41 Edexcel GCSE
Mathematics (Linear) – 1MA0
TRANSLATION

Materials required for examination
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.
Tracing paper may be used.

Items included with question papers
Nil

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 may be used.

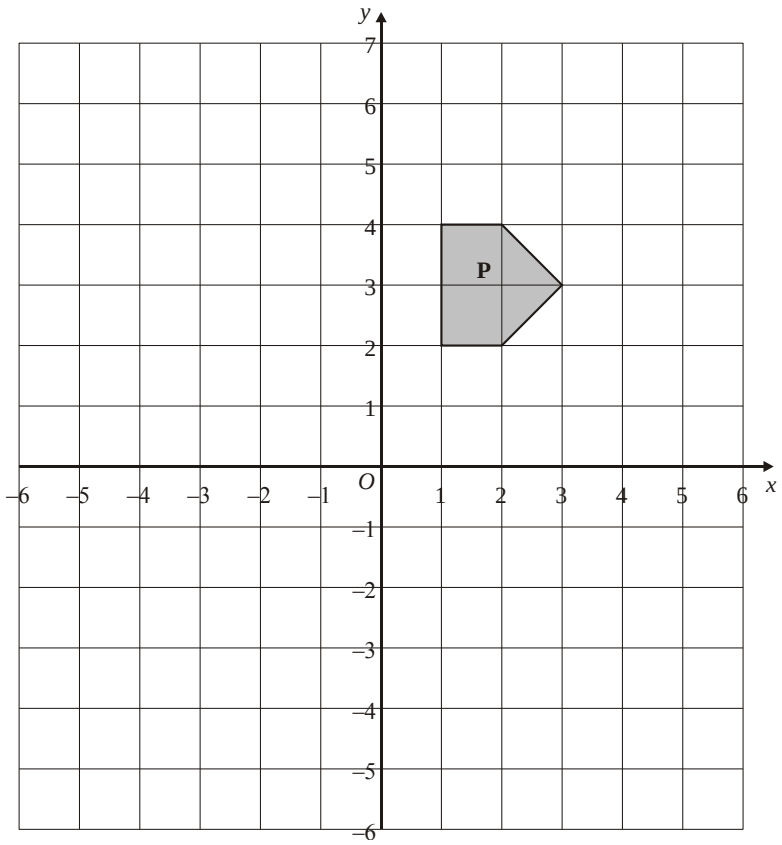
Information

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 – you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.

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.

1.

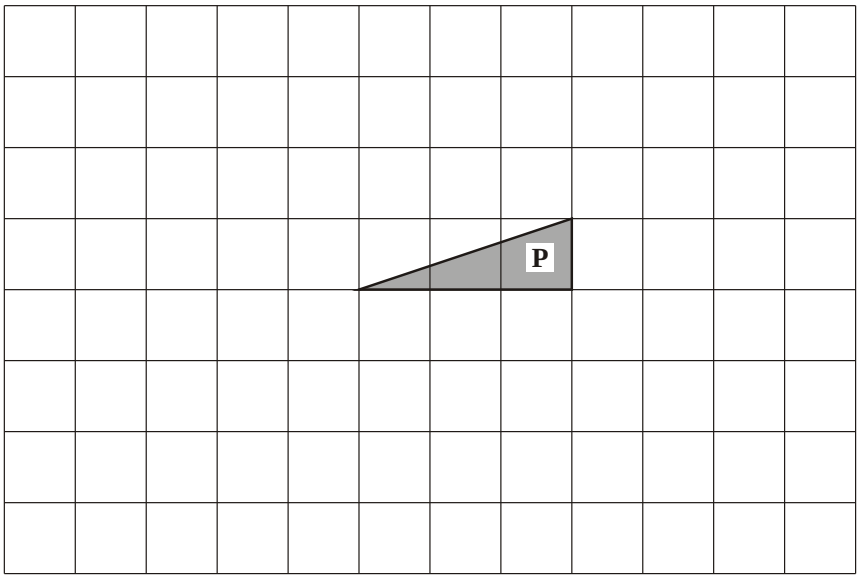


On the grid, translate the shaded shape **P** by 2 units to the right and 3 units up.

Label the new shape **R.**

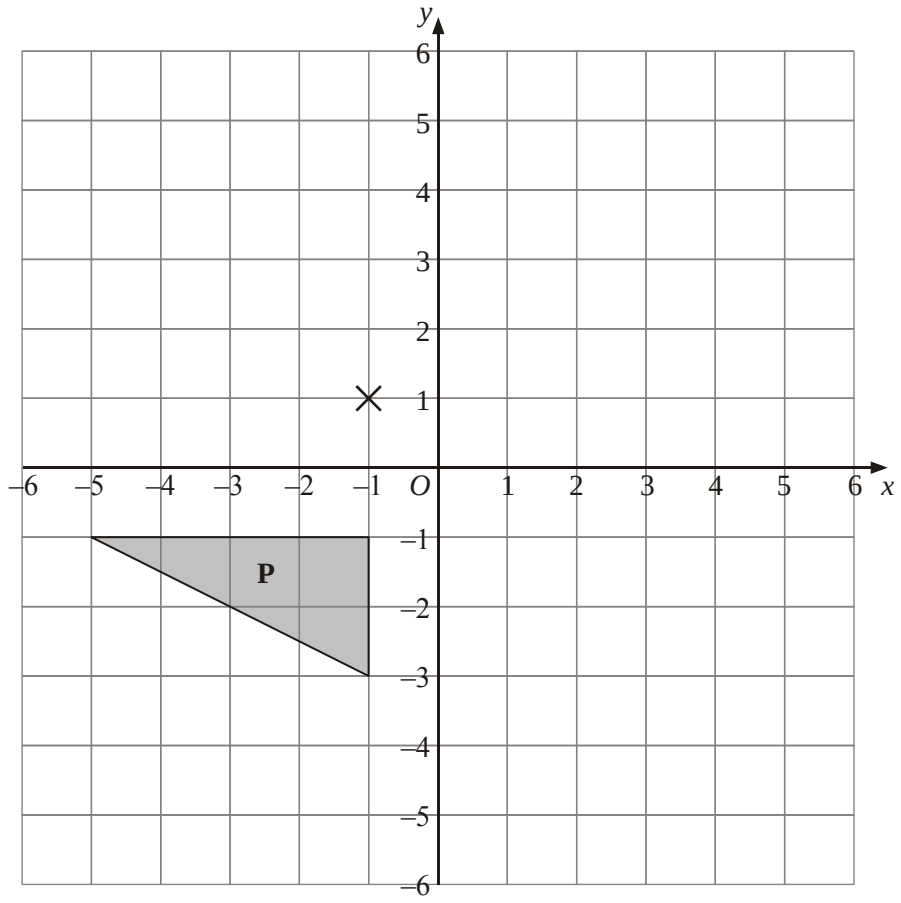
(Total 2 marks)

2. Translate shape **P** 3 squares to the left and 2 squares down.



(Total 1 mark)

3.

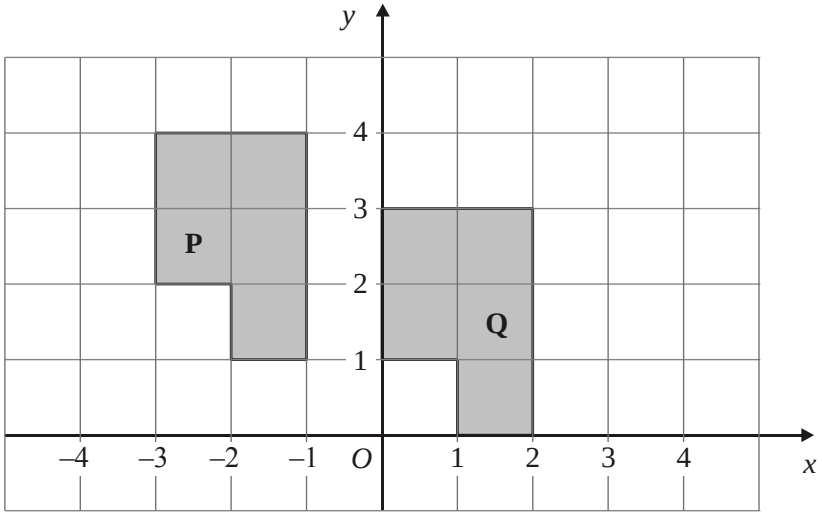


Translate triangle **P** by the vector $\begin{pmatrix} 6 \\ -1 \end{pmatrix}$.

Label the new triangle **B**.

(2)
(Total 2 marks)

4.



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

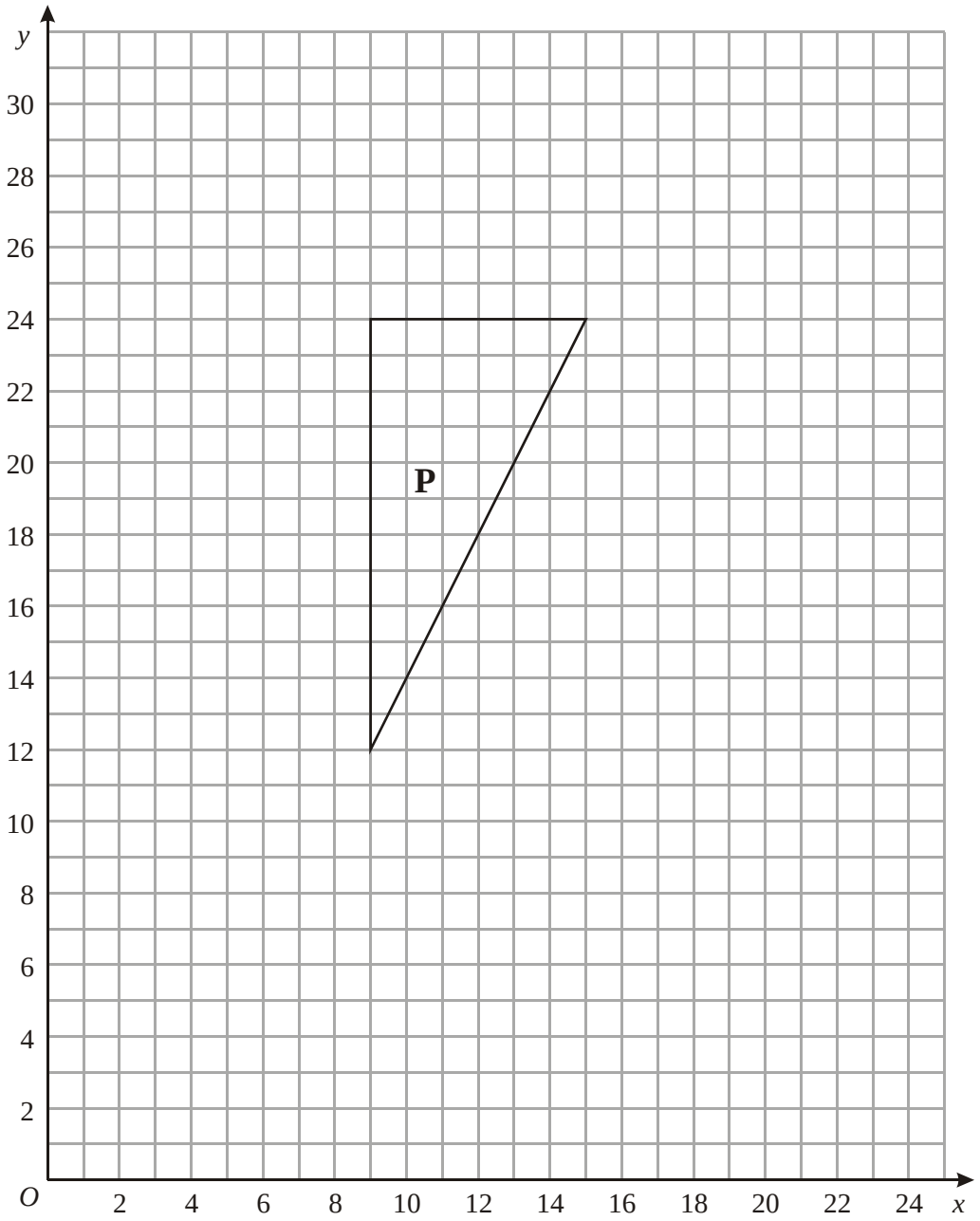
.....

.....

.....

(2)
(Total 2 marks)

5.

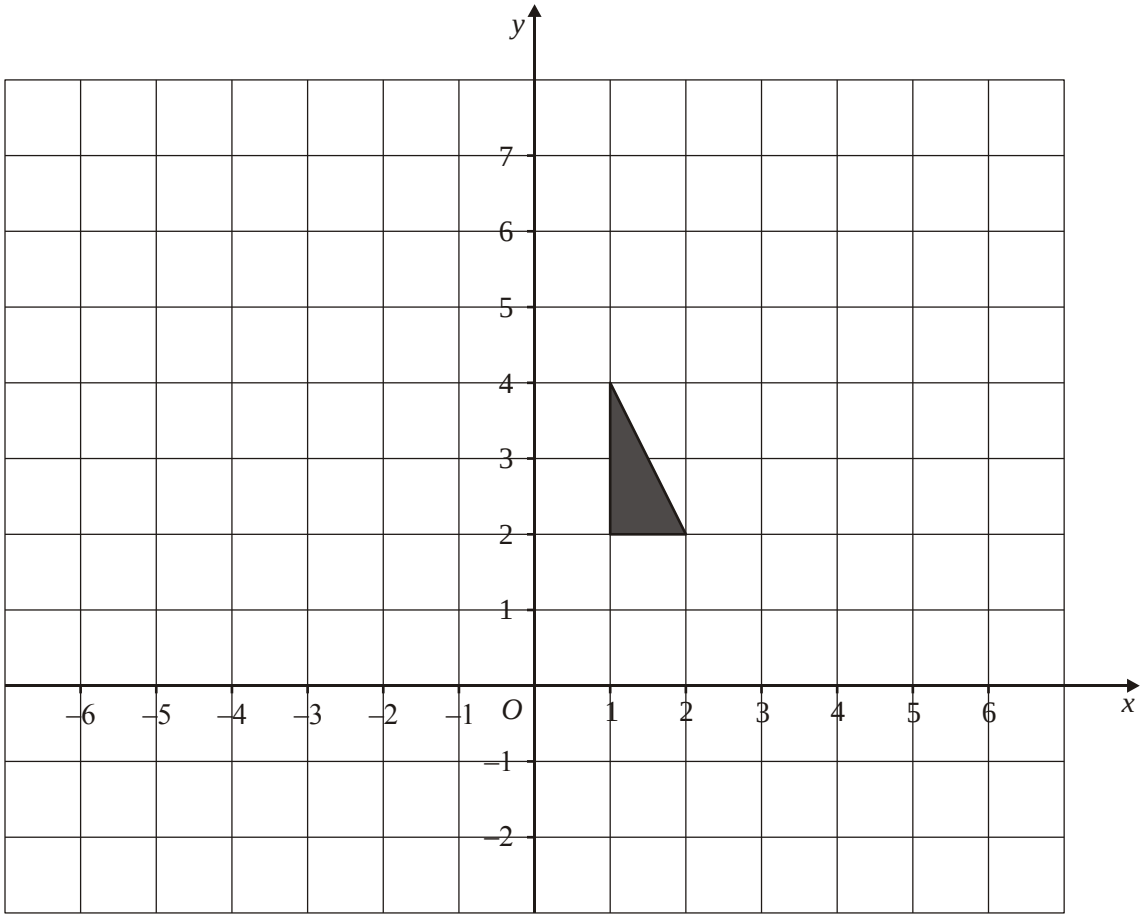


On the grid, translate triangle **P** by the vector $\begin{pmatrix} 8 \\ -3 \end{pmatrix}$

Label the new triangle **Q.**

(2)
(Total 2 marks)

6.

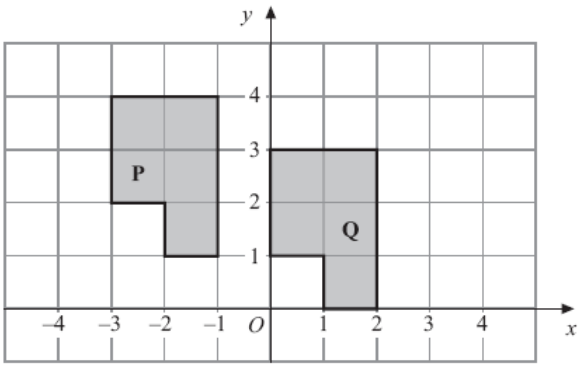


Translate the triangle by the vector

$$\begin{pmatrix} 4 \\ -3 \end{pmatrix}$$

(Total 2 mark)

7.



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

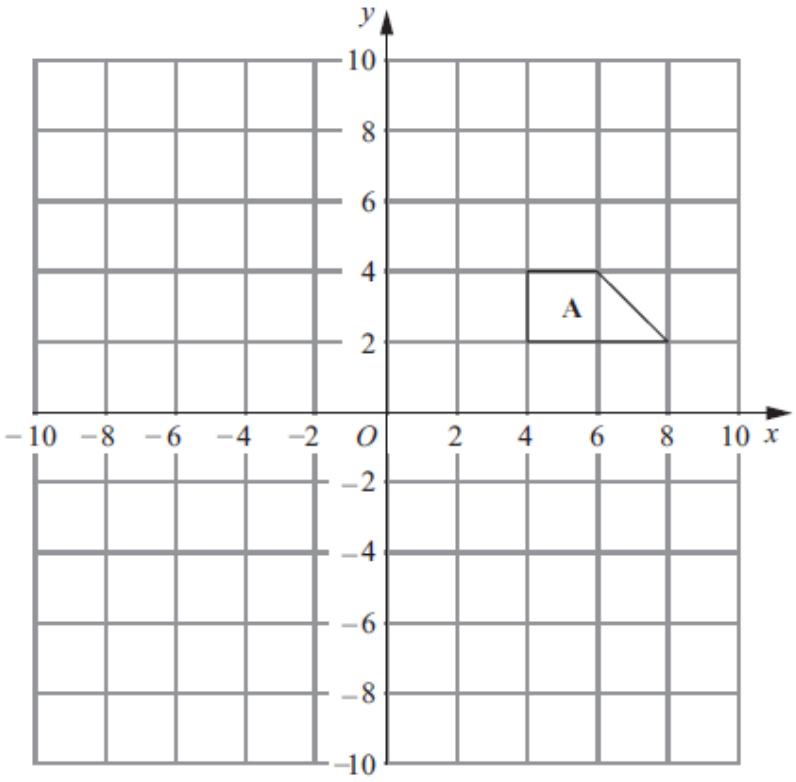
.....

.....

(2)

(Total 2 marks)

8.

