Please check the examination details below before entering your candidate information

Candidate surname	Other names

Pearson Edexcel International GCSE

Centre Number | Candidate Number

Thursday 6 June 2019 PREDICTION PAPER 2F

Morning (Time: 2 hours)	Paper Reference **4MA1/2H**

Mathematics A

Level 1/2
Unit 2H

You must have:
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser, calculator. 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.
- Without sufficient working, correct answers may be awarded no marks.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- **Calculators may be used.**
- You must **NOT** write anything on the formulae page.
  Anything you write on the formulae page will gain NO credit.

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.*

Advice

- Read each question carefully before you start to answer it.
- Check your answers if you have time at the end.

Turn over ▶

P59019A

1/1/1/

P 5 9 0 1 9 A 0 1 2 4

Pearson

Grade 4/5

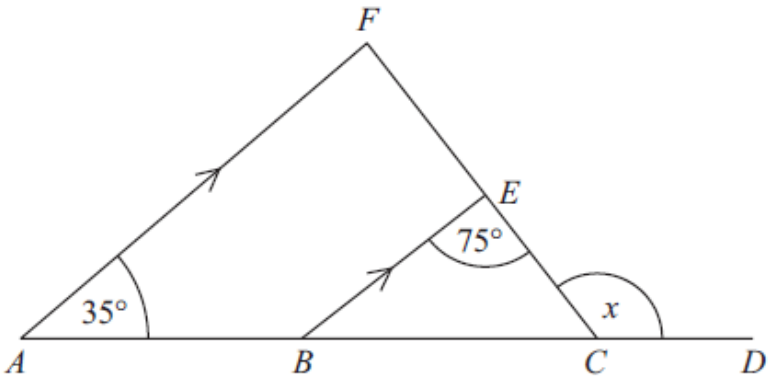


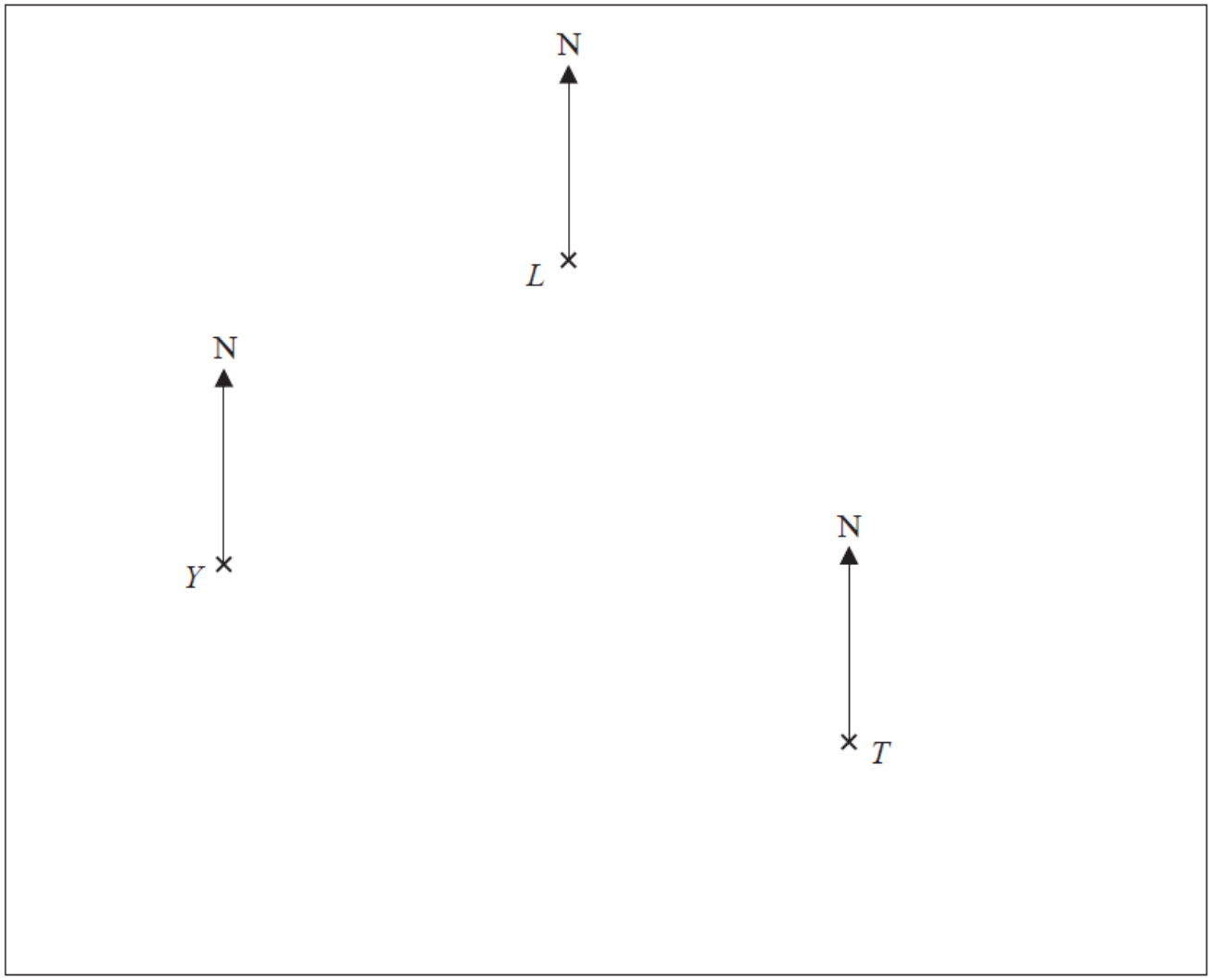
Diagram **NOT** accurately drawn

ABCD is a straight line.
AF is parallel to *BE*.
Angle *FAB* = 35°
Angle *CEB* = 75°

Work out the size of the angle marked *x*.
Give reasons for your answer.

(Total for Question 13 is 4 marks)

The diagram shows the positions of a lighthouse L, a yacht Y and a tanker T on a map.



Scale 1 cm represents 10 km

(a) Measure the bearing of L from Y.

..... °

(1)

The tanker, T, sails 80 km on a bearing of 320°.

(b) Find the distance, in km, between the tanker and the lighthouse when the tanker is closest to the lighthouse.

..... km

(2)

(Total for Question 12 is 3 marks)

The diagram shows the positions of three turbines A, B and C.

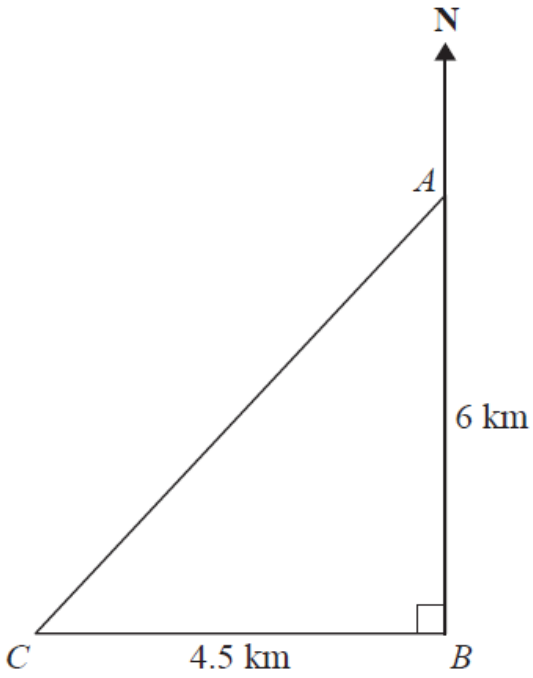


Diagram **NOT** accurately drawn

A is 6 km due north of turbine B.
C is 4.5 km due west of turbine B.

