile A and tile B are regular polygons.

Work out the number of sides tile A has.

.....

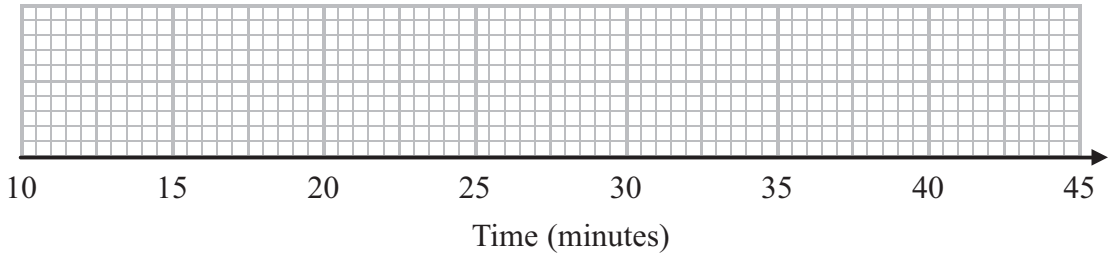
(Total for Question 18 is 4 marks)

19 Sameena recorded the times, in minutes, some girls took to do a jigsaw puzzle.

Sameena used her results to work out the information in this table.

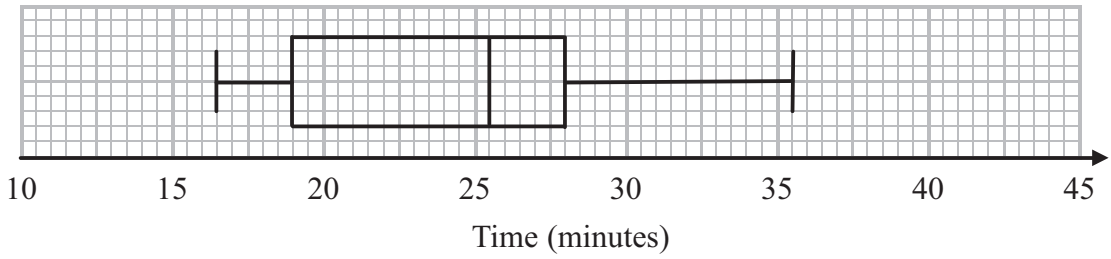
	Minutes
Shortest time	18
Lower quartile	25
Median	29
Upper quartile	33
Longest time	44

(a) On the grid, draw a box plot to show the information in the table.



(2)

The box plot below shows information about the times, in minutes, some boys took to do the same jigsaw puzzle.



(b) Compare the distributions of the girls' times and the boys' times.

.....

.....

.....

.....

(2)

(Total for Question 19 is 4 marks)

20 Write the following numbers in order of size.
Start with the smallest number.

0.038×10^{2} 3800×10^{-4} 380 0.38×10^{-1}

.....

(Total for Question 20 is 2 marks)

21 The table shows information about the speeds of 100 lorries.

Speed (s) in km/h	Frequency
$0 < s \leqslant 20$	2
$20 < s \leqslant 40$	9
$40 < s \leqslant 60$	23
$60 < s \leqslant 80$	31
$80 < s \leqslant 100$	27
$100 < s \leqslant 120$	8