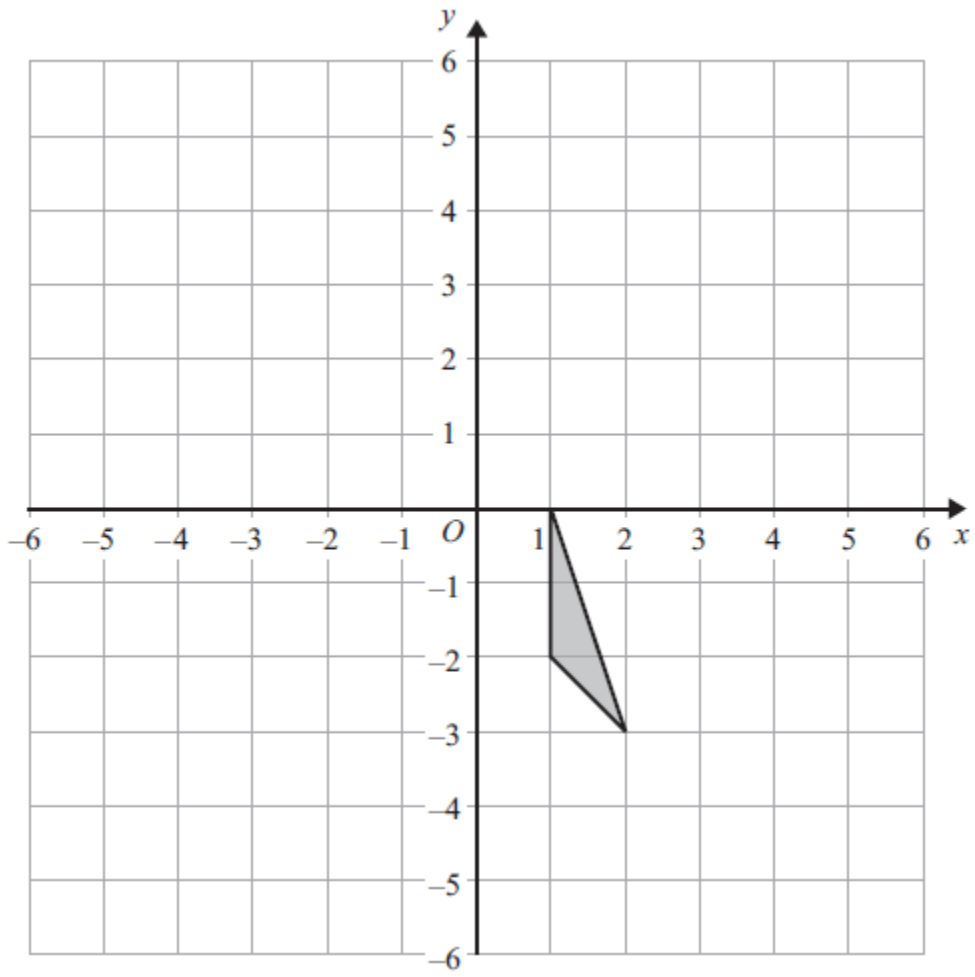


Translate shape **A** by $\begin{pmatrix} -8 \\ -2 \end{pmatrix}$.

Label the new shape **B**.

(Total 2 marks)

9.



Translate the triangle by $\begin{pmatrix} -3 \\ 2 \end{pmatrix}$

(Total 2 marks)

42 Edexcel GCSE
Mathematics (Linear) – 1MA0
MIXED TRANSFORMATIONS

Materials required for examination
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.
Tracing paper may be used.

Items included with question papers
Nil

Instructions

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Fill in the boxes at the top of this page with your name, centre number and candidate number.
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Answer the questions in the spaces provided – there may be more space than you need.
Calculators may be used.

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Advice

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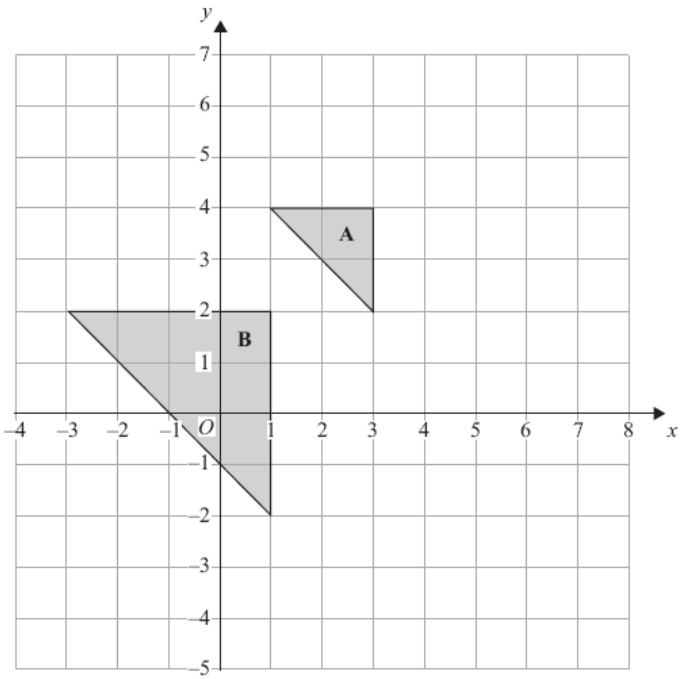
Keep an eye on the time.
Try to answer every question.
Check your answers if you have time at the end.

1.



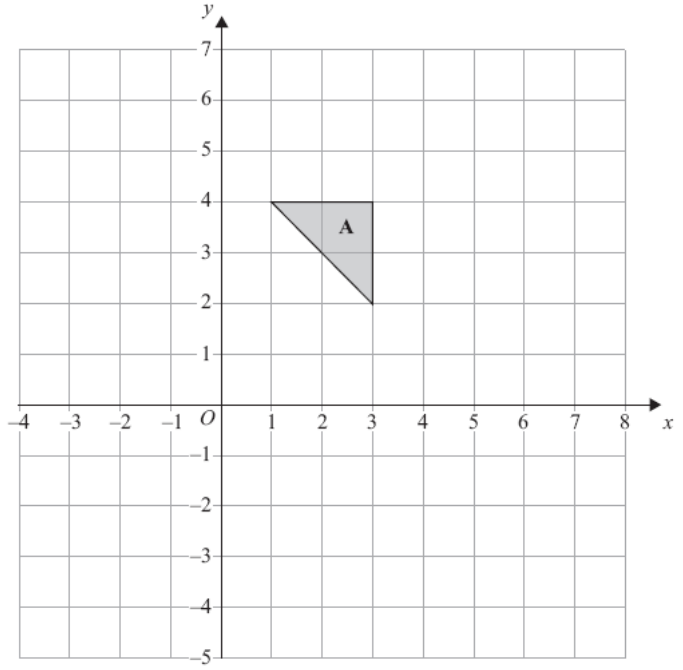
Triangle **A** and triangle **B** are drawn on the grid.

(a) Describe fully the single transformation which maps triangle **A** onto triangle **B**.

.....

.....

(3)

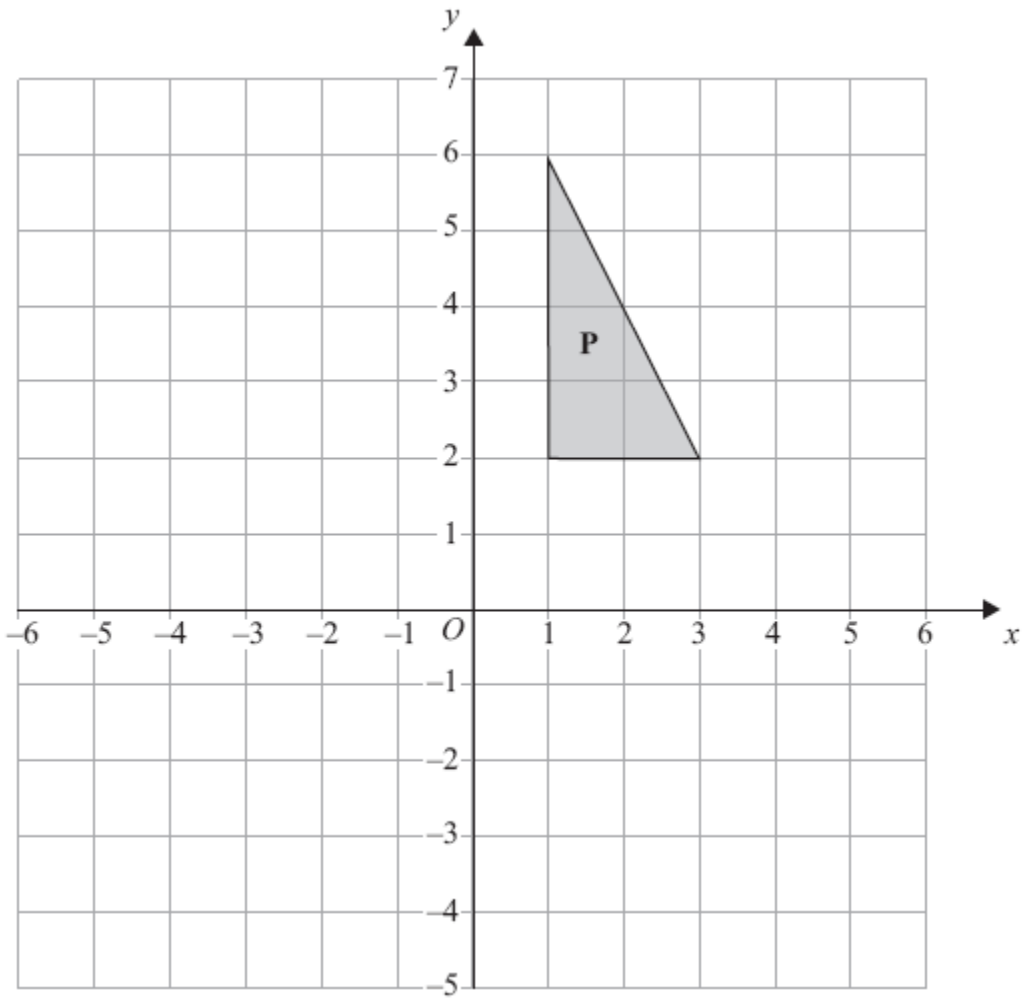


(b) Reflect triangle **A** in the line $x = 4$

(2)

(5 marks)

2.



Triangle **P** is drawn on a coordinate grid.

The triangle **P** is reflected in the line $x = -1$ and then reflected in the line $y = 1$ to give triangle **Q**.

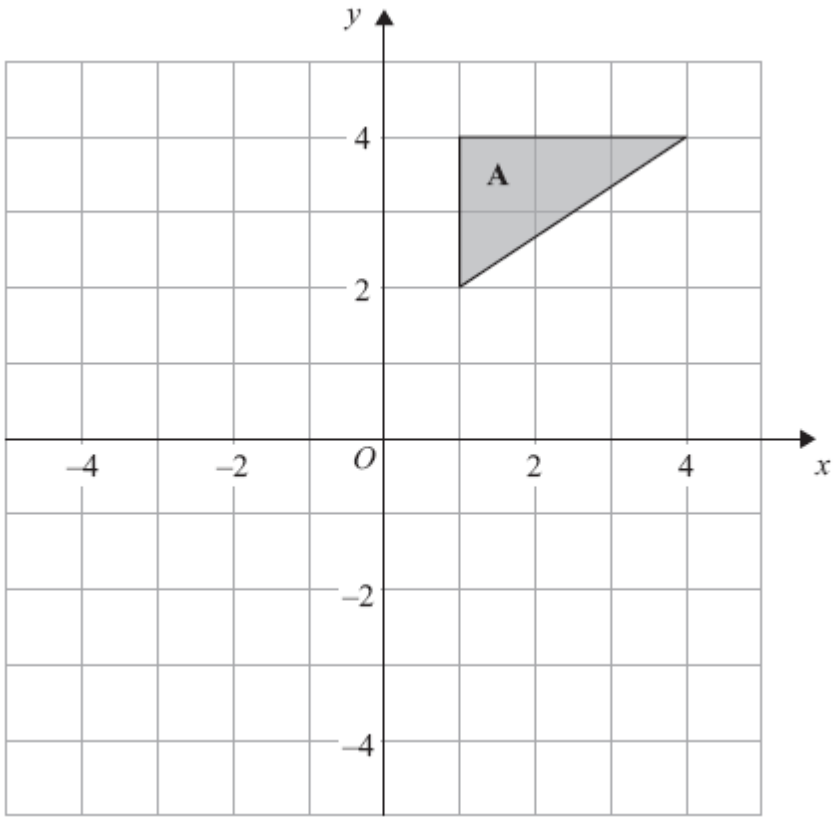
Describe fully the single transformation which maps triangle **P** onto triangle **Q**.

.....

.....

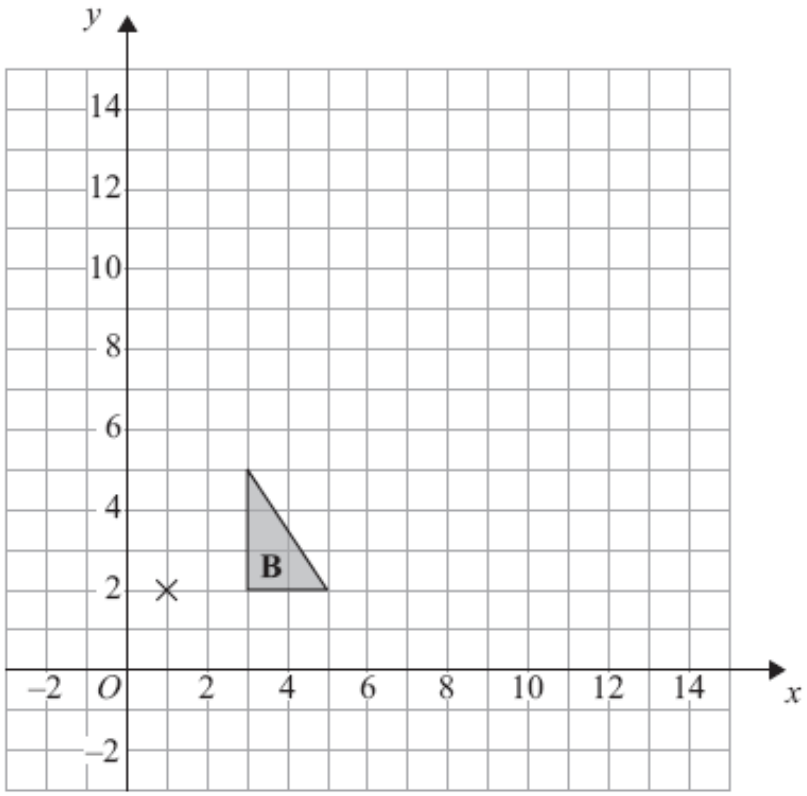
(3 marks)

3.



(a) Rotate triangle **A** 90° clockwise, centre *O*.

(2)

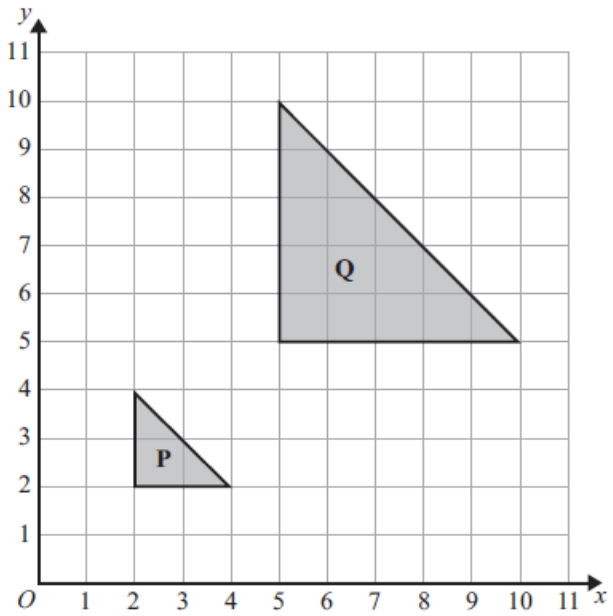


(b) Enlarge triangle **B** by scale factor 3, centre (1, 2).

(3)

(5 marks)

4.



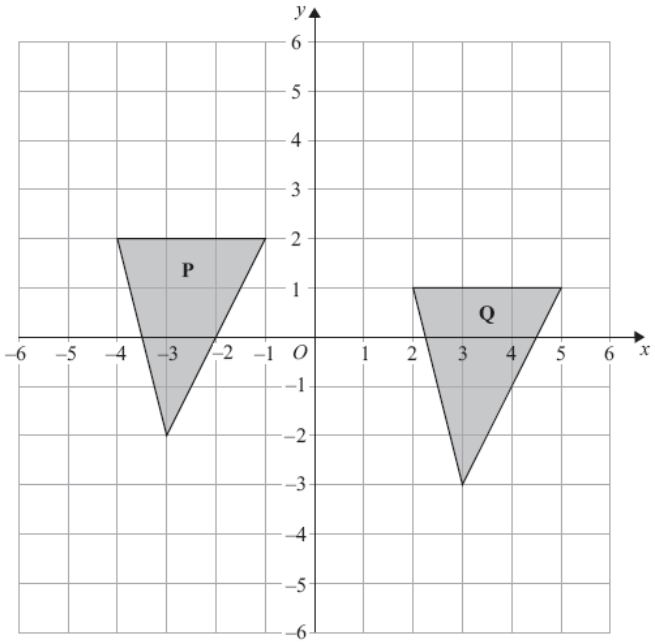
Describe fully the single transformation that maps shape **P** onto shape **Q**.

.....

.....

(3 marks)

5.



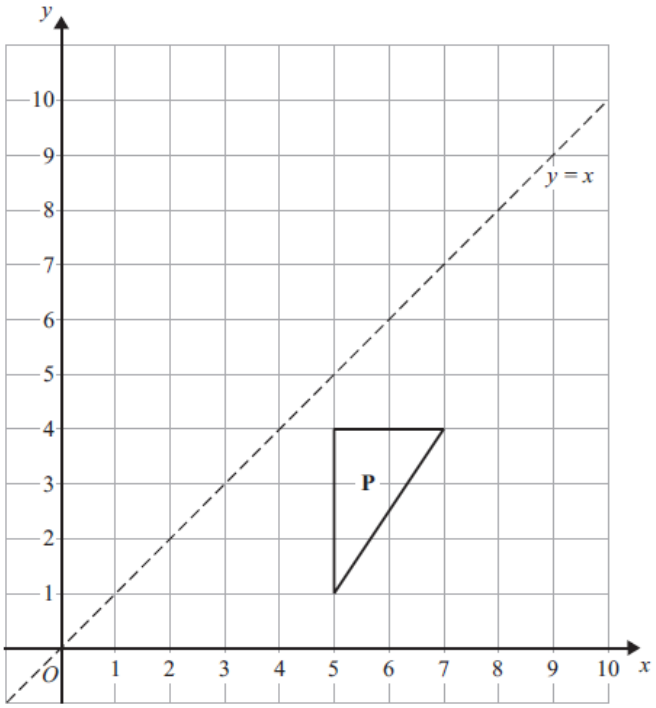
Describe fully the single transformation that maps triangle **P** onto triangle **Q**.

.....

.....

(3 marks)

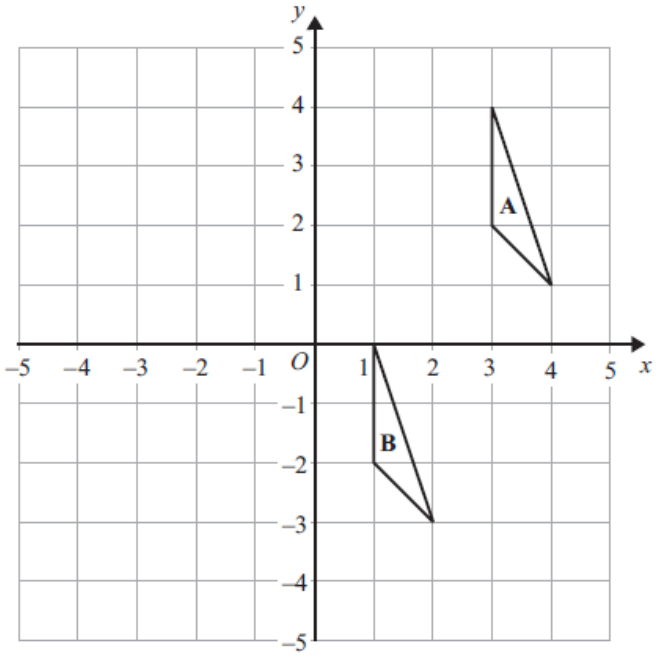
6. (a)



Reflect shape **P** in the line $y = x$

(2)

(b)



Describe fully the single transformation that maps triangle **A** onto triangle **B**.