(a) Calculate the distance AC.

..... km

(3)

(b) Calculate the bearing of C from A.
Give your answer correct to the nearest degree.

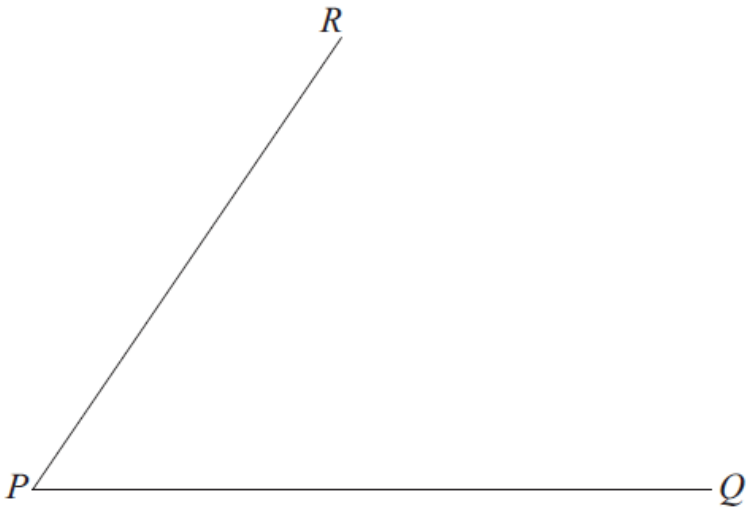
.....°

(4)

(a) Use ruler and compasses to construct the perpendicular bisector of the line AB.
You must show all your construction lines.

(2)

(b) Use ruler and compasses to construct the bisector of angle RPQ.
You must show all your construction lines.



(2)

***14** Viv wants to invest £2000 for 2 years in the same bank.

The International Bank	**The Friendly Bank**
Compound Interest	Compound Interest
4% for the first year 1% for each extra year	5% for the first year 0.5% for each extra year

At the end of 2 years, Viv wants to have as much money as possible.

Which bank should she invest her £2000 in?

(Total for Question 14 is 4 marks)

1 Mike buys c pens and r rulers.

Each pen costs 24 cents.
Each ruler costs 37 cents.

Mike spends a total of T cents buying pens and rulers.

Write down a formula for T in terms of c and r.

.....

(Total for Question 1 is 3 marks)

6 Jalin lives in England.
He does a search on the internet and sees the same type of camera on sale in France and in America.

In France, the camera costs 126 euros.
In America, the camera costs $165.24

Jalin finds out these exchange rates.

Exchange rates
1 euro = £0.89
£1 = $1.62

How much cheaper is the camera in America than in France?
Give your answer in pounds (£).

£ .....

(Total for Question 6 is 4 marks)

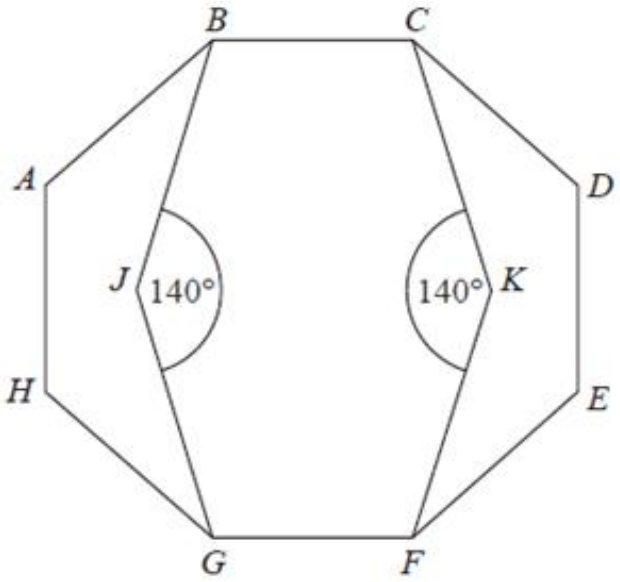


Diagram **NOT** accurately drawn

ABCDEFGH is a regular octagon.
BCKFGJ is a hexagon.

JK is a line of symmetry of the hexagon.
Angle *BJG* = angle *CKF* = 140°

Work out the size of angle *KFE*.
You must show all your working.

.....°

(Total for Question 17 is 4 marks)

$-2 \leqslant n < 2$

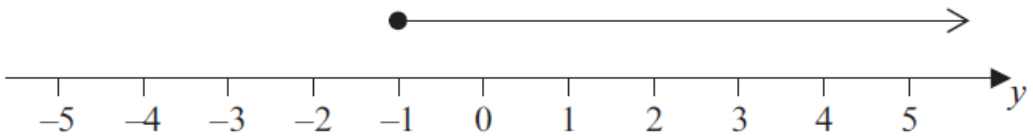
n is an integer.

(a) Write down all the possible values of n.

.....

(2)

(b) Here is an inequality, in y, shown on a number line.

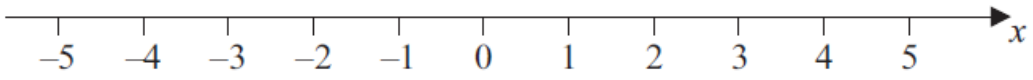


Write down the inequality.

.....

(2)

(c) On the number line below, show the inequality $-3 < x < 2$



(2)

(d) Solve $4x + 9 \geqslant 2x + 6$

.....

(3)

5 Here are the ingredients needed to make **8** shortbread biscuits.

Shortbread biscuits makes **8** biscuits
120 g butter 60 g caster sugar 180 g flour

Tariq is going to make some shortbread biscuits.
He has the following ingredients

330 g butter 200 g caster sugar 450 g flour

Work out the greatest number of shortbread biscuits that Tariq can make with his ingredients.
You must show all your working.

..... biscuits

(Total for Question 5 is 3 marks)

The table gives information about he number of boxes of strawberries filled by each of 100 farm workers.

Number of boxes	Frequency
$160 < x \leqslant 180$	5
$180 < x \leqslant 200$	25
$200 < x \leqslant 220$	48
$220 < x \leqslant 240$	22

(a) Write down the modal class interval.

.....

(1)

(b) Work out an estimate for the mean.

.....

(4)

(Total for Question 3 is 5 marks)

10 The table gives information about the time it took each of 80 children to do a jigsaw puzzle.

	Number of children	Mean time (minutes)
Boys	32	32.4
Girls	48	28.4

Work out the mean time for all 80 children.

..... minutes

(Total for Question 10 is 3 marks)

a, b, c and d are 4 integers written in order of size, starting with the smallest integer.

The mean of a, b, c and d is 15
The sum of a, b and c is 39

(a) Find the value of d.

$d =$ .....

(2)

Given also that the range of a, b, c and d is 10

(b) work out the median of a, b, c and d.

.....

(2)

(Total for Question 7 is 4 marks)

Ahmed, Behnaz and Carmen each have some money.

Ahmed has 20% more money than Behnaz.

Carmen has $\frac{7}{8}$ of the amount of money that Behnaz has.

Carmen has 31.50 euros.

Work out how much money Ahmed has.