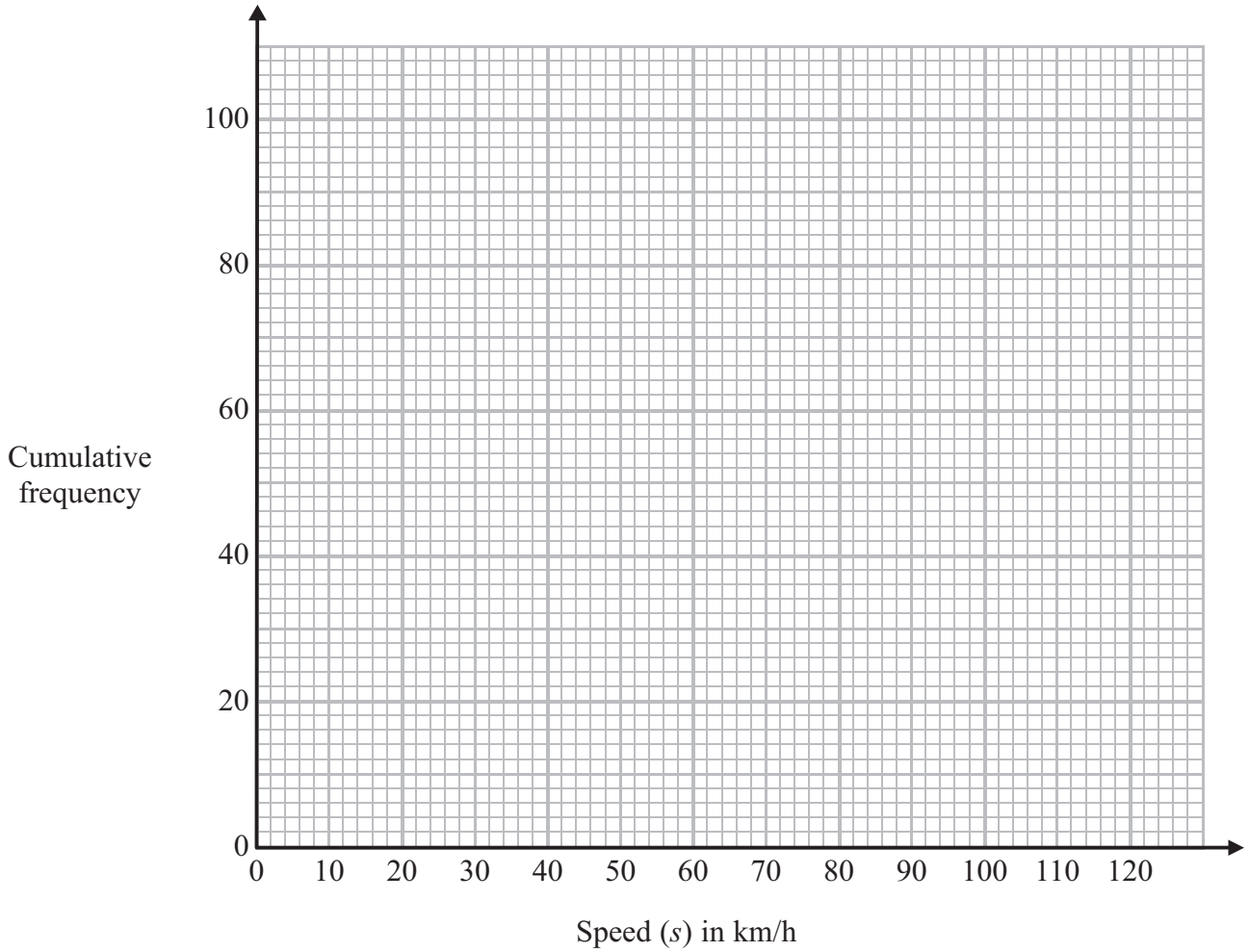
(a) Complete the cumulative frequency table for this information.

Speed (s) in km/h	Cumulative frequency
$0 < s \leqslant 20$	2
$0 < s \leqslant 40$	
$0 < s \leqslant 60$	
$0 < s \leqslant 80$	
$0 < s \leqslant 100$	
$0 < s \leqslant 120$	

(1)

(b) On the grid, draw a cumulative frequency graph for your table.

(2)



(c) Find an estimate for the number of lorries with a speed of more than 90 km/h.

.....

(2)

(Total for Question 21 is 5 marks)

22 Solve the simultaneous equations

$$3x + 2y = 4$$
$$4x + 5y = 17$$

$x =$ .....

$y =$ .....

(Total for Question 22 is 4 marks)

23

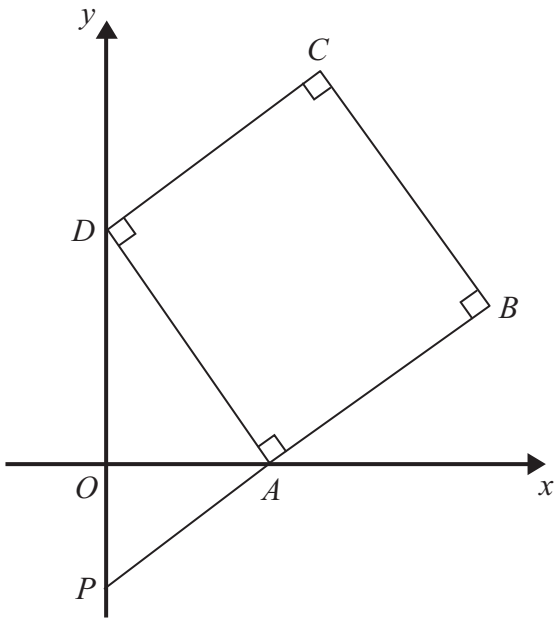


Diagram **NOT** accurately drawn

ABCD is a square.
P and *D* are points on the *y*-axis.
A is a point on the *x*-axis.
PAB is a straight line.