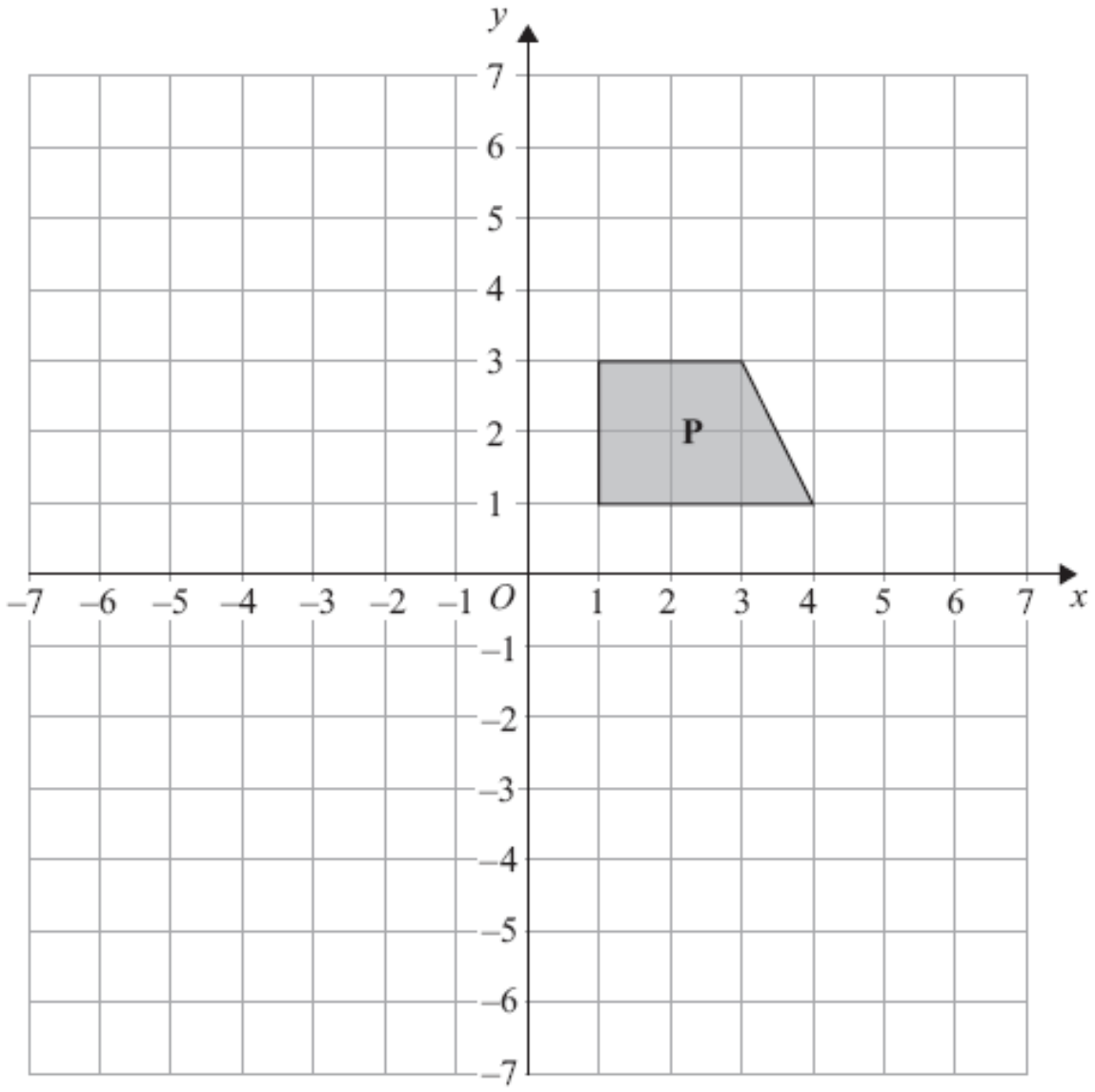
.....

.....

(2)

(4 marks)

7.



Shape **P** is reflected in the line $x = -1$ to give shape **Q**.

Shape **Q** is reflected in the line $y = 0$ to give shape **R**.

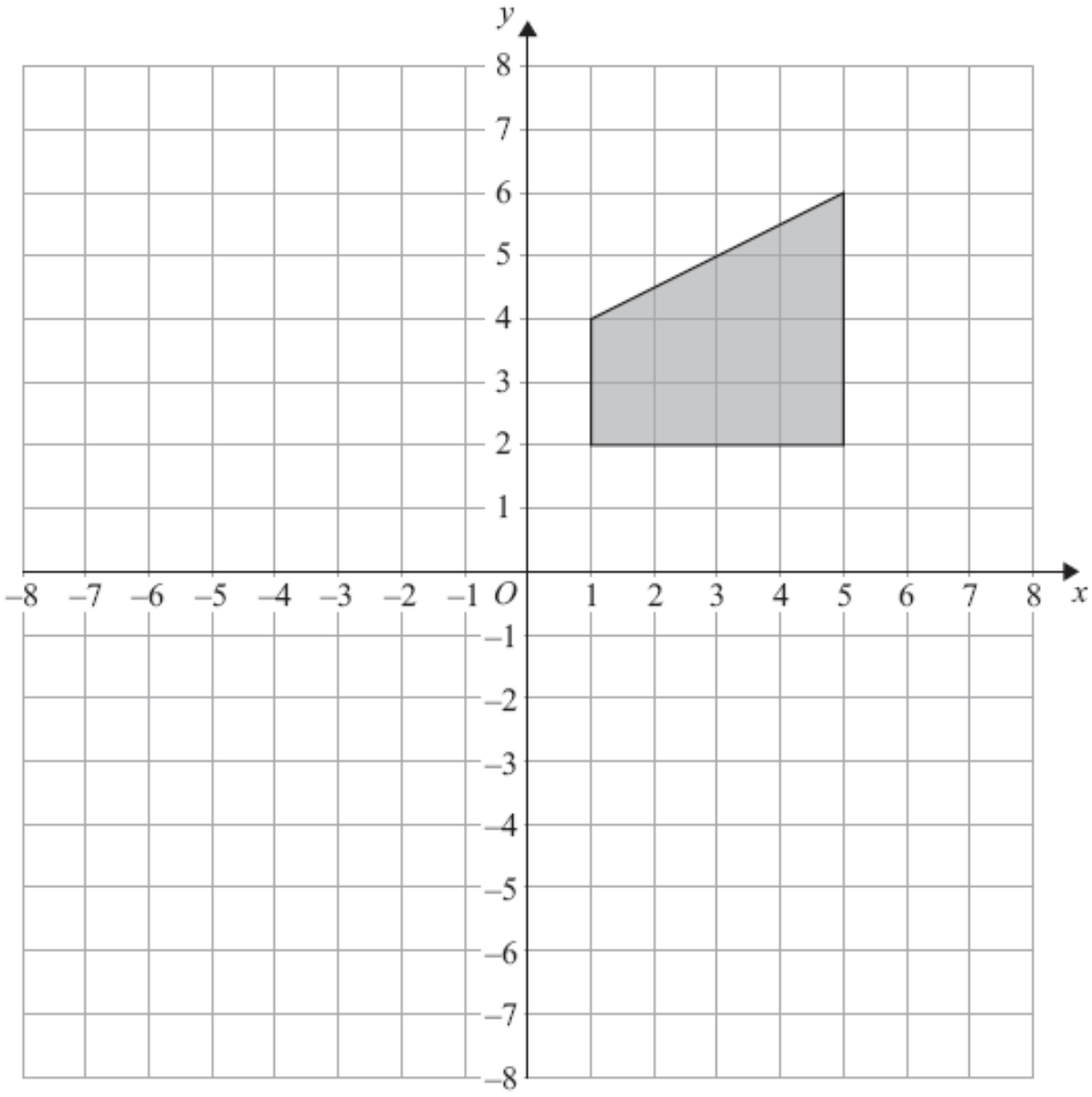
Describe fully the **single** transformation that maps shape **P** onto shape **R**.

.....

.....

(3 marks)

8.



Rotate the shaded shape 90^0 clockwise about the point (1, -1).

(3 marks)

43 Edexcel GCSE
Mathematics (Linear) – 1MA0

NETS, PLANS & ELEVATIONS

Materials required for examination
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.
Tracing paper may be used.

Items included with question papers
Nil

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.
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Answer the questions in the spaces provided – there may be more space than you need.
Calculators may be used.

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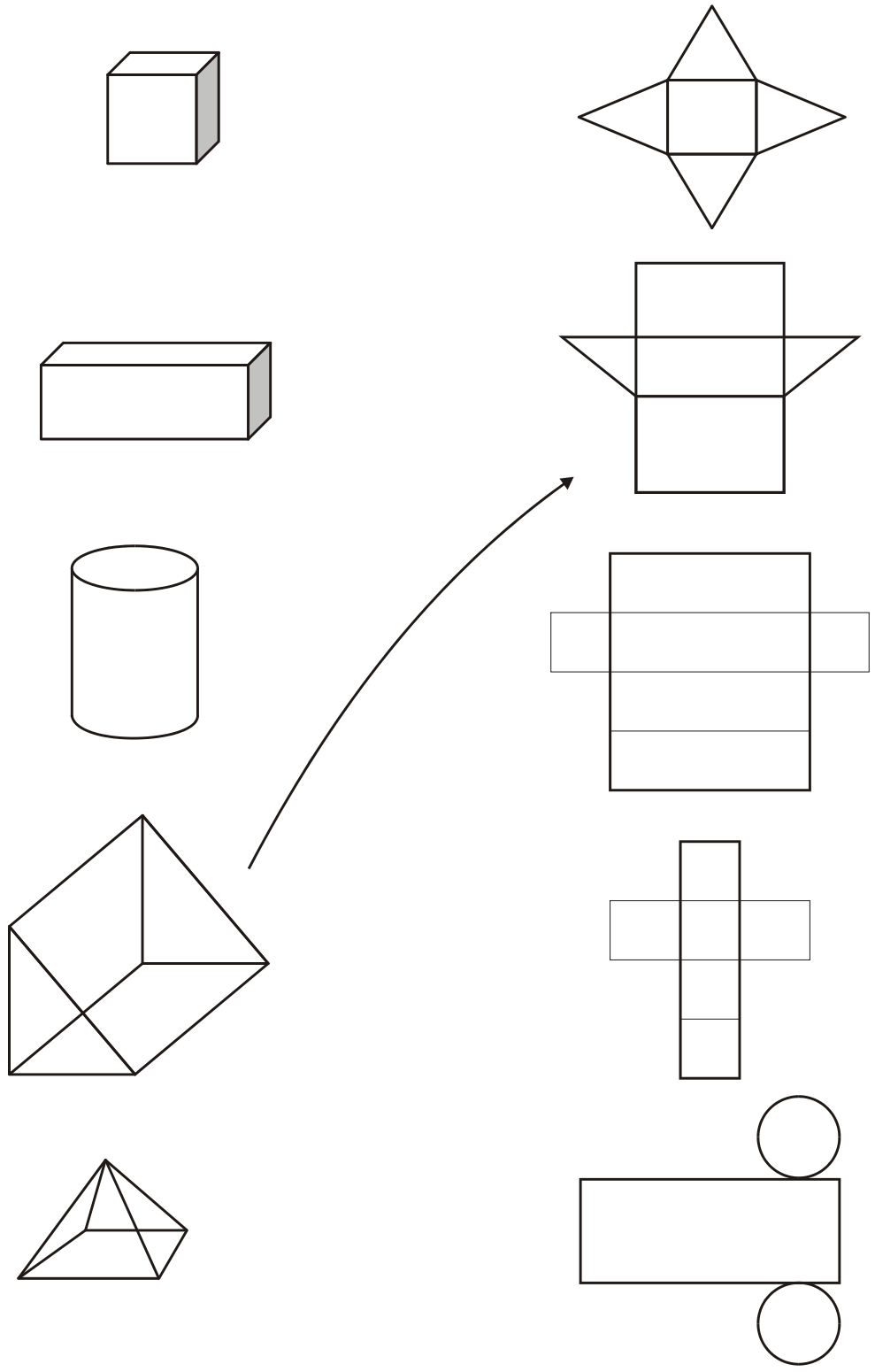
Advice

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.

1. The diagrams show some solid shapes and their nets.
An arrow has been drawn from one solid shape to its net.

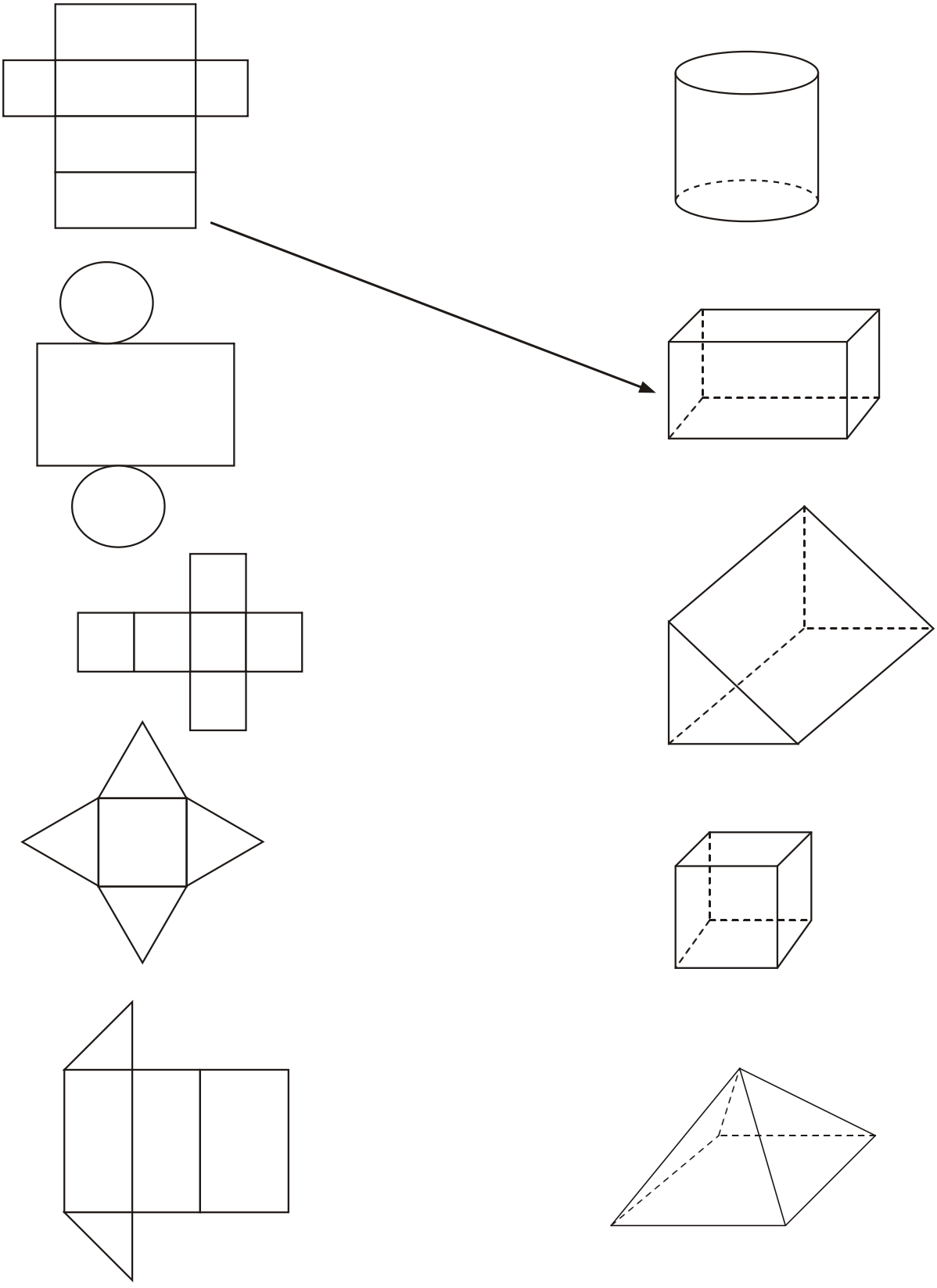
Draw an arrow from each of the other solid shapes to its net.



(3 marks)

2. The diagram shows some nets and some solid shapes.
An arrow has been drawn from one net to its solid shape.

Draw an arrow from each of the other nets to its solid shape.

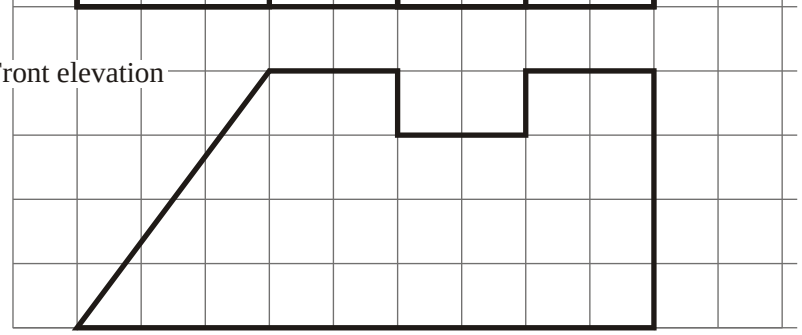


(3 marks)

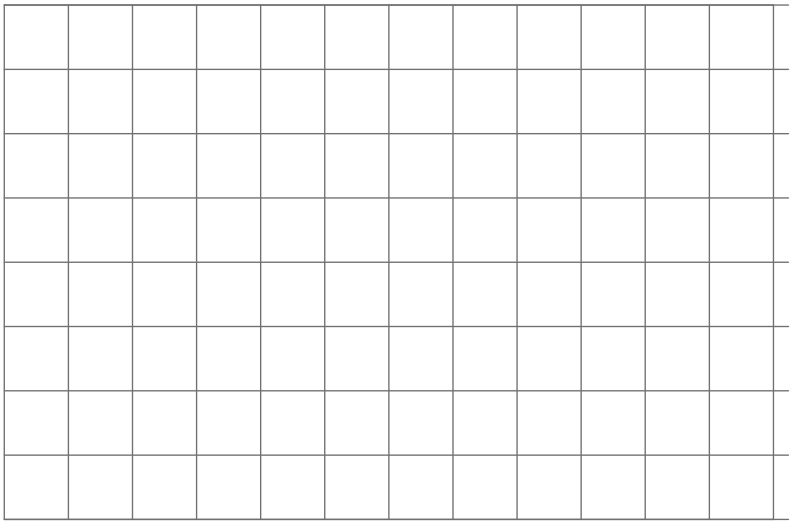
3. Here are the plan and front elevation of a prism.
The front elevation shows the cross section of the prism.

Plan

Front elevation



On the grid below, draw a side elevation of the prism.