..... euros

(Total for Question 8 is 3 marks)

In India,

62 million mobile phones were sold from 1st October 2014 to 31st December 2014

14.5% fewer mobile phones were sold from 1st January 2015 to 31st March 2015

(a) Work out the number of mobile phones sold in India from 1st January 2015 to 31st March 2015

..... million

(3)

The table shows information about the mean number of text messages sent by each adult in the UK in 2013 and in 2014

	Mean number of text messages sent by each adult
2013	1656
2014	1404

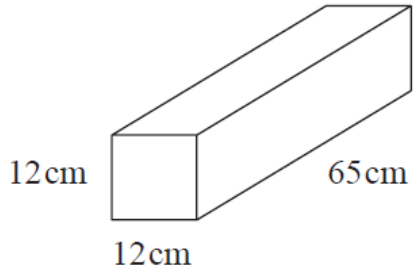
(b) Work out the percentage decrease in the mean number of text messages sent by each adult in the UK from 2013 to 2014

Give your answer correct to 1 decimal place.

..... %

(3)

The diagram shows a concrete block on horizontal ground.



$$p = \frac{F}{A}$$

p = pressure
F = force
A = area

The block is a cuboid, 12 cm by 12 cm by 65 cm.
The block exerts a force of 220 newtons on the ground.

Calculate the pressure that the block exerts on the ground.

Give your answer in newtons / cm^2

..... newtons / cm^2

(Total for Question 6 is 2 marks)

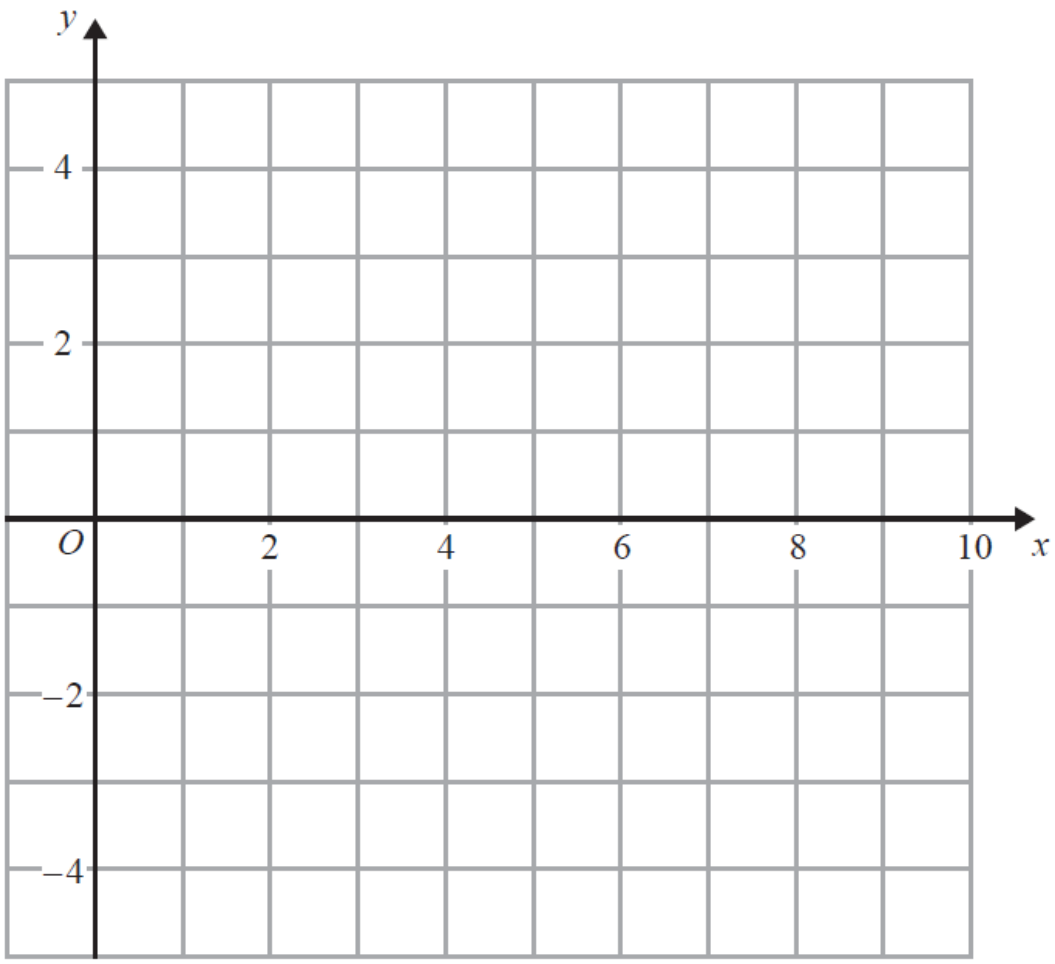
Penny, Amjit and James share some money in the ratios 3 : 6 : 4
Amjit gets $28 more than James.

Work out the amount of money that Penny gets.

$ .....

(Total for Question 2 is 3 marks)

(a) On the grid, draw the line with equation $x + 2y = 8$ for values of x from 0 to 9



(2)

(b) Show, by shading on the grid, the region defined by all three inequalities

$x + 2y \leqslant 8$

$x \geqslant 2$

$y \geqslant 1$

Label your region **R**.

(3)

(Total for Question 8 is 5 marks)

A ship has a length of 345 metres.
A scale model is made of the ship.
The scale of the model is 1 : 200

Work out the length of the scale model of the ship.
Give your answer in centimetres.

..... cm

(Total for Question 13 is 3 marks)

Solve the simultaneous equations

$$3x + 2y = 8$$
$$2x + 5y = -2$$

$x =$ .....

$y =$ .....

(Total 4 marks)

7.