The equation of the line that passes through the points *A* and *D* is $y = -2x + 6$

Find the length of *PD*.

.....

(Total for Question 23 is 4 marks)

24 Make t the subject of the formula

$$p = \frac{3 - 2t}{4 + t}$$

.....

(Total for Question 24 is 4 marks)

25 The diagram shows two similar solids, A and B.

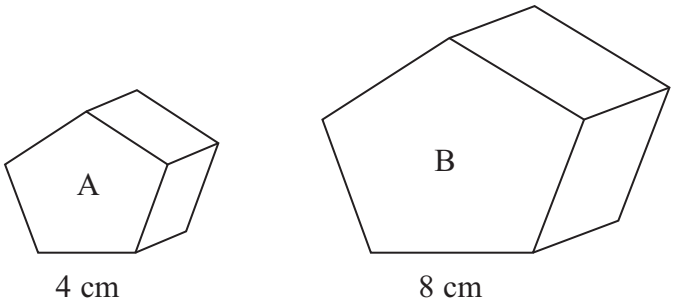


Diagram **NOT** accurately drawn

Solid A has a volume of 80 cm^3.

(a) Work out the volume of solid B.

.....cm^3

(2)

Solid B has a total surface area of 160 cm^2.

(b) Work out the total surface area of solid A.

.....cm^2

(2)

(Total for Question 25 is 4 marks)

26 (a) Rationalise the denominator of $\frac{5}{\sqrt{2}}$

.....

(2)

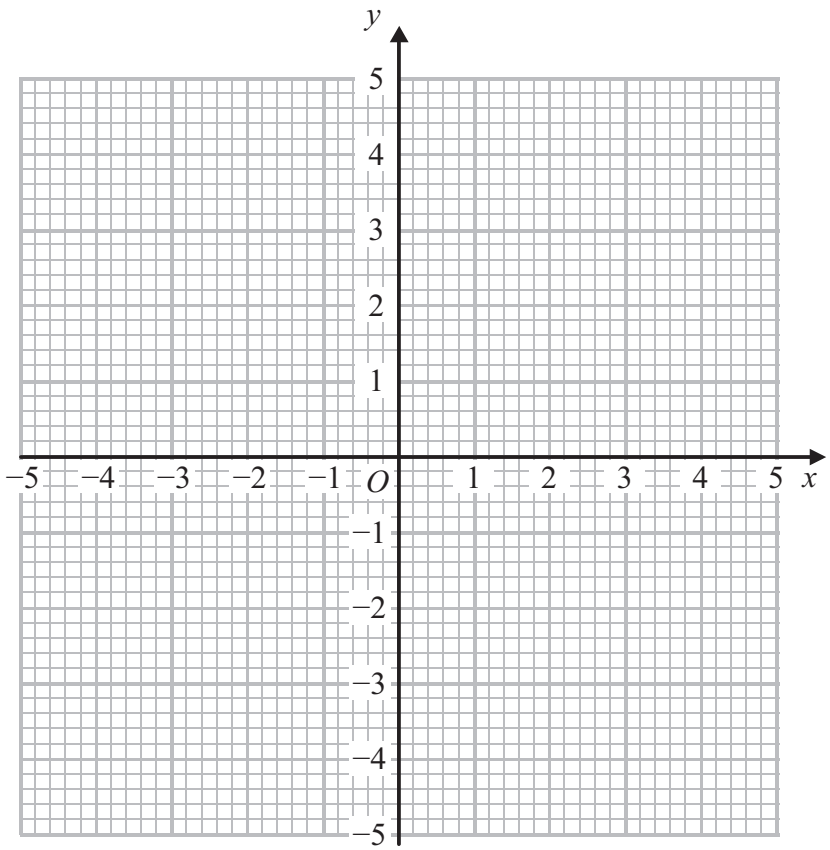
(b) Expand and simplify $(2 + \sqrt{3})^2 - (2 - \sqrt{3})^2$

.....