(3)
(Total 3 marks)

4. The diagram shows a sketch of a solid object.
The solid object is made from five centimetre cubes.

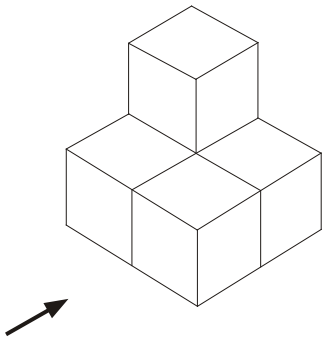
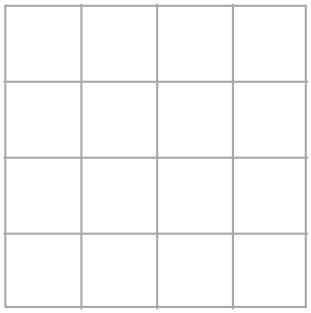


Diagram **NOT** accurately drawn

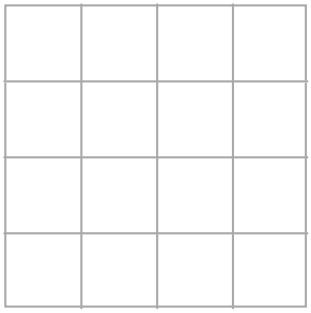
(a) On the grid of centimetre squares, draw the elevation of the solid object in the direction marked with an arrow.



Elevation

(2)

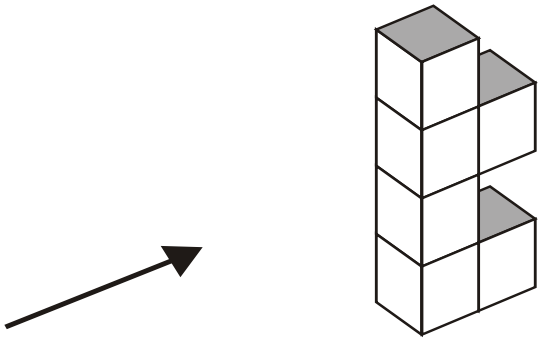
(b) On the grid of centimetre squares, draw the plan of the solid object.



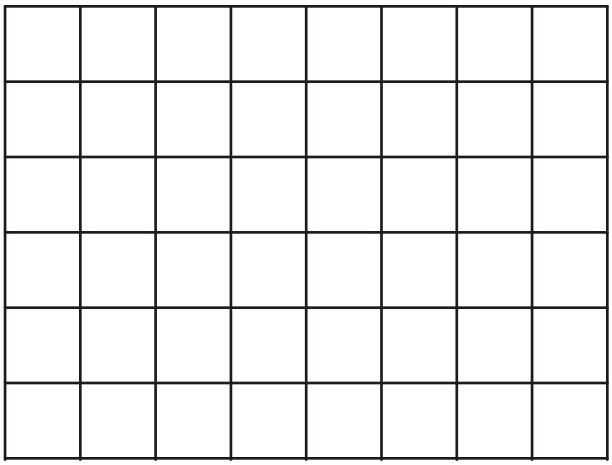
Plan

(2)
(Total 4 marks)

5. The diagram shows a solid object made of 6 identical cubes.

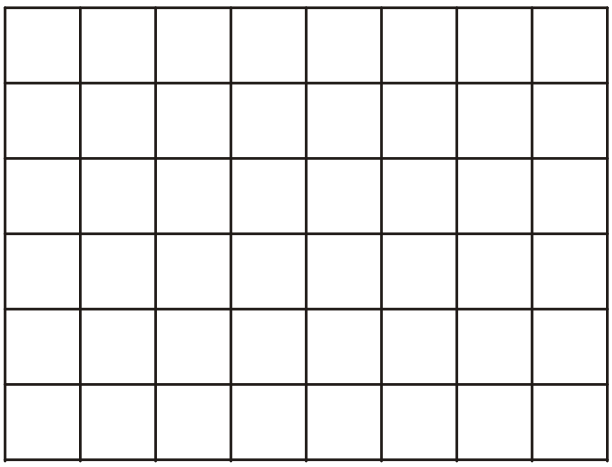


(a) On the grid below, draw the side elevation of the solid object from the direction of the arrow.



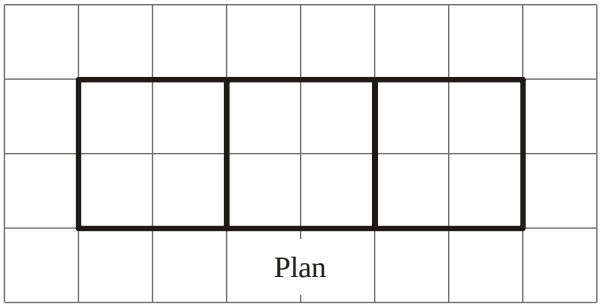
(2)

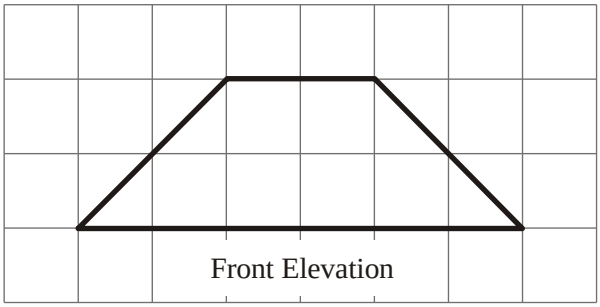
(b) On the grid below, draw the plan of the solid object.



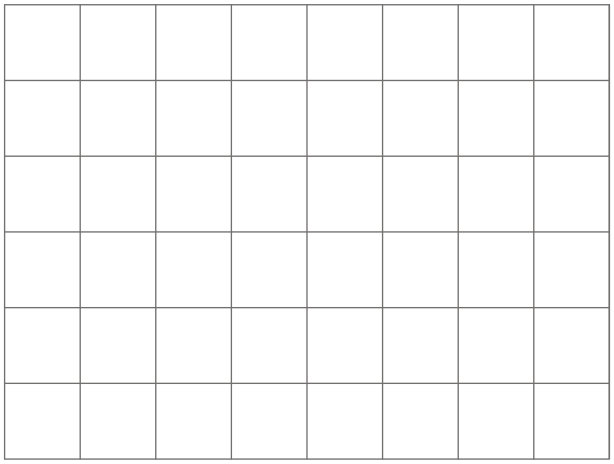
(2)
(Total 4 marks)

6. Here are the plan and front elevation of a solid shape.





(a) On the grid below, draw the side elevation of the solid shape.

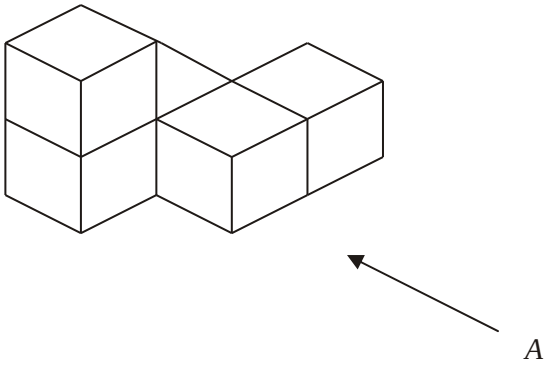


(2)

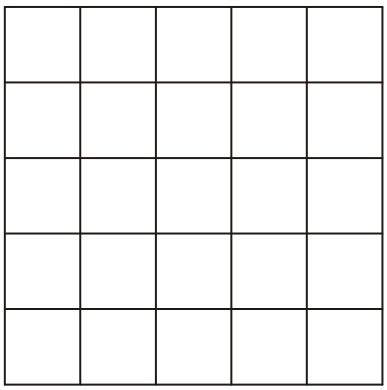
(b) In the space below, draw a sketch of the solid shape.

(2)
(Total 4 marks)

7. The diagram represents a solid made from 5 identical cubes.



On the grid below, draw the view of the solid from direction *A*.



(Total 2 marks)

44 Edexcel GCSE
Mathematics (Linear) – 1MA0

SYMMETRY

Materials required for examination
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.
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Items included with question papers
Nil

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Advice

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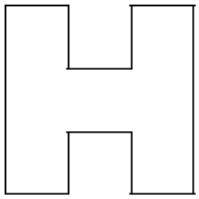
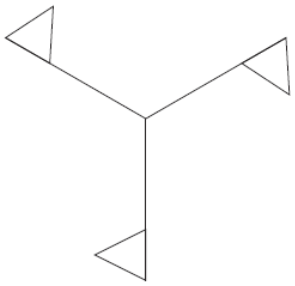
1. (a) On the shape, draw all the lines of symmetry.



(2)

The shape below has rotational symmetry.

(b) Write down the order of rotational symmetry.



.....

(1)

(Total 3 marks)

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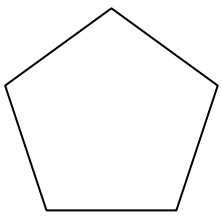
2. Here is a rectangle.

(a) Draw all the lines of symmetry of this rectangle.

(2)

Here is a regular pentagon.

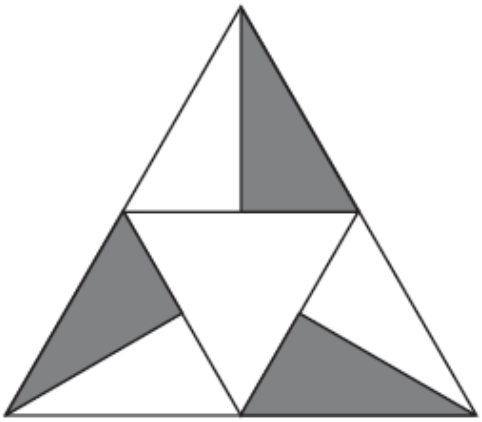


(a) Write down the order of rotational symmetry of this regular pentagon.

.....

(1)

Here is a shape.



(b) Write down the order of rotational symmetry of this shape.

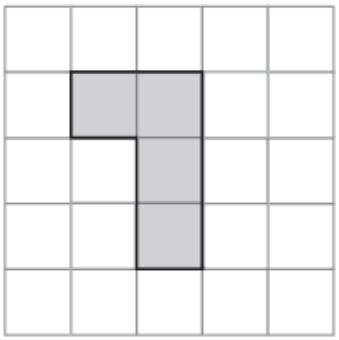
.....

(1)

(Total 4 marks)

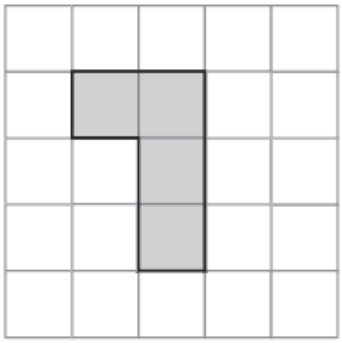
---

3. (a) Shade **one** more square to make a pattern with 1 line of symmetry.



(1)

(b) Shade **one** more square to make a pattern with rotational symmetry of order 2



(1)

(Total 2 marks)

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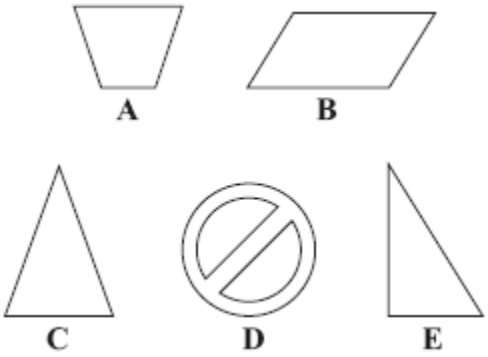
4. Here are five shapes.



Two of these shapes have only **one** line of symmetry.

(a) Write down the letter of each of these **two** shapes.

..... and .....
(2)

Two of these shapes have rotational symmetry of order 2

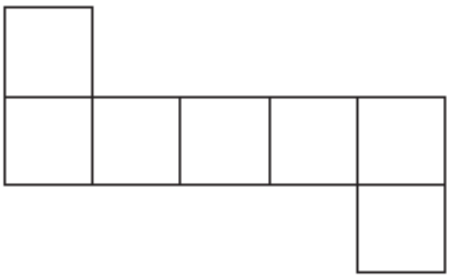
(b) Write down the letter of each of these **two** shapes.

..... and .....
(2)

(Total 4 marks)

---

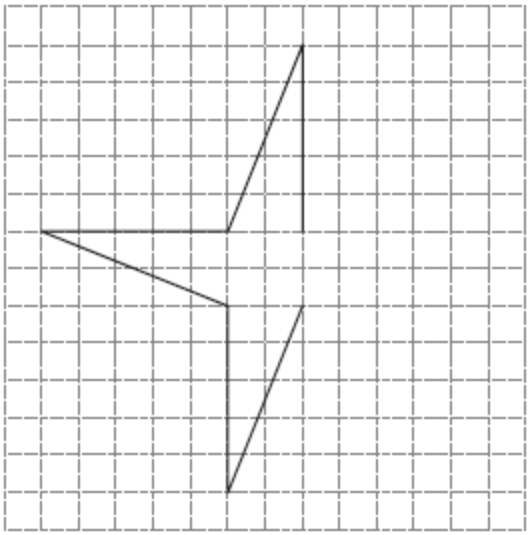
5. (a) This shape has rotational symmetry.



Mark with a cross (×) the centre of rotation.

(1)

(b)



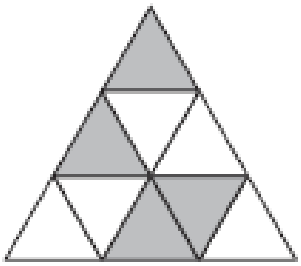
Complete this shape so that it has rotational symmetry of order 4

(1)

(Total 2 marks)

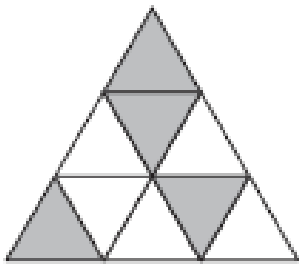
---

6. (a) Shade **two** more triangles to make a pattern with 1 line of symmetry.



(1)

(b) Shade **two** more triangles to make a pattern with rotational symmetry of order 3

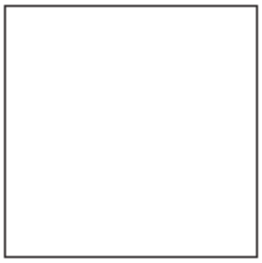


(1)

(Total 2 marks)

---

7. Here is a square.



(a) On the square, draw all the lines of symmetry.

(2)

Here is a rectangle.

(b) Write down the order of rotational symmetry of the rectangle.

.....

(1)

(Total 3marks)

---

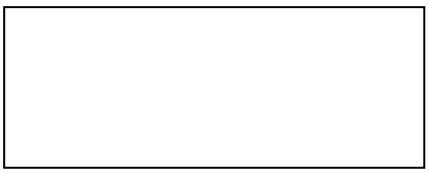
8. Here is a parallelogram.

(a) Write down the order of rotational symmetry of the parallelogram.

(1)

.....

Here is a rectangle.



(b) On the rectangle, draw all the lines of symmetry.

(1)

(Total 2 marks)

9. Here are four road signs.

A

B

C

D

Two of these road signs have one line of symmetry.

(a) Write down the letters of each of these **two** road signs.

..... and .....

(2)

Only **one** of these four road signs has rotational symmetry.

(b) (i) Write down the letter of this road sign. .....

(ii) Write down its order of rotational symmetry. ……

(2)

(Total 4 marks)

---

10. Here is a shape.

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

(2)

Here is a regular hexagon.

(b) Write down the order of rotational symmetry of this regular hexagon.

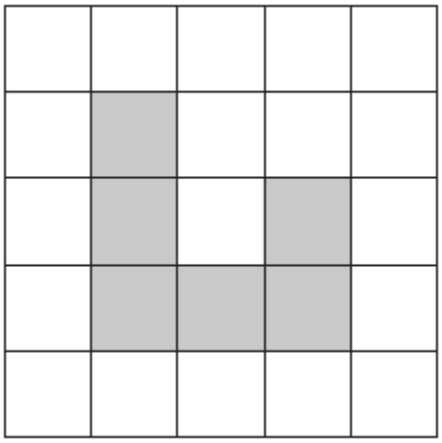
.....

(1)

(Total 3 marks)

---

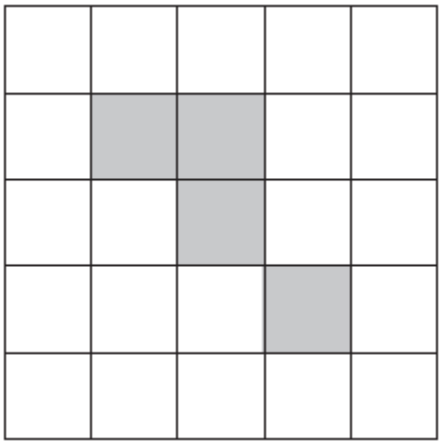
11. (a)



Shade **one** more square to make a pattern with 1 line of symmetry.

(1)

(b)



Shade **one** more square to make a pattern with rotational symmetry of order 2

(1)

(Total 2 marks)

---

45 Edexcel GCSE
Mathematics (Linear) – 1MA0

TWO WAY TABLES

Materials required for examination
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.
Tracing paper may be used.

Items included with question papers
Nil

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 may be used.

Information

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 – you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.

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.

1. The two-way table shows some information about the number of students in a school.

	Year Group			**Total**
	9	**10**	**11**	
Boys			125	407
Girls		123		
Total	303	256		831

Complete the two-way table.

(3 marks)

2. A factory makes three sizes of bookcase.
The sizes are small, medium and large.

Each bookcase can be made from pine or oak or yew.

The two-way table shows some information about the number of bookcases the factory makes in one week.

	Small	Medium	Large	Total
Pine	7			23
Oak		16		34
Yew	3	8	2	13
Total	20		14	

Complete the two-way table.

(3 marks)

3. The two-way table gives some information about how 100 children travelled to school one day.

	Walk	Car	Other	Total
Boy	15		14	54
Girl		8	16	
Total	37			100

(a) Complete the two-way table.

(3)

One of the children is picked at random.

(b) Write down the probability that this child walked to school that day.

.....

(1)

One of the girls is picked at random.

(c) Work out the probability that this girl did **not** walk to school that day.

.....

(2)

(6 marks)

---

4. The two-way table gives some information about how 100 children travelled to school one day.

	Walk	Car	Other	Total
Boy	15		14	54
Girl		8	16	
Total	37			100

(a) Complete the two-way table.

(3)

One of the children is picked at random.

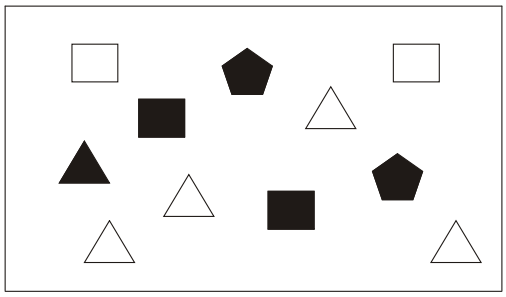
(b) Write down the probability that this child walked to school that day.

.....

(1)

(4 marks)

5.



The diagram shows some 3-sided, 4-sided and 5-sided shapes.

The shapes are black or white.

(a) Complete the two-way table. **(3)**

	Black	White	Total
3-sided shape		4	5
4-sided shape	2		
5-sided shape		0	
Total			11

Ed takes a shape at random.

(b) Write down the probability the shape is white **and** 3-sided.

.....

(2)

(5 marks)

---

6. The two-way table shows some information about the number of boys, girls and teachers at three schools.

	School A	**School B**	**School C**	**Total**
Boys	85	29	54	
Girls		31	47	171
Teachers	13	5		
Total	191			366

Complete the two-way table.