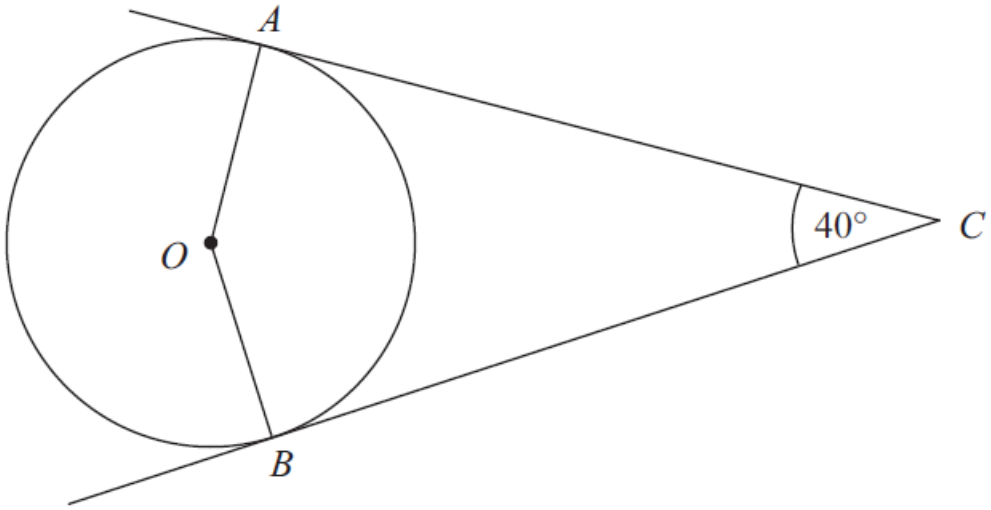


Diagram **NOT** accurately drawn

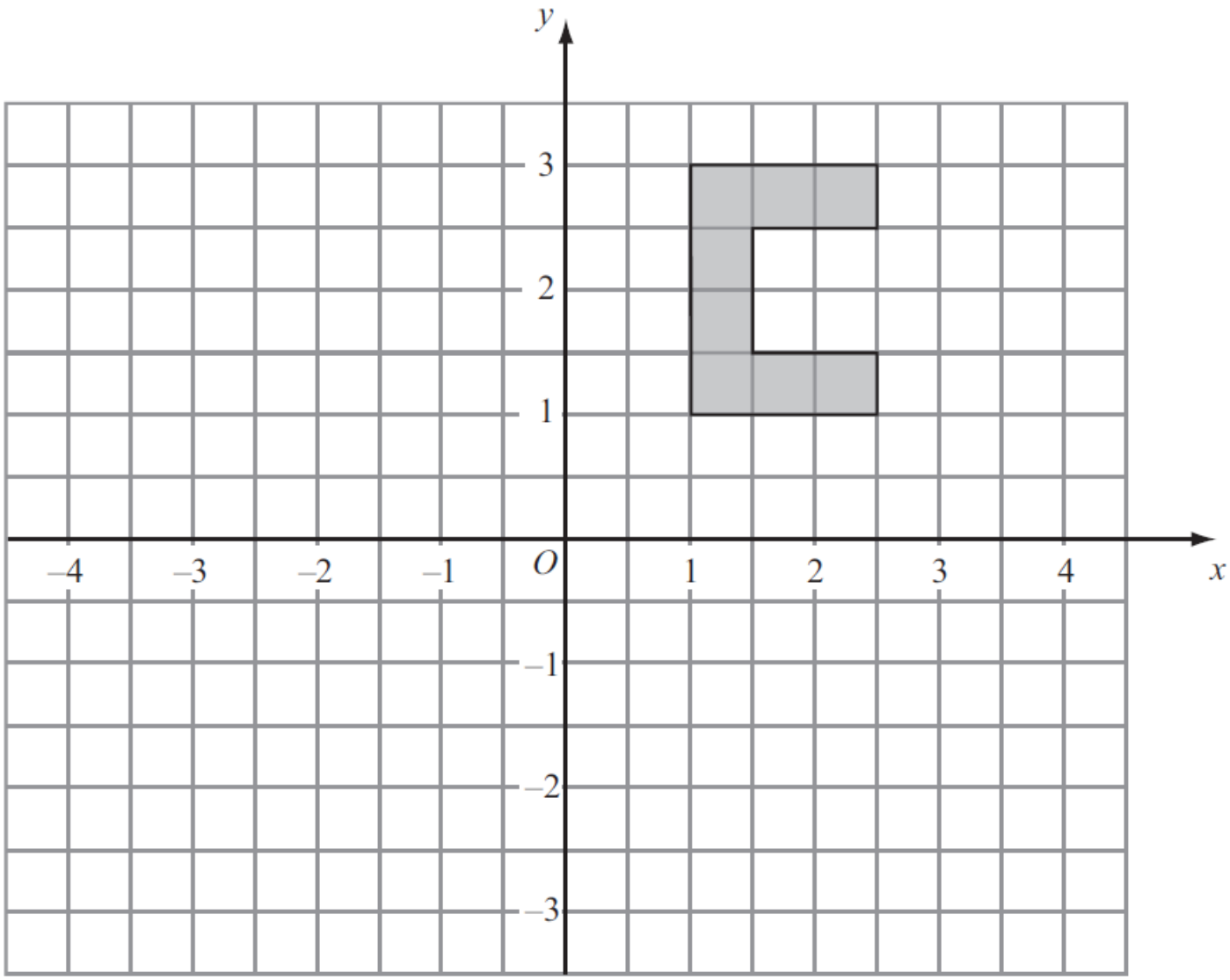
A and B are points on the circumference of a circle, centre O.
AC and BC are tangents to the circle.

Angle $ACB = 40°$.

Find the size of angle ABO.

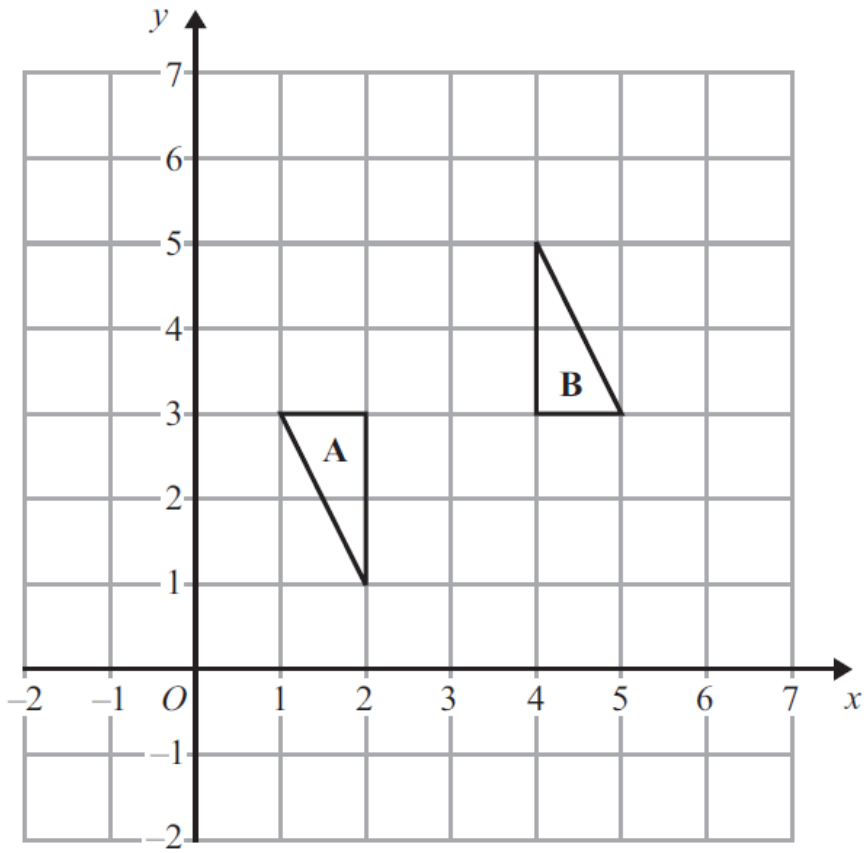
.....°

(Total 3 marks)



Rotate the shape 90° clockwise, centre O.

(Total 2 marks)