(2)

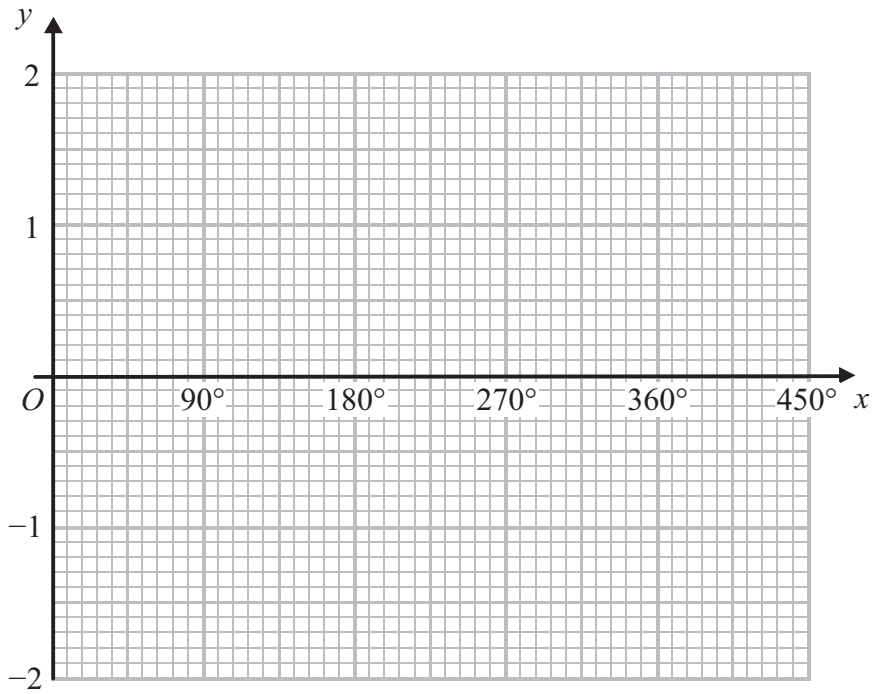
(Total for Question 26 is 4 marks)

27



(a) On the grid, draw the graph of $x^2 + y^2 = 4$

(2)



(b) On the grid, sketch the graph of $y = \cos x$ for $0° \leqslant x \leqslant 360°$

(2)

(Total for Question 27 is 4 marks)

28

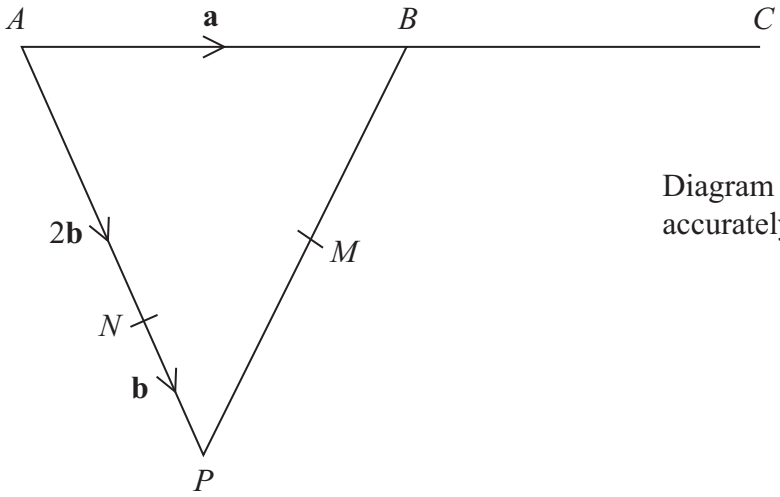


Diagram **NOT** accurately drawn

APB is a triangle.
N is a point on *AP*.

$\overrightarrow{AB} = \mathbf{a}$ $\overrightarrow{AN} = 2\mathbf{b}$ $\overrightarrow{NP} = \mathbf{b}$

(a) Find the vector $\overrightarrow{PB}$, in terms of **a** and **b**.

.....

(1)

B is the midpoint of *AC*.
M is the midpoint of *PB*.

*(b) Show that *NMC* is a straight line.

(4)

(Total for Question 28 is 5 marks)

TOTAL FOR PAPER IS 100 MARKS