(4 marks)

---

7. 80 children went on a school trip.
They went to London or to York.

23 boys and 19 girls went to London.
14 boys went to York.

(a) Use this information to complete the two-way table.

	London	**York**	**Total**
Boys			
Girls			
Total			

(3)

One of these 80 children is chosen at random.

(b) What is the probability that this child went to London?

.....

(1)

(4 marks)

8. Felicity asked 100 students how they came to school one day.
Each student walked or came by bicycle or came by car.

49 of the 100 students are girls.
10 of the girls came by car.
16 boys walked.
21 of the 41 students who came by bicycle are boys.

Work out the total number of students who walked to school.

.....

(4 marks)

9. Janice asks 100 students if they like biology or chemistry or physics best.

38 of the students are girls.
21 of these girls like biology best.
18 boys like physics best.
7 out of the 23 students who like chemistry best are girls.

Work out the number of students who like biology best.

.....

(4 marks)

10. 56 students were asked if they watched tennis yesterday.
20 of the students are boys.
17 girls watched tennis yesterday.
32 students did not watch tennis yesterday

One of these students is to be chosen at random.

Write down the probability that the student chosen will be a boy who watched tennis yesterday.
Give your answer as a fraction in its simplest form.

.....

(4 marks)

46 Edexcel GCSE
Mathematics (Linear) – 1MA0

PIE CHARTS

Materials required for examination
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.
Tracing paper may be used.

Items included with question papers
Nil

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 may be used.

Information

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Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed – you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.

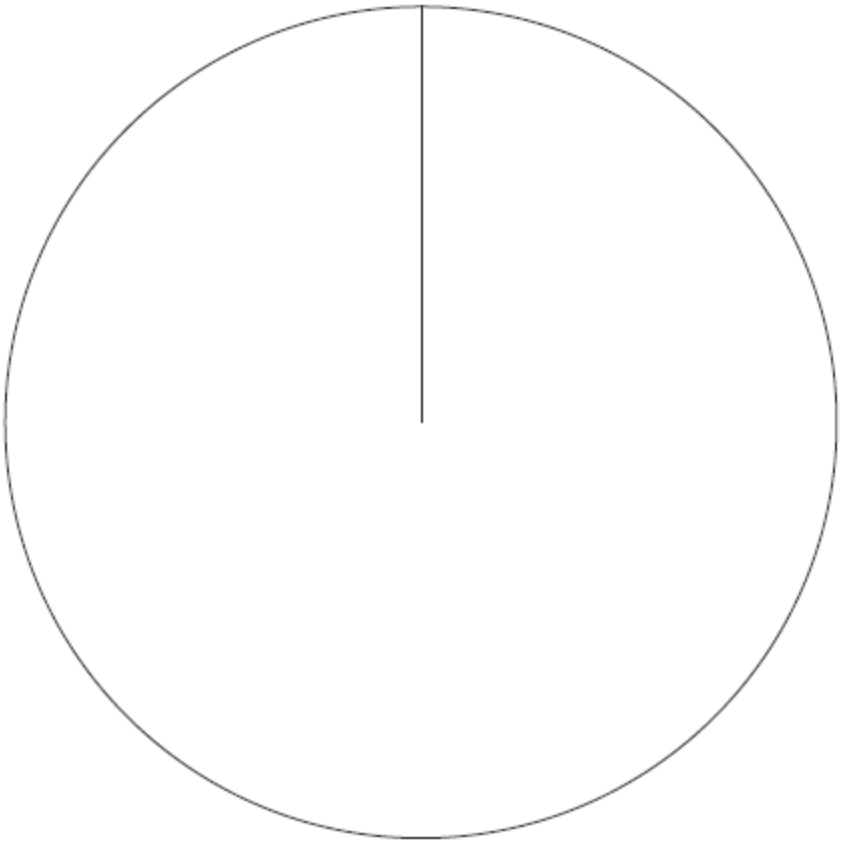
Advice

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.

1. The table gives information about the numbers of fish in a lake.

Fish	**Frequency**	
Perch	10	
Bream	23	
Carp	39	

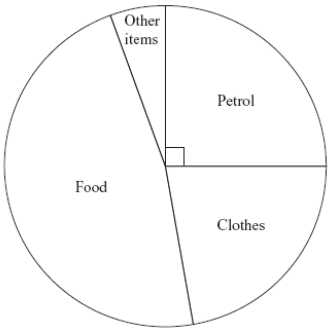
Draw an accurate pie chart to show this information.



(4 marks)

2. Mrs Yusuf went shopping at a superstore.

The pie chart shows information about the money she spent on petrol, on clothes, on food and on other items.



(a) What did she spend most money on?

.....

(1)

(b) What fraction of the money she spent was on petrol?

.....

(1)

Mrs Yusuf spent £25 on petrol at the superstore.

(c) In total, how much money did she spend?

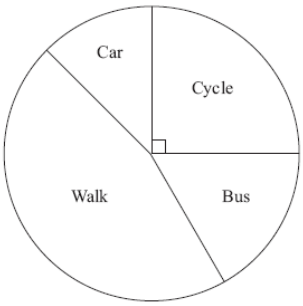
£ .....

(2)

(4 marks)

---

3. Harry asked each student in his class how they travelled to school that day.
He used the results to draw this pie chart.



(a) How did most of the students travel to school?

.....

(1)

Harry asked a total of 24 students.

(b) Work out the number of students who cycled to school.

.....

(2)

(3 marks)

---

4. Sally recorded the musical instrument played by each of 30 students in the school orchestra. The table shows her results.

Musical instrument	Frequency	
Clarinet	5	
Guitar	12	
Flute	7	
Drums	6	

One of the students in the school orchestra is chosen at random.

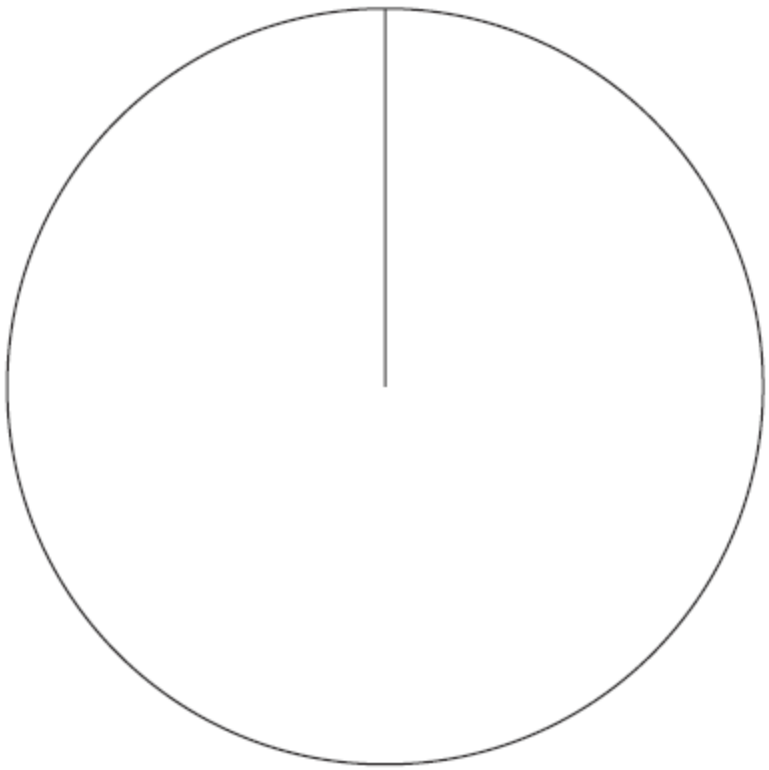
(a) Find the probability that this student plays the flute.

(2)

.....

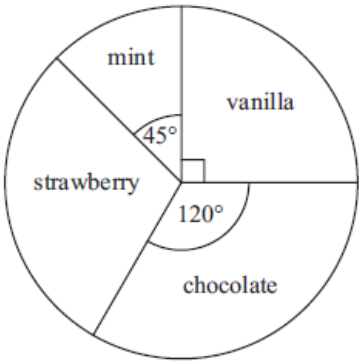
(b) Draw an accurate pie chart to show the information shown in the table.

(4)



(6 marks)

5. Some children were asked to name their favourite flavour of ice cream.
The pie chart and table show some information about their answers.

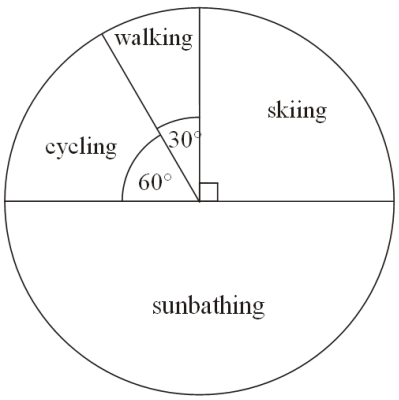


Use the pie chart to complete the table.

Flavour	Number of children	Angle of sector
vanilla	12	90°
mint	.....	45°
strawberry	14	.....
chocolate	.....	120°

(3 marks)

6. Noreen carries out a survey of some students.
The pie chart shows some information about their favourite holiday.



5 students said that walking is their favourite holiday.

(a) How many students took part in the survey?

.....
(2)

Noreen chooses one of these students at random.

(b) Write down the probability that this student's favourite holiday is cycling. .....
(1)

(3 marks)

7. The pie charts show some information about the numbers of medals won by Germany and by the Russian Federation in the 2010 Winter Olympics.

Medals won by Germany

Medals won by the Russian Federation

Germany won 7 bronze medals.

(a) How many gold medals did Germany win?

.....

(2)

(b) Graham says,

'The pie charts show that Germany won more gold medals than the Russian Federation'.

Is Graham right? .....

You must explain your answer.

.....

.....

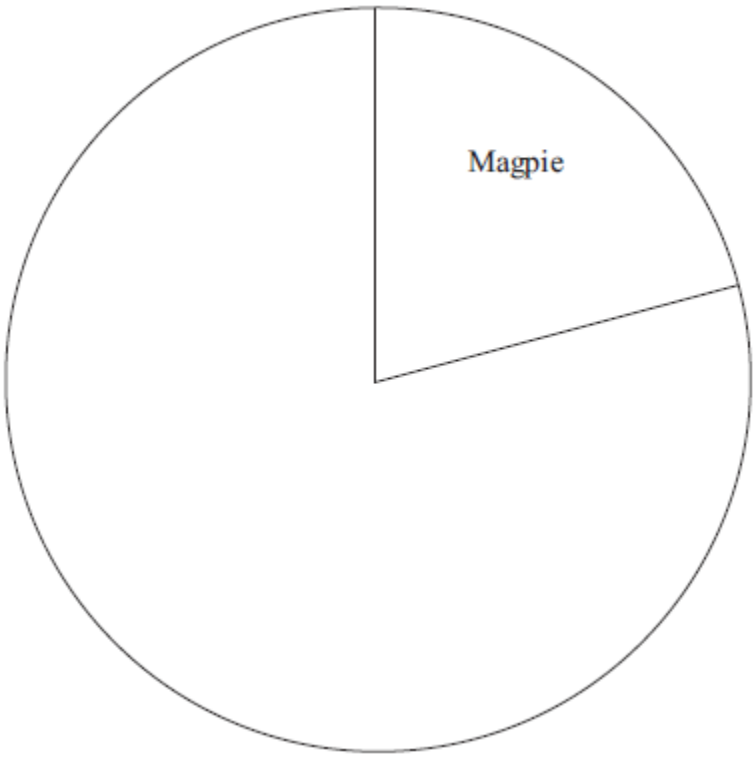
(1)

(3 marks)

8. The table gives some information about the birds Paula sees in her garden one day.

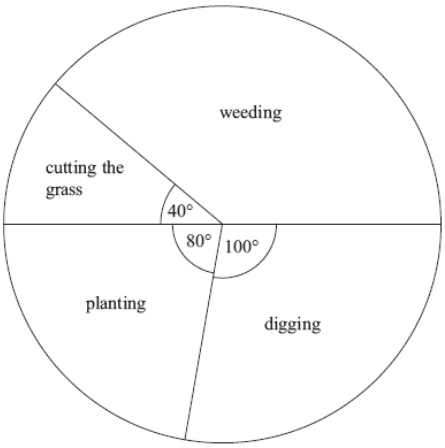
Bird	Frequency
Magpie	15
Thrush	10
Starling	20
Sparrow	27

Complete the accurate pie chart.



(3 marks)

9. The pie chart shows some information about the time Gill spent working in her garden one month.



(a) What fraction of the time did Gill spend cutting the grass?

.....

(1)

Gill spent 7 hours weeding.

(b) How much time did Gill spend planting?

..... hours

(3)

(4 marks)

47 Edexcel GCSE
Mathematics (Linear) – 1MA0

SCATTER GRAPHS

Materials required for examination
Ruler graduated in centimetres and
millimetres, protractor, compasses,
pen, HB pencil, eraser.
Tracing paper may be used.

Instructions

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Calculators may be used.

Information

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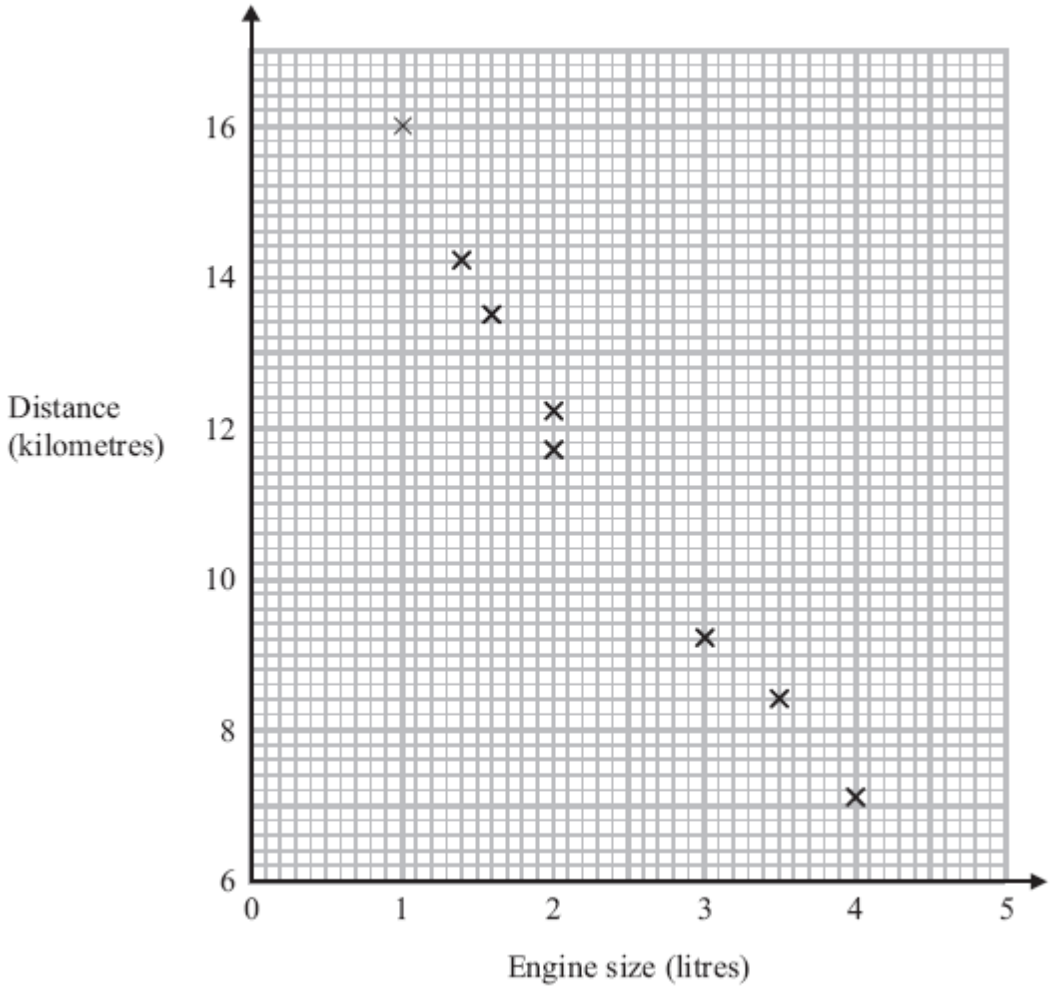
Advice

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.

1. The scatter graph shows some information about 8 cars.
For each car it shows the engine size, in litres, and the distance, in kilometres, the car travels on one litre of petrol.



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

.....

(1)

A different car of the same type has an engine size of 2.5 litres.

(b) Estimate the distance travelled on one litre of petrol by this car.

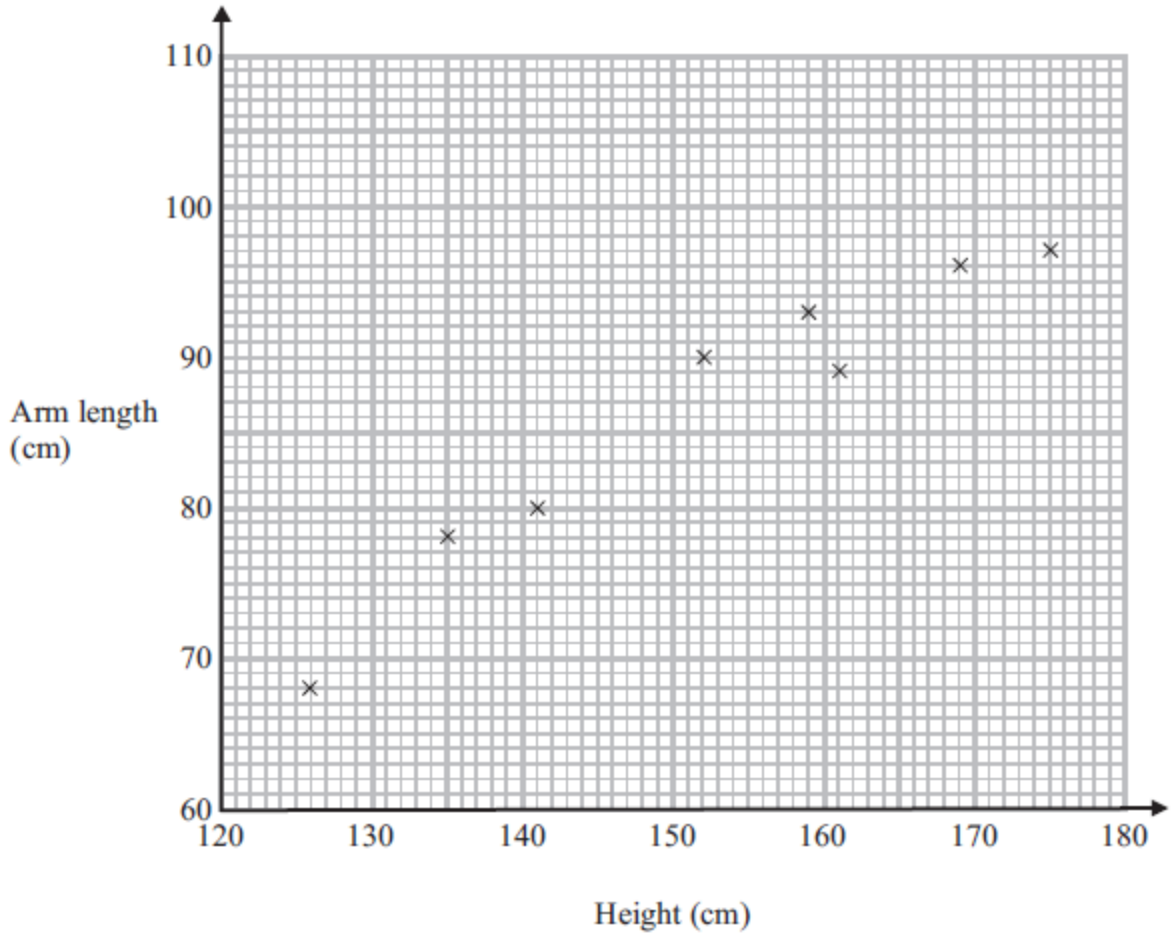
..... kilometres

(2)

(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.