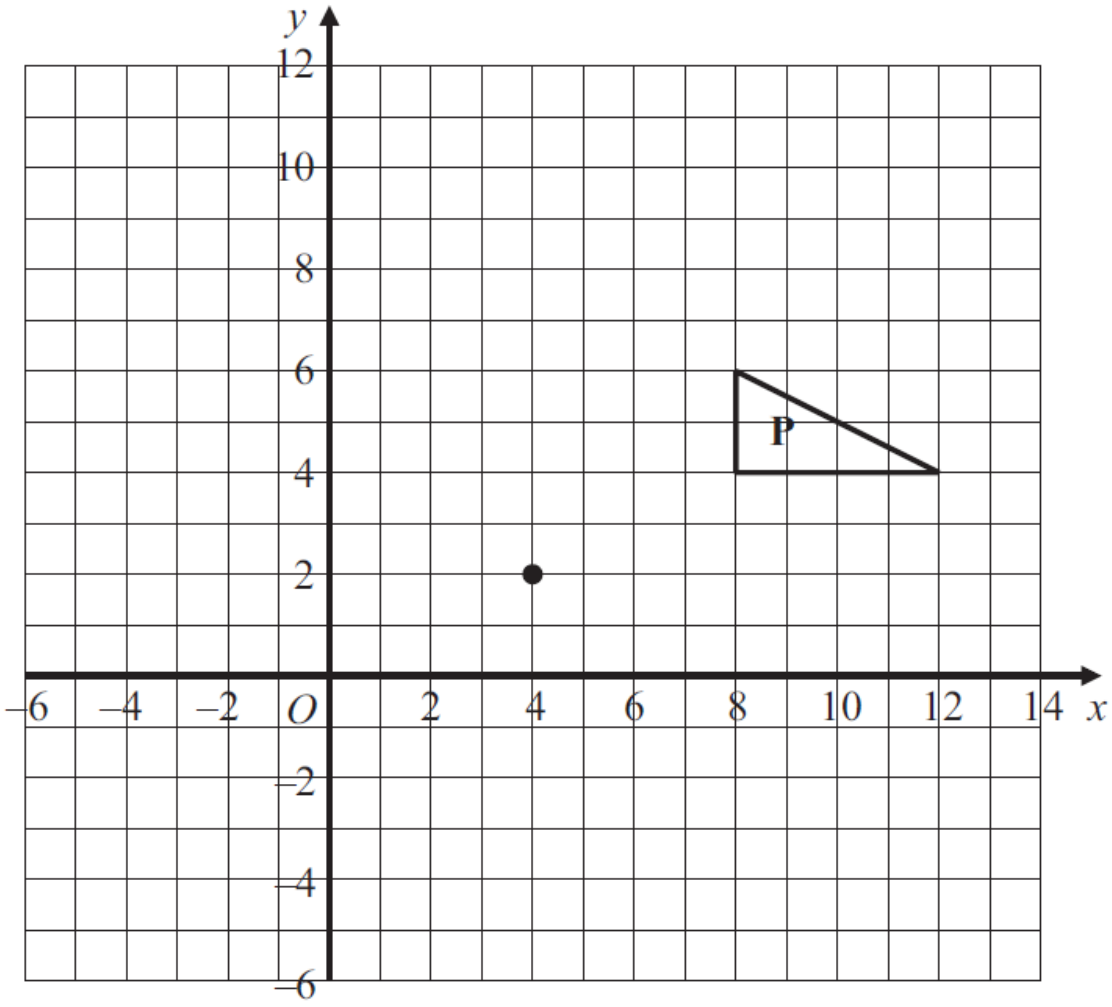


Describe fully the single transformation that maps triangle **A** onto triangle **B**.

.....

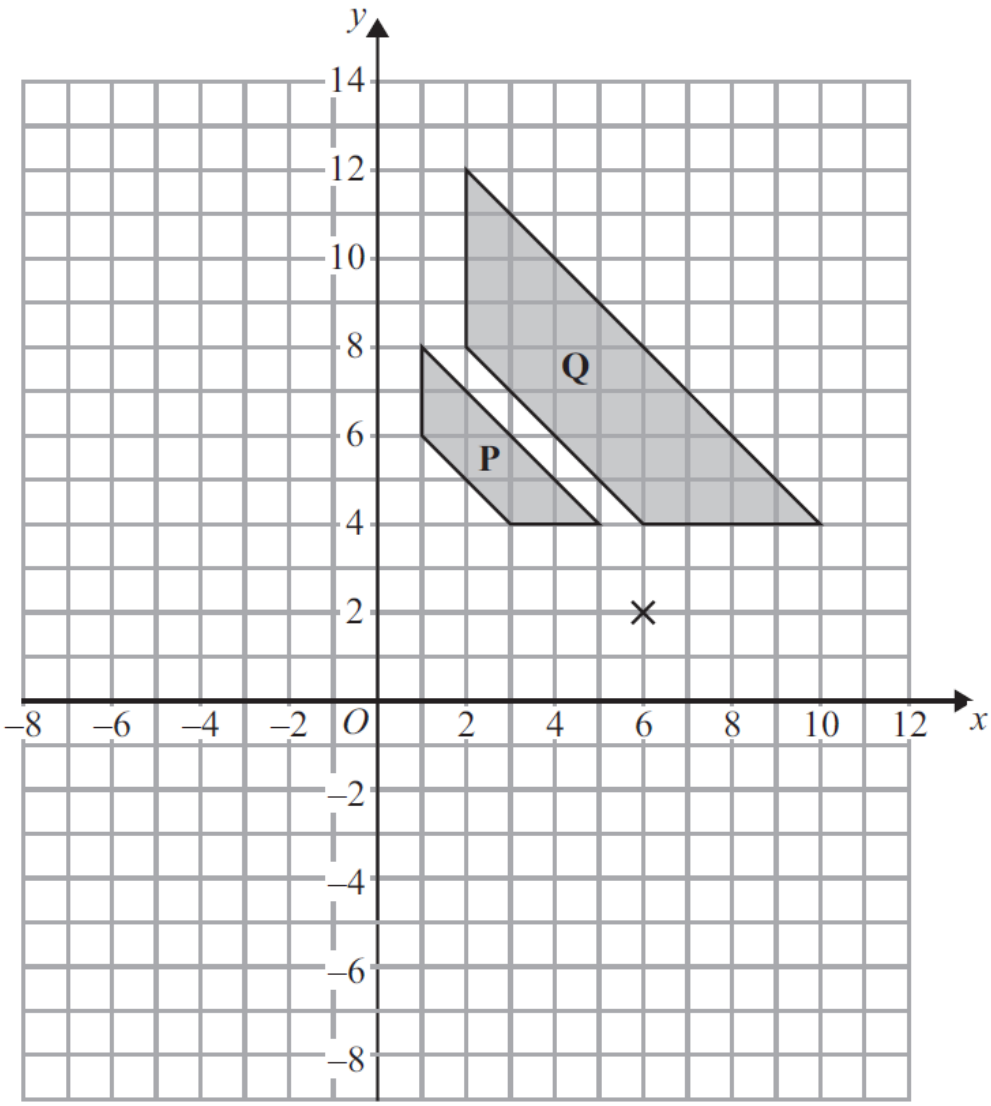
.....

(Total for Question 9 is 3 marks)



On the grid, enlarge triangle **P** with scale factor $\frac{1}{2}$ and centre (4, 2).

(2)