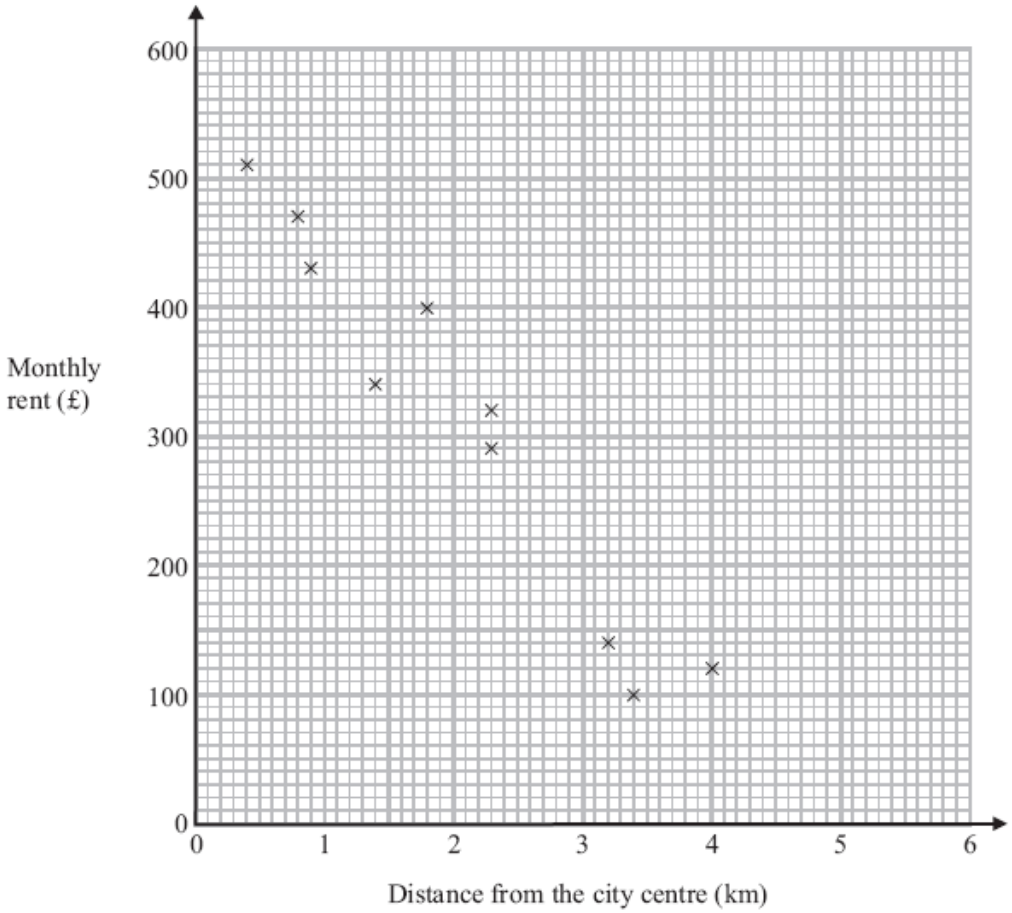
.....cm

(2)

(3 marks)

3. The scatter graph shows information about 10 apartments in a city.

The graph shows the distance from the city centre and the monthly rent of each apartment.



The table shows the distance from the city centre and the monthly rent for two other apartments.

Distance from the city centre (km)	2	3.1
Monthly rent (£)	250	190

(a) On the scatter graph, plot the information from the table.

(1)

(b) Describe the relationship between the distance from the city centre and the monthly rent.

.....

.....

(1)

An apartment is 2.8 km from the city centre.

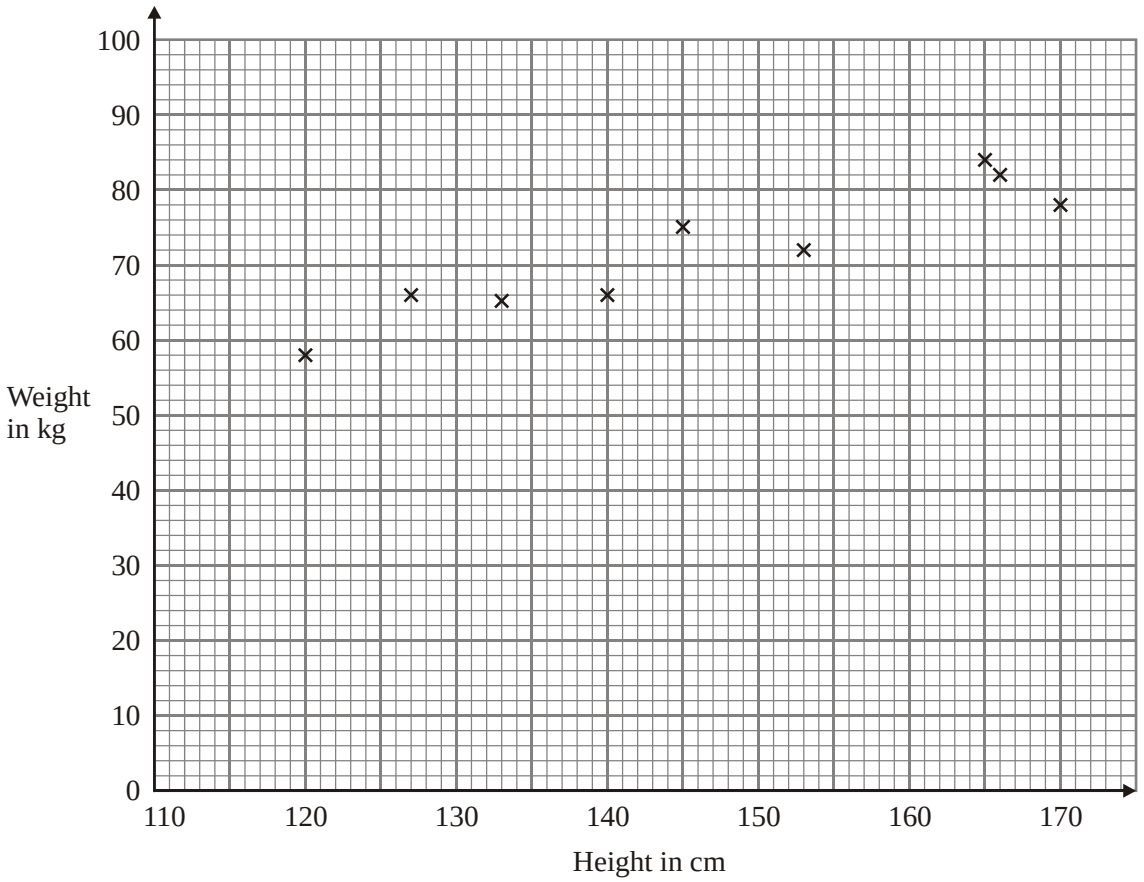
(c) Find an estimate for the monthly rent for this apartment.

£ .....

(2)

(4 marks)

4. The scatter graph shows information about the height and the weight for nine students.



The table shows the height and the weight for three more students.

Height in cm	135	155	170
Weight in kg	70	75	85

(a) On the scatter graph, plot the information from the table.

(1)

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

.....

(1)

(c) The weight of another student is 80 kg.

Estimate the height of this student.

.....cm

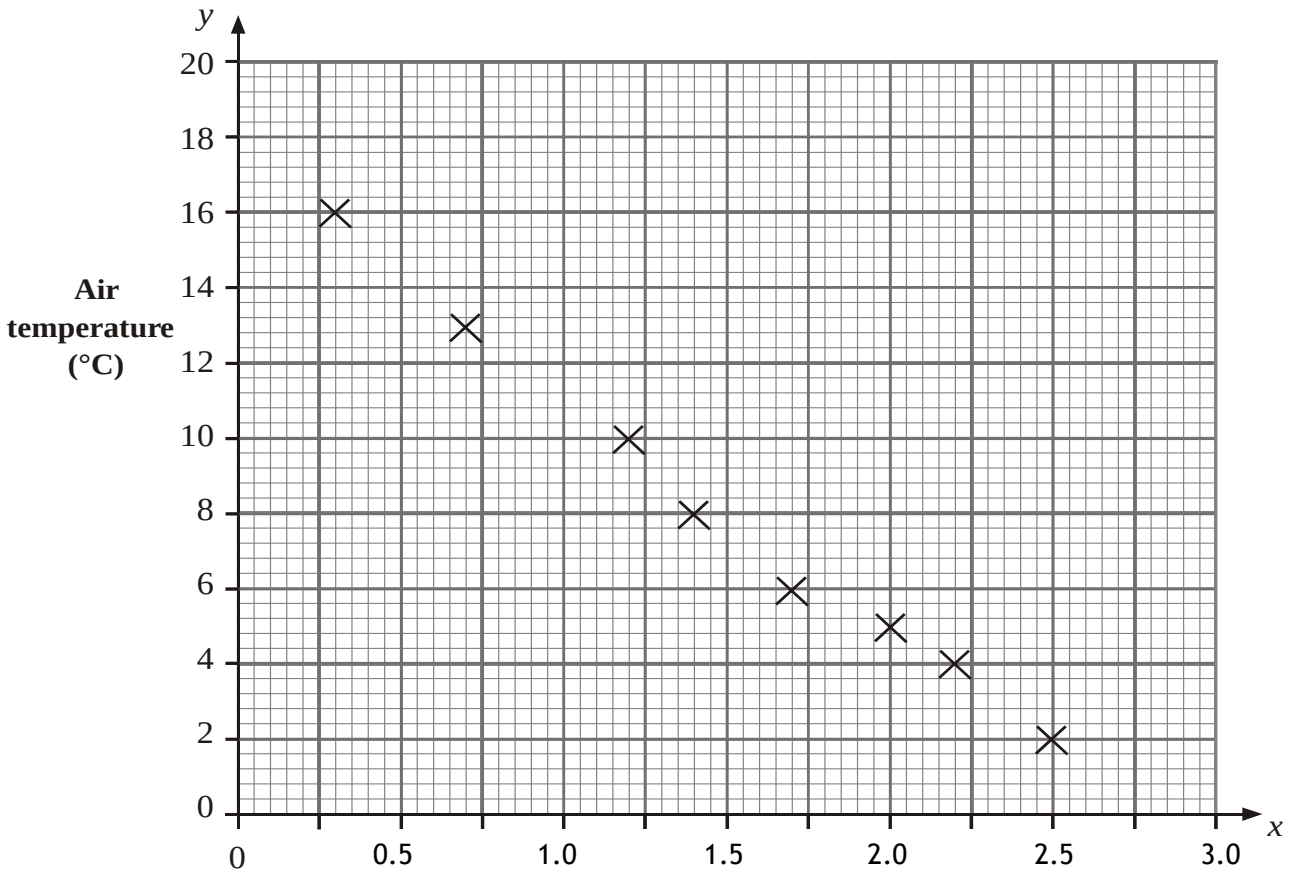
(2)

(4 marks)

---

5. On a particular day, a scientist recorded the air temperature at 8 different heights above sea level. The scatter diagram shows the air temperature, y °C, at each of these heights, x km, above sea level.

Air temperature at different heights above sea level



(a) Using the scatter diagram, write down the air temperature recorded at a height of 2.5 km above sea level.

..... °C
(1)

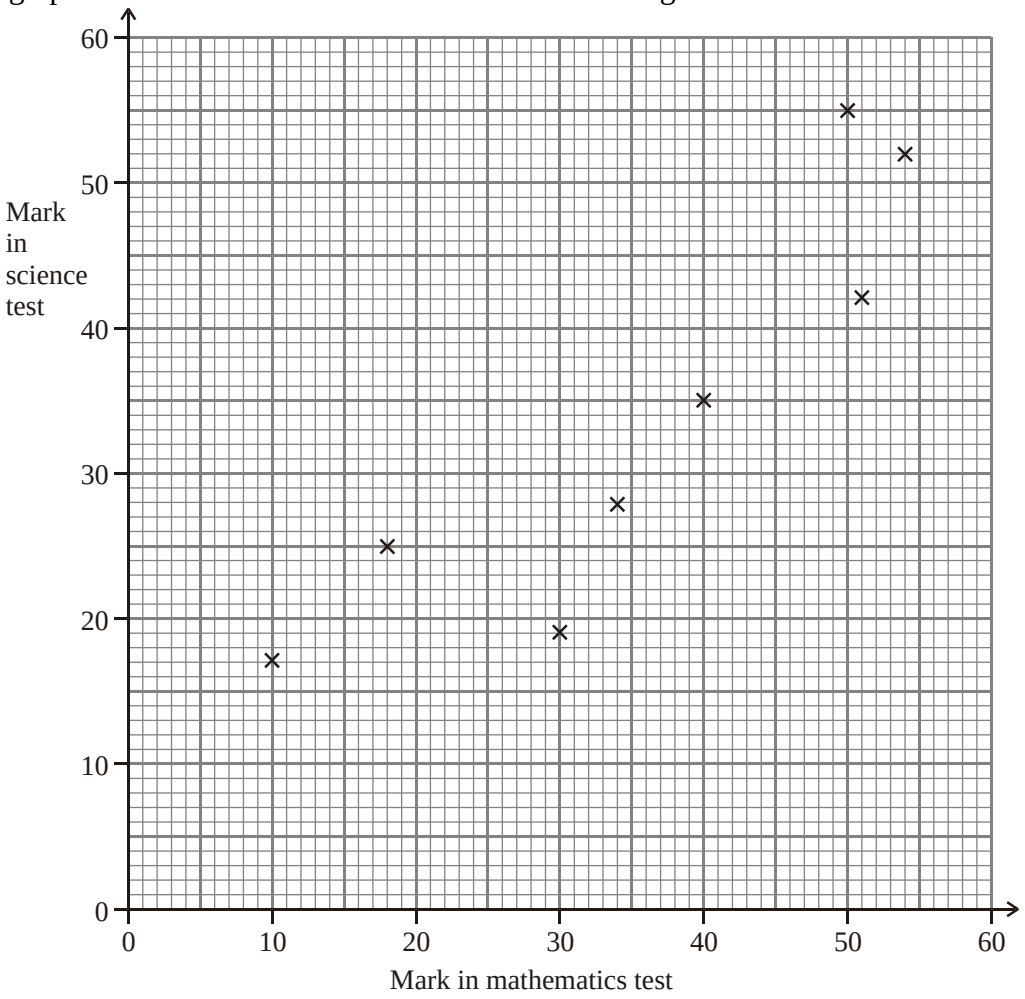
(b) Describe the correlation between the air temperature and the height above sea level.

.....
(1)

(c) Find an estimate of the height above sea level when the air temperature is 0 °C.

..... km
(2)
(4 marks)

6. Some students took a mathematics test and a science test.
The scatter graph shows information about the test marks of eight students.



The table shows the test marks of four more students.

Mark in mathematics test	14	25	50	58
Mark in science test	21	23	38	51

(a) On the scatter graph, plot the information from the table.

(2)

(b) Describe the correlation between the marks in the mathematics test and the marks in the science test.

……..

(1)

Josef was absent for the mathematics test but his mark in the science test was 45

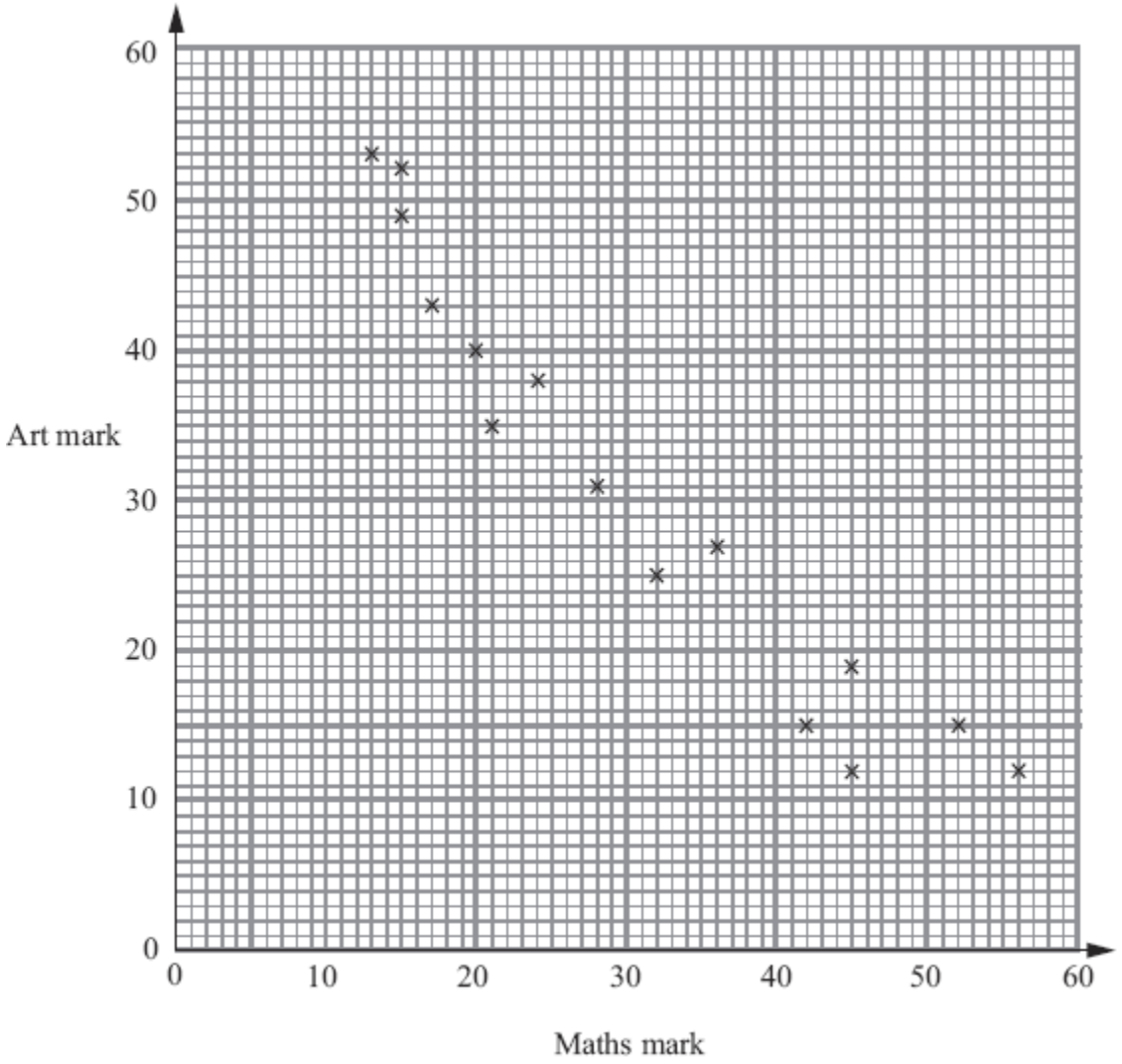
(c) Estimate Josef's mark in the mathematics test.

……..

(2)

(5 marks)

7. The scatter graph shows the maths mark and the art mark for each of 15 students.



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

(1)

.....

(b) Draw a line of best fit on the scatter graph.

(1)

Sarah has not got a maths mark.
Her art mark is 23

(c) Use your line of best fit to estimate a maths mark for Sarah.

(1)

.....

(3 marks)

48 Edexcel GCSE
Mathematics (Linear) – 1MA0

FREQUENCY POLYGONS

Materials required for examination
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.
Tracing paper may be used.

Items included with question papers
Nil

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Advice

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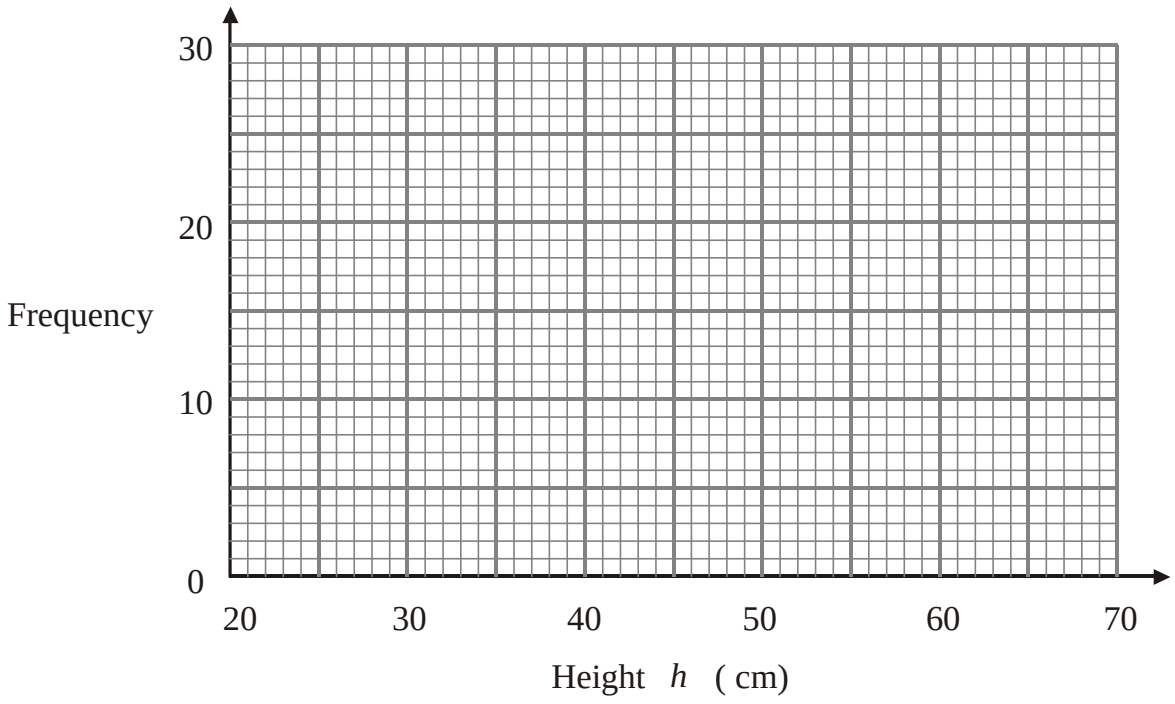
Keep an eye on the time.
Try to answer every question.
Check your answers if you have time at the end.

1. The table shows some information about the heights (h *cm*) of 60 plants.

Height (h cm)	**Frequency**
$20 < w \leq 30$	8
$30 < w \leq 40$	13
$40 < w \leq 50$	25
$50 < w \leq 60$	10
$60 < w \leq 70$	4

Draw a frequency polygon to show this information.

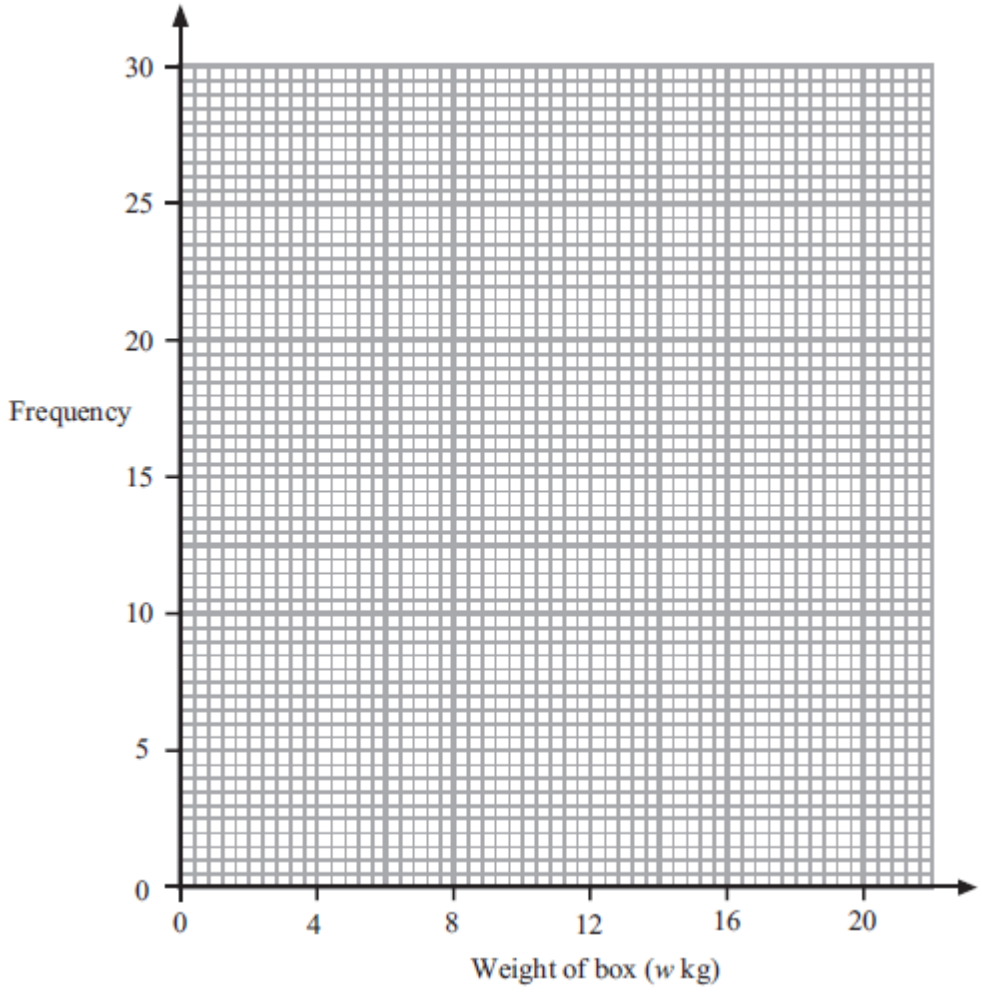


(4 marks)

2. The table shows some information about the weights, in kg, of 100 boxes.

Weight of box (w kg)	**Frequency**
$0 < w \leq 4$	10
$4 < w \leq 8$	17
$8 < w \leq 12$	28
$12 < w \leq 16$	25
$16 < w \leq 20$	20

Draw a frequency polygon to show this information.



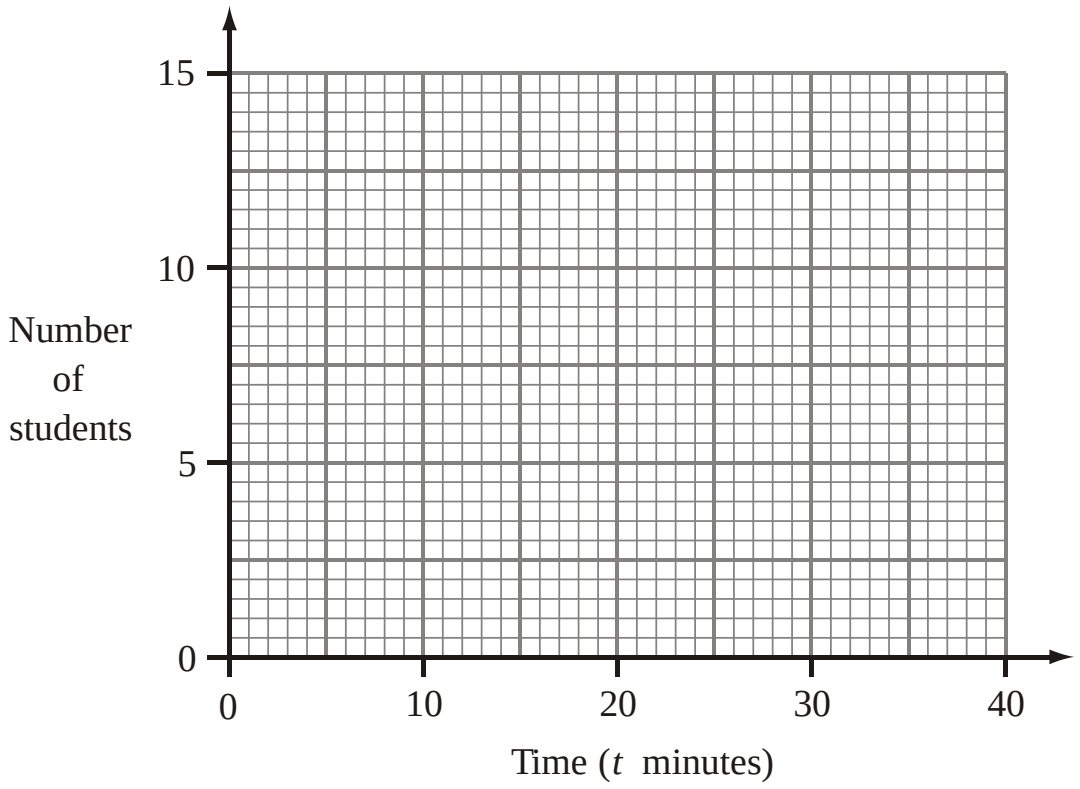
(4 marks)

3. 30 students ran a cross-country race.
Each student's time was recorded.

The table shows information about these times.

Time (t minutes)	Frequency
$10 \leq t < 14$	2
$14 \leq t < 18$	5
$18 \leq t < 22$	12
$22 \leq t < 26$	8
$26 \leq t < 30$	3

On the grid, draw a frequency polygon to show this information.

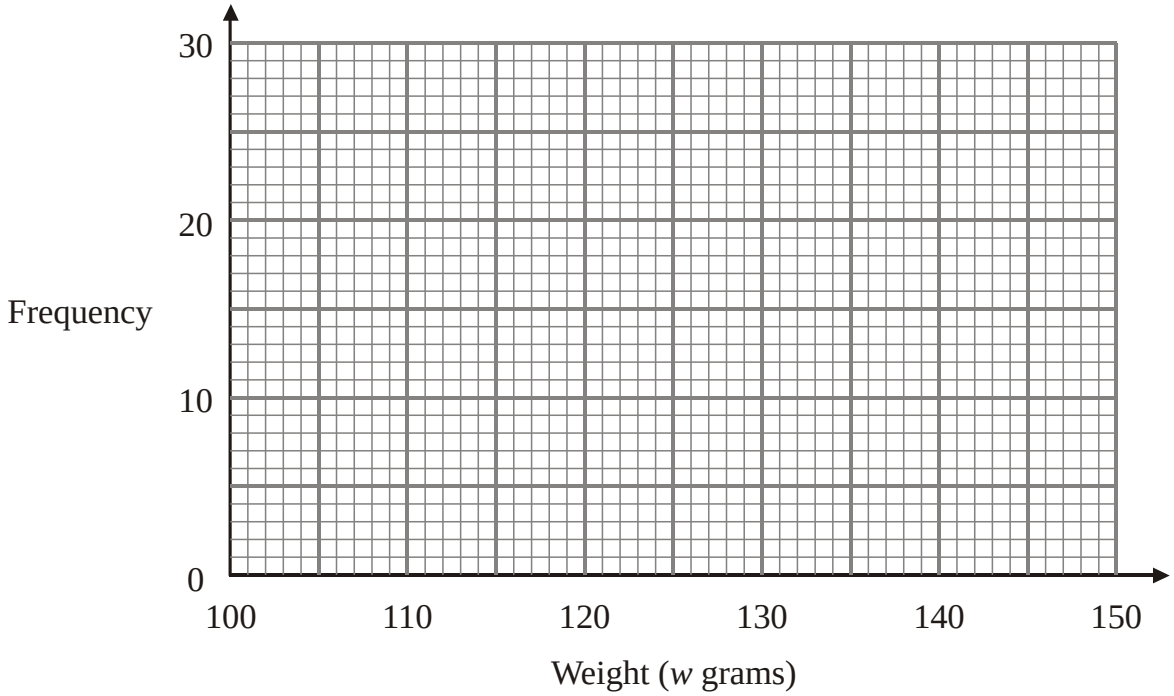


(4 marks)

4. The table shows some information about the weights (w grams) of 60 apples.

Weight (w grams)	**Frequency**
$100 \leq w < 110$	5
$110 \leq w < 120$	9
$120 \leq w < 130$	14
$130 \leq w < 140$	24
$140 \leq w < 150$	8

Draw a frequency polygon to show this information.

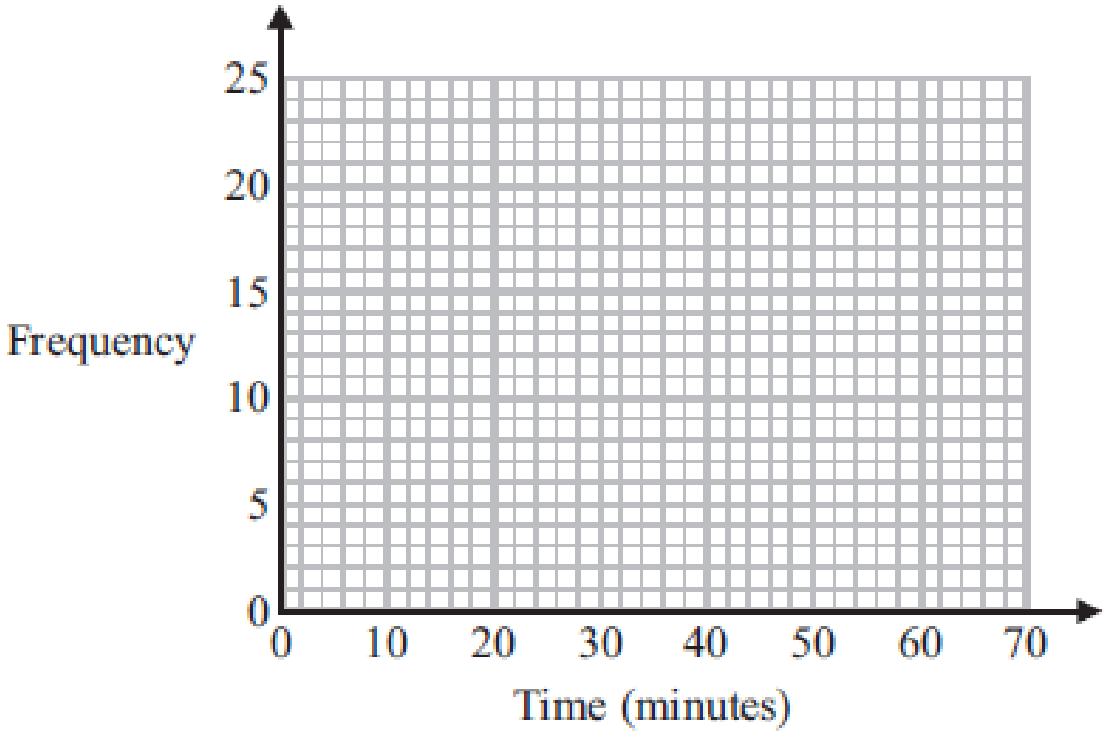


(4 marks)

5. The frequency table gives information about the times it took some office workers to get to the office one day.

Time (t minutes)	Frequency
$0 < t \leq 10$	4
$10 < t \leq 20$	8
$20 < t \leq 30$	14
$30 < t \leq 40$	16
$40 < t \leq 50$	6
$50 < t \leq 60$	2

(a) Draw a frequency polygon for this information.



(3)

(b) Write down the modal class interval.

.....

(1)

One of the office workers is chosen at random.

(c) Work out the probability that this office worker took more than 40 minutes to get to the office.

.....

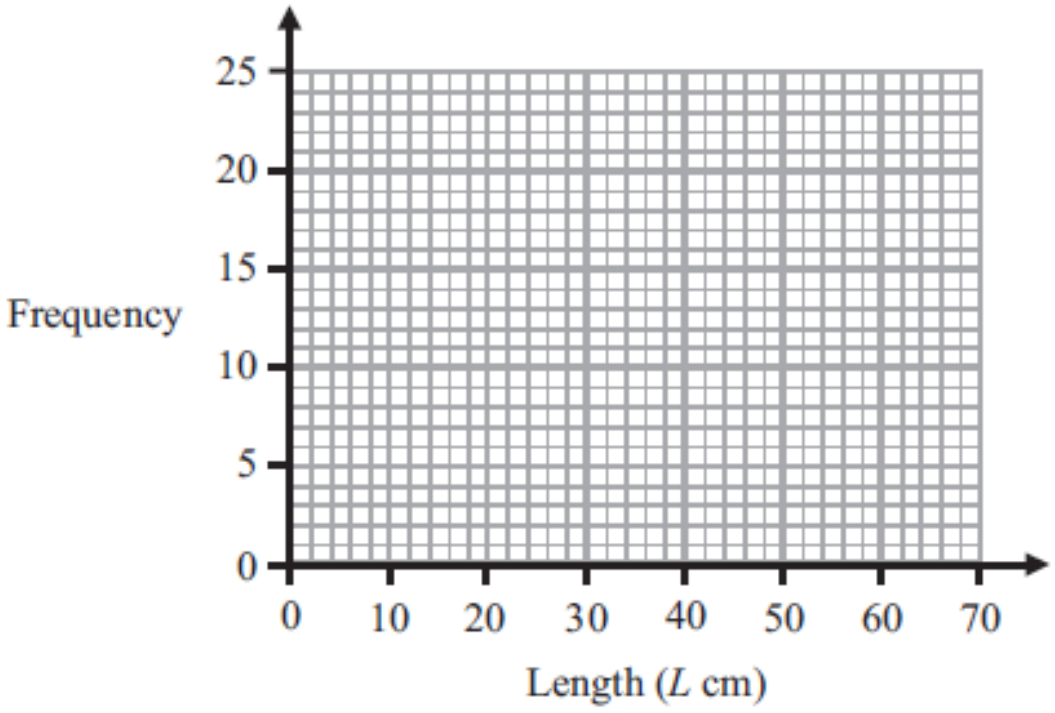
(2)

(6 marks)

6. The table gives information about the lengths of the branches on a bush.

Length(Lcm)	**Frequency**
$0 \le L < 10$	20
$10 \le L < 20$	12
$20 \le L < 30$	10
$30 \le L < 40$	8
$40 \le L < 50$	6
$50 \le L < 60$	0

(a) Draw a frequency polygon to show this information.



(3)

(b) Write down the modal class interval.

.....

(1)

One of the branches is chosen at random.

(c) Work out the probability that this branch less than 20 cm long.

.....