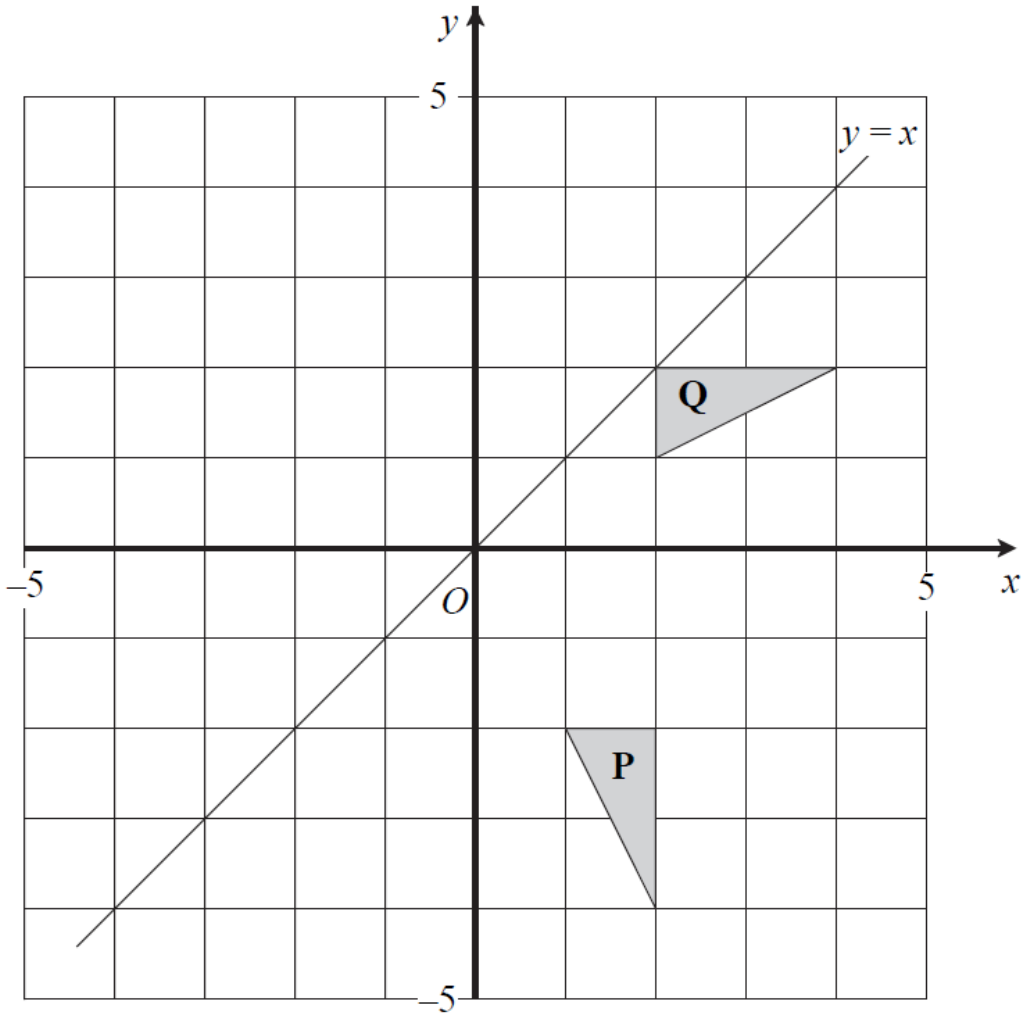


(a) Describe fully the single transformation that maps shape **P** onto shape **Q**.

.....

.....

(3)



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

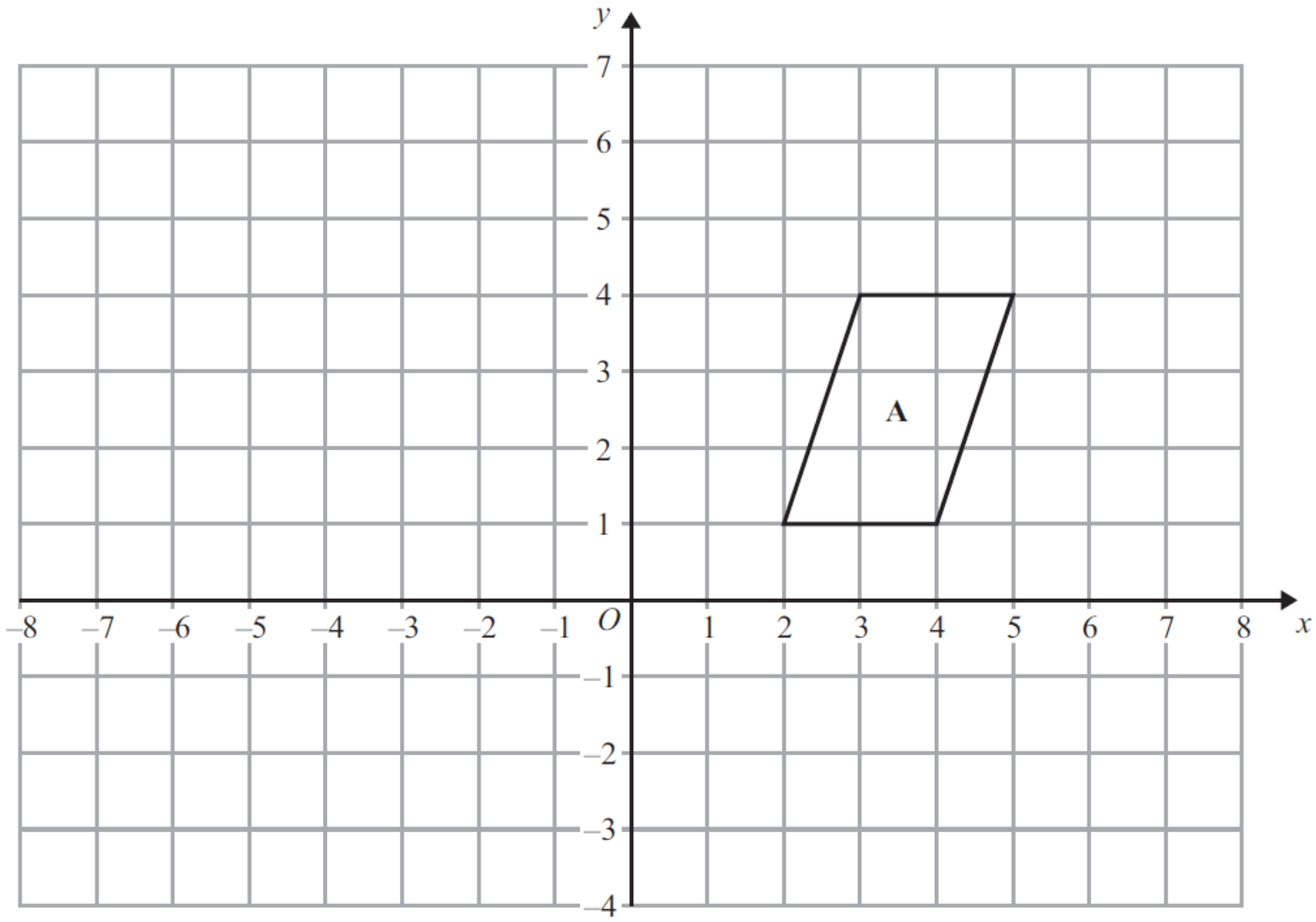
.....

.....

(3)