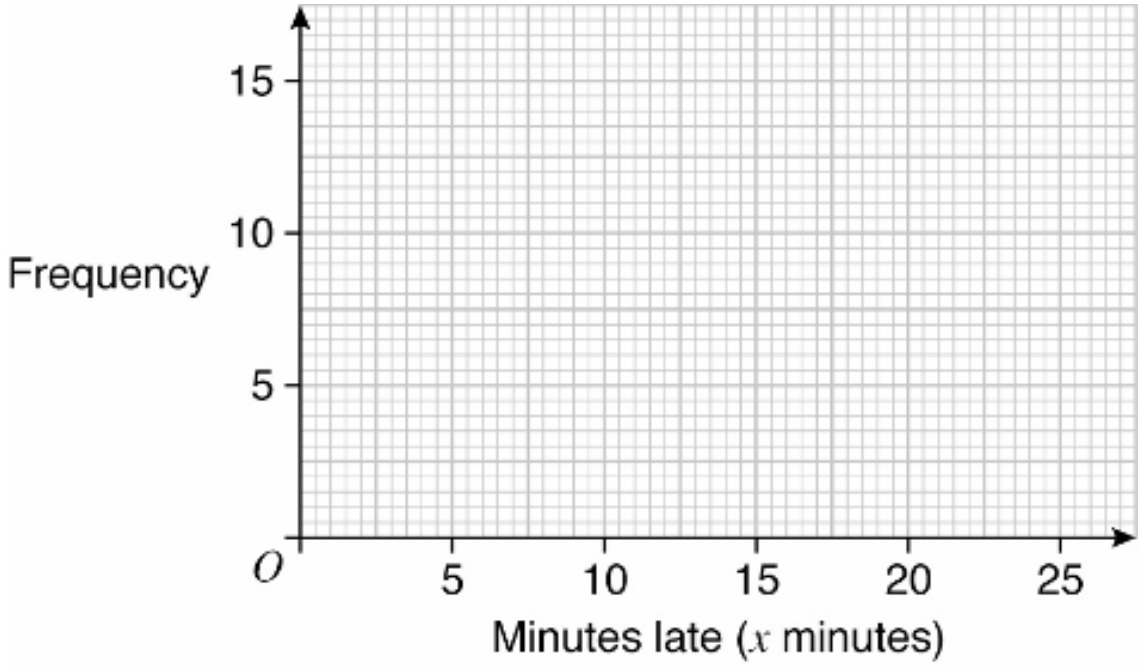
(2)

(6 marks)

7. In one month, Janet travelled by bus 25 times and by train 25 times.
The grouped frequency table records the number of minutes (x minutes) late each of her buses and trains were.

Minutes late	Bus	Train
$0 \leq x < 5$	5	9
$5 \leq x < 10$	15	6
$10 \leq x < 15$	4	6
$15 \leq x < 20$	1	2
$20 \leq x < 25$	0	3

(a) On the grid below draw two frequency polygons to illustrate this data.



(3)

(b) Use your polygons to compare the lateness of buses and trains and comment on any differences you observe.

……

……

……

(2)
(5 marks)

49 Edexcel GCSE
Mathematics (Linear) – 1MA0

STEM & LEAF DIAGRAMS

Materials required for examination
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.
Tracing paper may be used.

Items included with question papers
Nil

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 may be used.

Information

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 – you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.

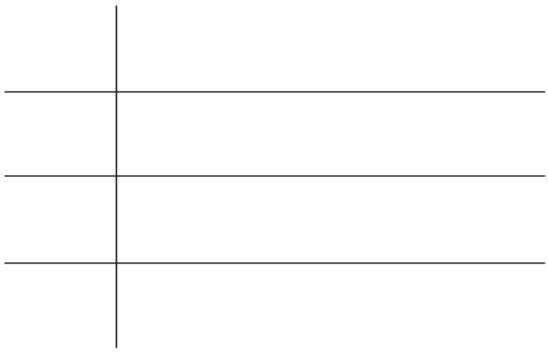
Advice

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.

1. 3. Here are the ages, in years, of 15 students.

19	18	20	25	37
33	21	17	29	20
42	18	23	37	22

Show this information in an ordered stem and leaf diagram.



Key:

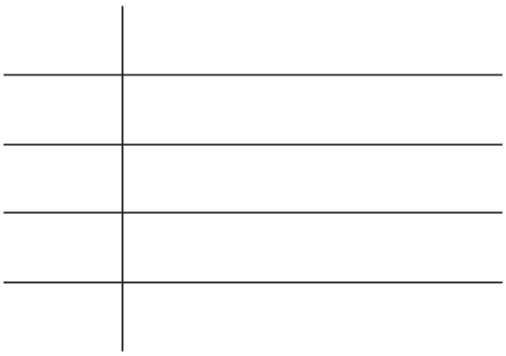
(3 marks)

---

2. Jo measured the times in seconds it took 18 students to run 400 m.
Here are the times.

67	78	79	98	96	103
75	85	94	92	61	80
82	86	90	95	90	89

(a) Draw an ordered stem and leaf diagram to show this information.



Key:

(3)

(b) Work out the median.

..... seconds

(2)

(5 marks)

3. Here are the speeds, in miles per hour, of 16 cars.

31	52	43	49	36	35	33	29
54	43	44	46	42	39	55	48

Draw an ordered stem and leaf diagram for these speeds.

(4 marks)

---

4. Here are some people's ages in years.

62	27	33	44	47
30	22	63	67	54
69	56	63	50	25
31	63	42	48	51

In the space below, draw an ordered stem and leaf diagram to show these ages.

(4 marks)

5. Jim did a survey on the lengths of caterpillars he found on a field trip.
Information about the lengths is given in the stem and leaf diagram.

1	3 5 7 7
2	0 6 8 8 8 9
3	1 5 5 5 5 6 8 9
4	1 5
5	2

Key: 5|2 means 5.2 cm

Work out the median.

..... cm

(2 marks)

---

6. Here are the times, in minutes, taken to solve a puzzle.

5 10 15 12 8 7 20 35 24 15

20 33 15 24 10 8 10 20 16 10

(a) In the space below, draw a stem and leaf diagram to show these times.

(3)

(b) Find the median time to solve this puzzle.

…… mins

(2)

(5marks)

7. Jan measures the heights, in millimetres, of 20 plants in her greenhouse.
Here are her results.

178	189	147	147	166
167	153	171	164	158
189	166	165	155	152
147	158	148	151	172

Complete the stem and leaf diagram to show this information.

Stem	**Leaf**

(4 marks)

8. Anil counted the number of letters in each of 30 sentences in a newspaper.

Anil showed his results in a stem and leaf diagram.

0	8 8 9
1	1 2 3 4 4 8 9
2	0 3 5 5 7 7 8
3	2 2 3 3 6 6 8 8
4	1 2 3 3 5

Key 4 |1 stands for 41 letters

(a) Write down the number of sentences with 36 letters. .....

(1)

(b) Work out the range. .....

(1)

(c) Work out the median.

.....

(2)

(4 marks)

9. Here are the weights, in kilograms, of 15 parcels.

1.1 1.7 2.0 1.0 1.1 0.5 3.3 2.0

1.5 2.6 3.5 2.1 0.7 1.2 0.6

Draw a stem and leaf diagram to show this information.

(Total 3 marks)

10. Janine recorded the times, in seconds, for each of 15 people to do a puzzle.
Here are her results.

90 81 78 83 68

75 79 81 69 87

76 91 67 73 81

(a) Complete the ordered stem and leaf diagram and key to show these results.

6	
7	
8	
9	

Key

(3)

Janine says "To find the median time, you add all the results and divide by 15"

Janine is **wrong**.

(b) (i) Explain how to find the median.

.....

.....

.....

.....

.....

(ii) Find the median.

..... s

(2)

(Total 5 marks)

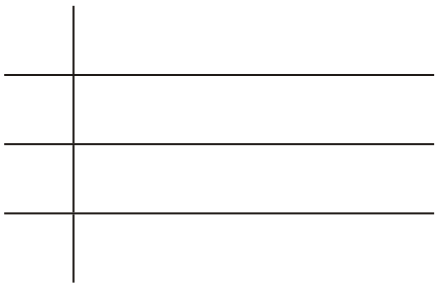
11. Here are the ages, in years, of 15 teachers.

35 52 42 27 36

23 31 41 50 34

44 28 45 45 53

(a) Draw an ordered stem and leaf diagram to show this information.
You must include a key.



Key:

(3)

One of these teachers is picked at random.

(b) Work out the probability that this teacher is more than 40 years old.

.....

(2)

(Total 5 marks)

50 Edexcel GCSE
Mathematics (Linear) – 1MA0

PROBABILITY

Materials required for examination
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.
Tracing paper may be used.

Items included with question papers
Nil

Instructions

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Fill in the boxes at the top of this page with your name, centre number and candidate number.
Answer all questions.
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Calculators may be used.

Information

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Advice

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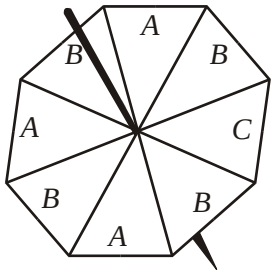
Keep an eye on the time.
Try to answer every question.
Check your answers if you have time at the end.

1.



The diagram shows a fair spinner in the shape of a rectangular octagon.
The spinner can land on A or B or C.
Marc spins the spinner.

Write down the probability that the spinner will land on A.

.....

(Total 2 marks)

2. Ishah spins a fair 5-sided spinner.
She then throws a fair coin.

(a) List all the possible outcomes she could get.
The first one has been done for you.

(1, head).....

.....

.....

(2)

Ishah spins the spinner once and throws the coin once.

(b) Work out the probability that she will get a 1 and a head.

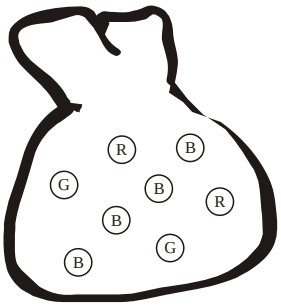
.....

(1)

(Total 3 marks)

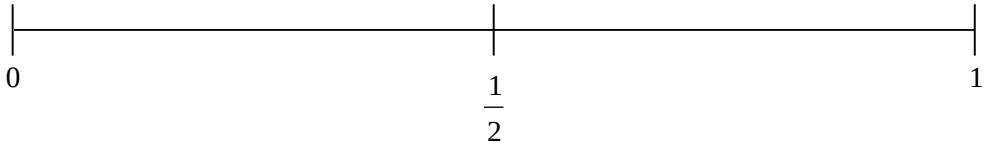
3. There are eight marbles in a bag.

Four marbles are blue (B),
two marbles are red (R)
and two marbles are green (G).



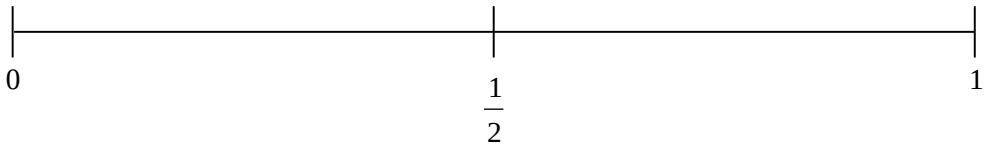
Steve takes a marble at random from the bag.

(a) On the probability scale, mark with the letter B, the probability that Steve will take a blue marble.



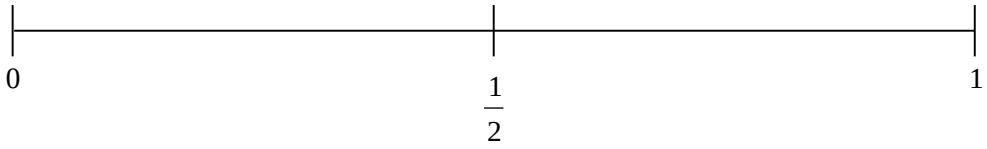
(1)

(b) On the probability scale, mark with the letter G, the probability that Steve will take a green marble.



(1)

(c) On the probability scale, mark with the letter Y, the probability that Steve will take a yellow marble.



(1)
(Total 3 marks)

4. Lucy uses some letter cards to spell the word "NOVEMBER".

N	O	V	E	M	B	E	R

Lucy takes one of these cards at random.

Write down the probability that Lucy takes a card with a letter E.

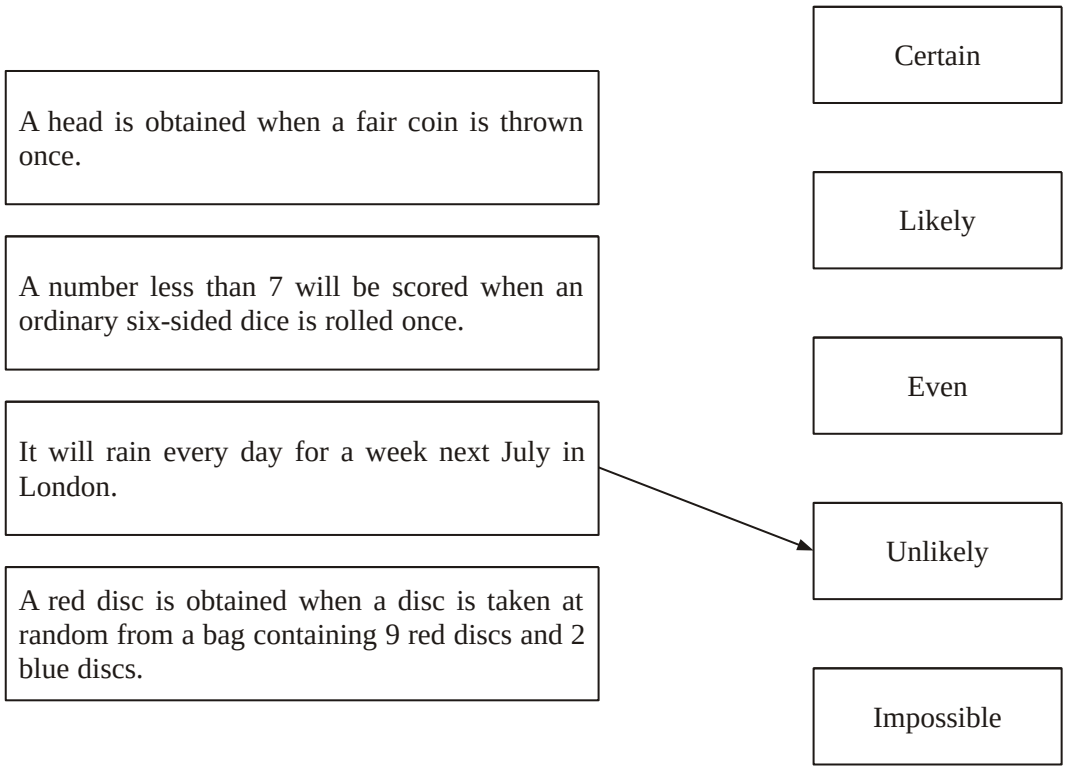
.....

(Total 2 marks)

5. Here are some statements.

Draw an arrow from each statement to the word which best describes its likelihood.

One has been done for you.



(Total 3 marks)

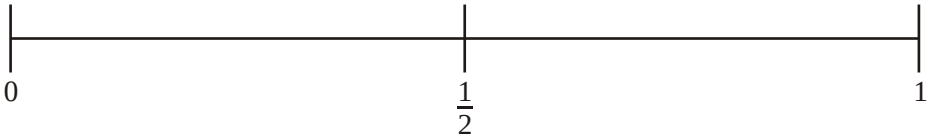
6. There are three beads in a bag.
One bead is red, one bead is white and one bead is yellow.

Sarah takes, at random, a bead from the bag.
She looks at its colour and then puts the bead back in the bag.

On the probability line,

(i) mark with the letter R the probability that Sarah takes a red bead.

(ii) mark with the letter B the probability that Sarah takes a black bead.



(2)
(Total 2 marks)

7. A bag contains some beads which are red or green or blue or yellow.

The table shows the number of beads of each colour.

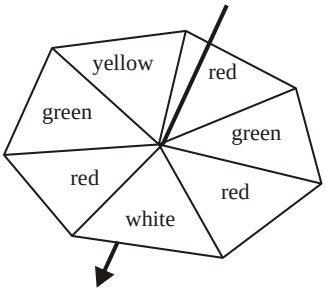
Colour	Red	Green	Blue	Yellow
Number of beads	3	2	5	2

Samire takes a bead at random from the bag.
Write down the probability that she takes a blue bead.

.....

(Total 2 marks)

8.



Here is a fair 7-sided spinner.
The spinner is to be spun once.
The spinner will land on one of the colours.

(a) On which colour is the spinner most likely to land?

.....

(1)

(b) Write down the probability that the spinner will land on green.

.....

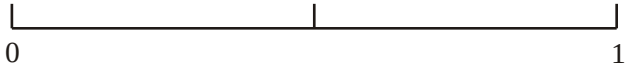
(1)
(Total 2 marks)

9. On the probability scale below, mark

(i) with the letter S, the probability that it will snow in London in June,

(ii) with the letter H, the probability that when a fair coin is thrown once it comes down heads,

(iii) with the letter M, the probability that it will rain in Manchester next year.



(Total 3 marks)

10. Joshua rolls an ordinary dice once.
It has faces marked 1, 2, 3, 4, 5 and 6.

(a) Write down the probability that he gets

(i) a 6,

……

(ii) an odd number,

……

(iii) a number less than 3,

……

(iv) an 8.

……

(4)

Ken rolls a different dice 60 times. This dice also has six faces.

The table gives information about Ken's scores.

Score on dice	Frequency
1	9
2	11
3	20
4	2
5	8
6	10

(b) Explain what you think is different about Ken's dice.

.....

.....

(1)
(Total 5 marks)

11. Emily has a bag of 20 fruit flavour sweets.

7 of the sweets are strawberry flavour,
11 are lime flavour,
2 are lemon flavour.

Emily takes at random a sweet from the bag.

Write down the probability that Emily

(a) takes a strawberry flavour sweet,

.....(1)

(b) does **not** take a lime flavour sweet,

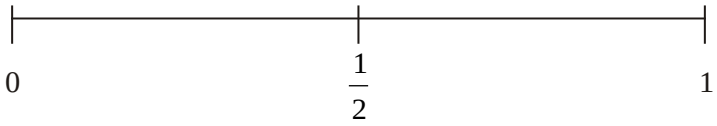
.....(1)

(c) takes an orange flavour sweet.

.....(1)

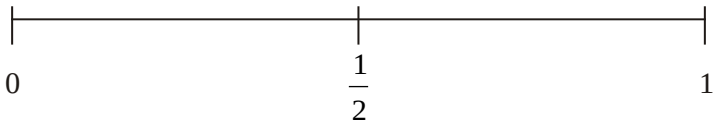
(Total 3 marks)

12. (a) On the probability scale below, mark with a cross (×)
the probability that it will rain on at least one day in London in 2008.



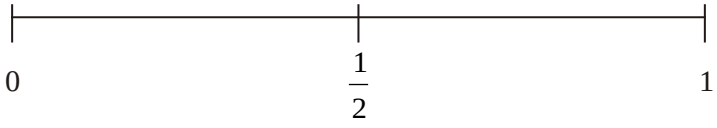
(1)

(b) On the probability scale below, mark with a cross (×)
the probability that you will get a 10 when you roll an ordinary 6-sided dice.



(1)

(c) On the probability scale below, mark with a cross (×)
the probability that you will get a head when you throw a coin.



(1)
(Total 3 marks)