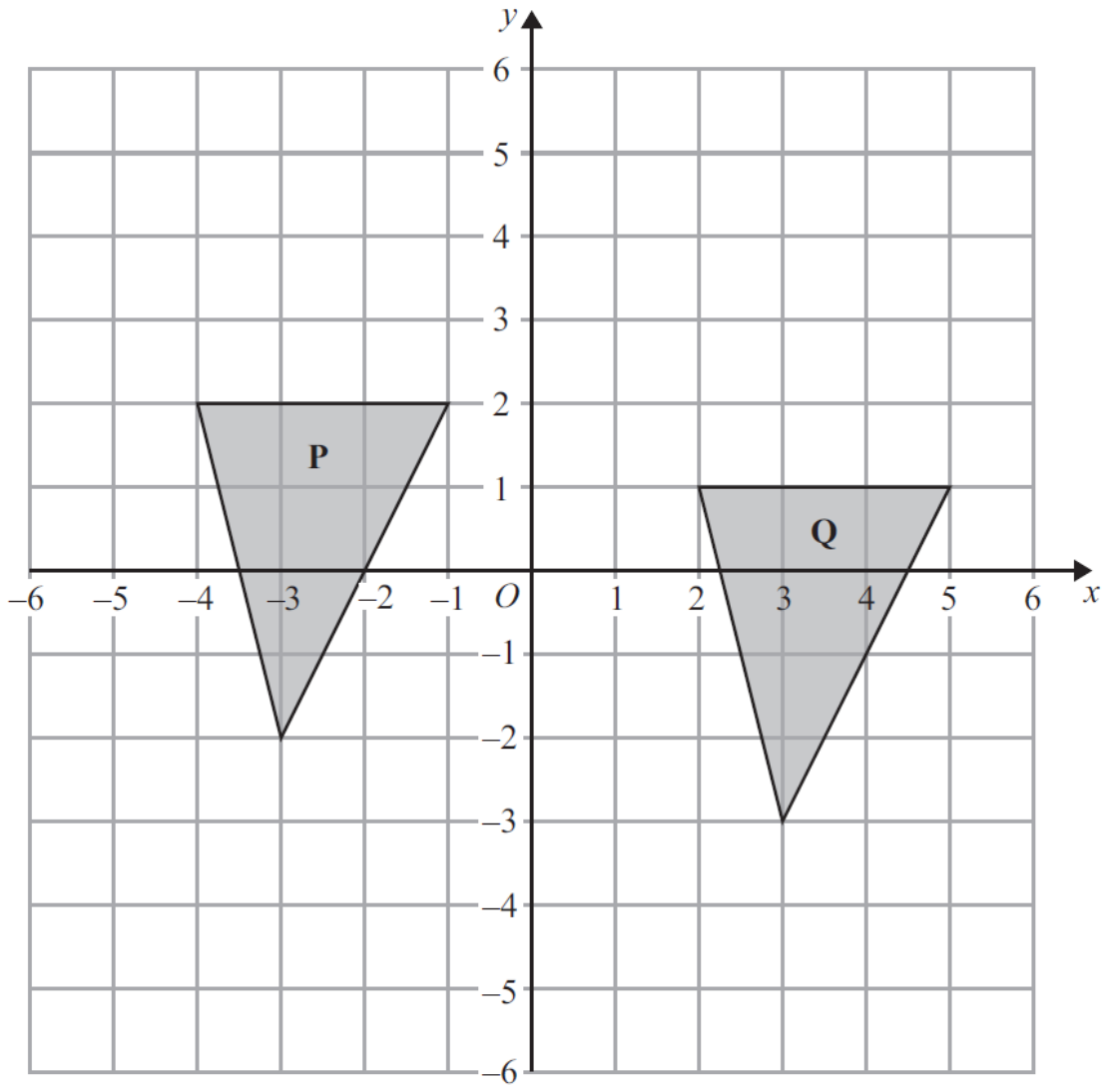
(b) Reflect triangle **Q** in the line with equation $y = x$.

(2)



(a) Translate shape **A** by the vector $\begin{pmatrix} -3 \\ 2 \end{pmatrix}$.

(1)

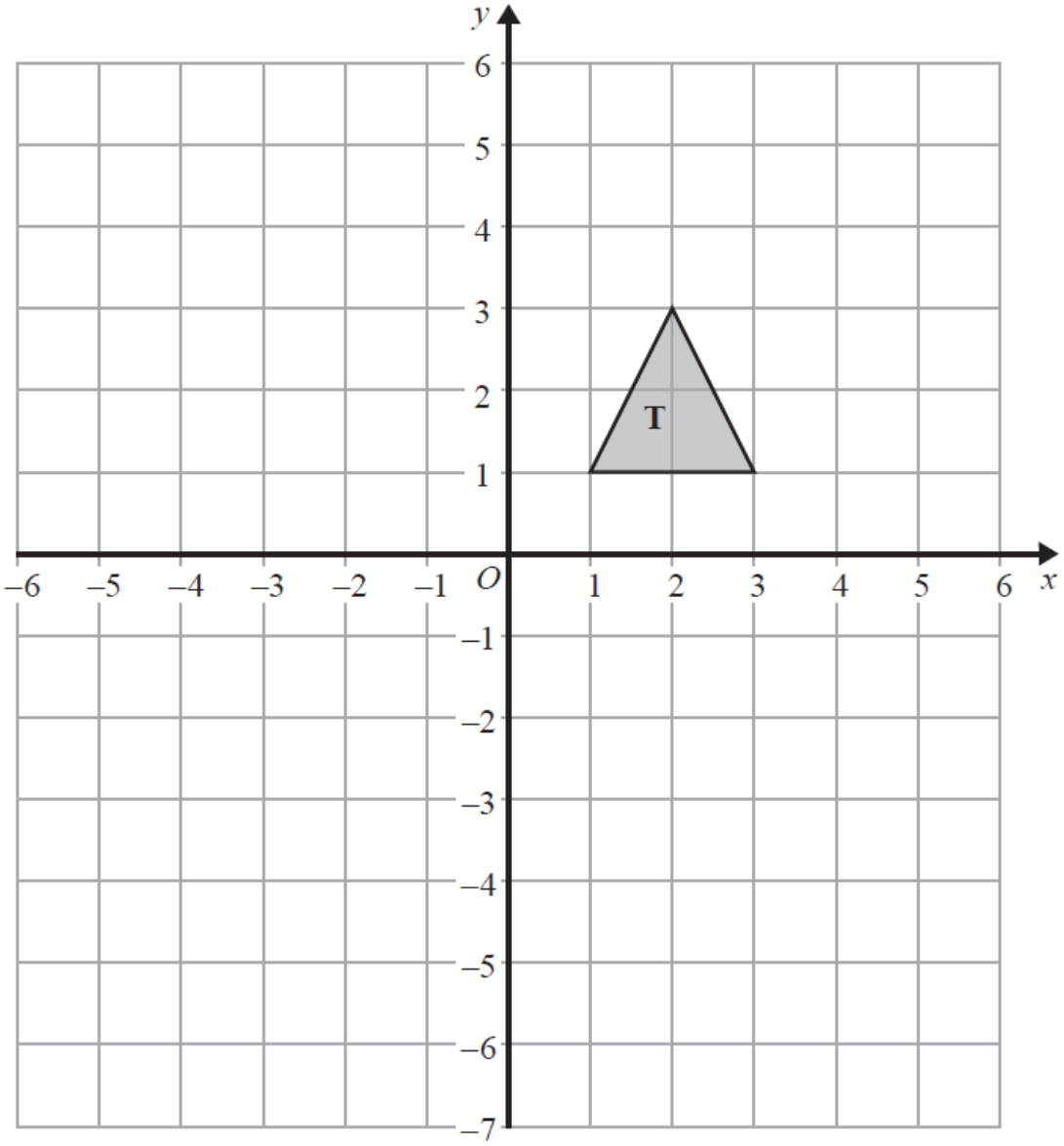


Describe fully the single transformation that maps triangle **P** onto triangle **Q**.

.....

.....

(Total for Question 10 is 2 marks)



Shape **T** is reflected in the line $x = -1$ to give shape **R**.
Shape **R** is reflected in the line $y = -2$ to give shape **S**.

Describe the **single** transformation that will map shape **T** to shape **S**.

.....

.....

.....

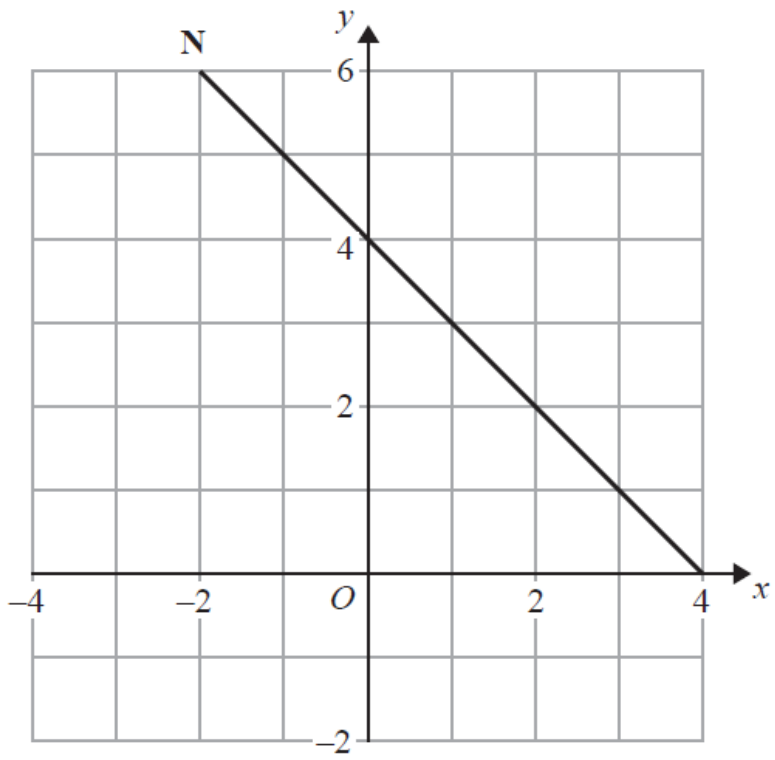
(Total for Question 7 is 2 marks)

Make v the subject of the formula $t = \frac{v}{5} + 2$

$v =$ .....

(Total 2 marks)

The line **N** is drawn on the grid below.



(b) Find an equation of the line **N**.

.....

(3)

(a) ABC is a right-angled triangle.

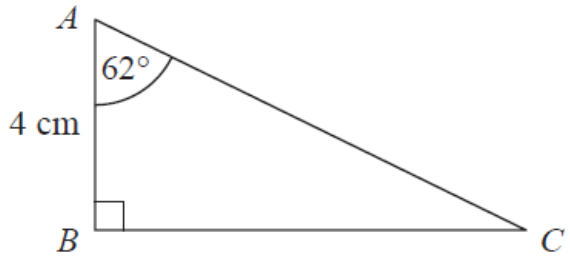


Diagram **NOT** accurately drawn

$AB = 4$ cm
Angle $CAB = 62°$

Work out the length of BC.
Give your answer correct to 3 significant figures.

..... cm

(3)

(b) PQR is a right-angled triangle.

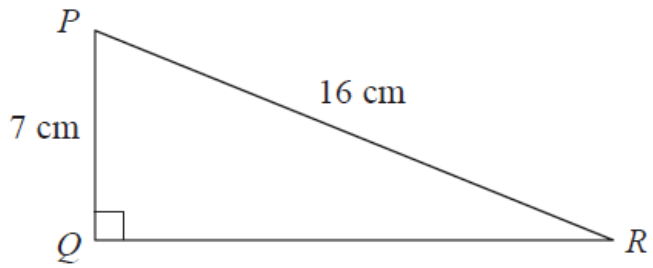


Diagram **NOT** accurately drawn

$PQ = 7$ cm
$PR = 16$ cm

Work out the size of the angle PRQ.
Give your answer correct to 3 significant figures.

.....°

(3)

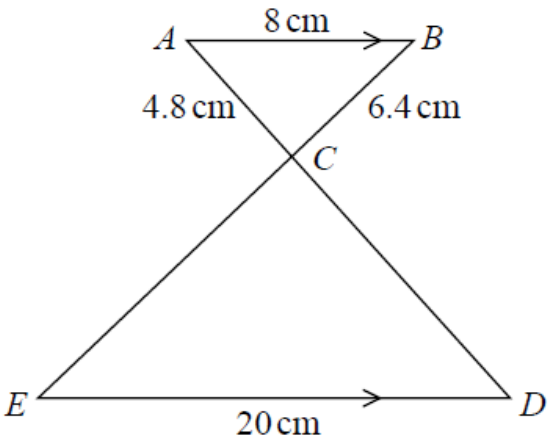


Diagram **NOT** accurately drawn

AB is parallel to *ED*.
ACD and *BCE* are straight lines.

AB = 8 cm
AC = 4.8 cm
BC = 6.4 cm
ED = 20 cm

Work out the length of *BE*.

..... cm

(Total for Question 20 is 3 marks)

Grade 1-3

Here are the first five terms of a number sequence.

2 6 10 14 18

(a) Write down the next two terms of the sequence.

....., ...

(1)

(b) Explain how you worked out your answer.

.....

(1)

(c) Find the 11th term of the sequence.

.....

(1)

(d) Explain why 95 cannot be a term of the sequence.

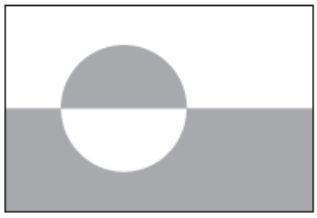
.....

.....

(1)

(Total for Question 4 is 4 marks)

Here are 9 flags.



A

B

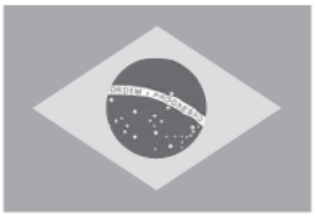
C

D

E

F

G



H

I

(a) Write down the letter of the flag which has

(i) exactly one line of symmetry

.....

(ii) rotational symmetry of order 4

.....

(iii) 2 lines of symmetry and rotational symmetry of order 2

.....

(iv) no lines of symmetry and rotational symmetry of order 2

.....

(4)

(b) Write down the letter of the flag which has a rhombus on it.

.....

(1)

This rule can be used to work out the shortest distance from the screen a viewer should sit to watch TV.

Multiply the width of the screen by 3

Greg is going to watch his TV.
The width of the screen is 65 cm.

(a) Work out the shortest distance from the screen he should sit.

..... cm

(1)

Rashida is going to watch her TV.
The shortest distance from the screen she should sit is 249 cm.

(b) Work out the width of the screen.

..... cm

(2)

The width of a TV screen is w cm.
The shortest distance from the screen a viewer should sit to watch this TV is d cm.

(c) Write down a formula for d in terms of w.

.....

(2)

(Total for Question 8 is 5 marks)

Richard is going to cover a bathroom wall with tiles.

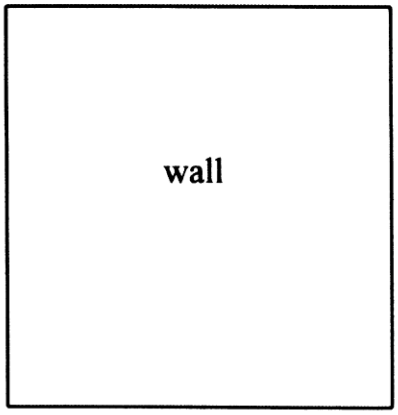
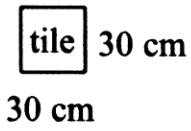


Diagram **NOT** accurately drawn



The wall is in the shape of a rectangle.
The wall is 1.8 m long and 2.4 m high.

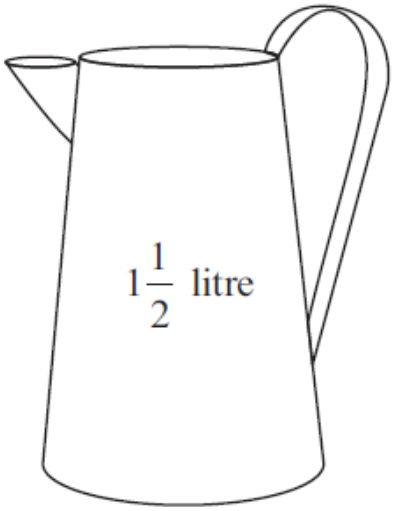
The tiles are squares with sides of 30 cm.

There are 14 tiles in a box.

How many boxes of tiles does Richard need?
You must show all your working.

.....

(Total for Question 11 is 5 marks)



There are $1\frac{1}{2}$ litres of juice in a jug.

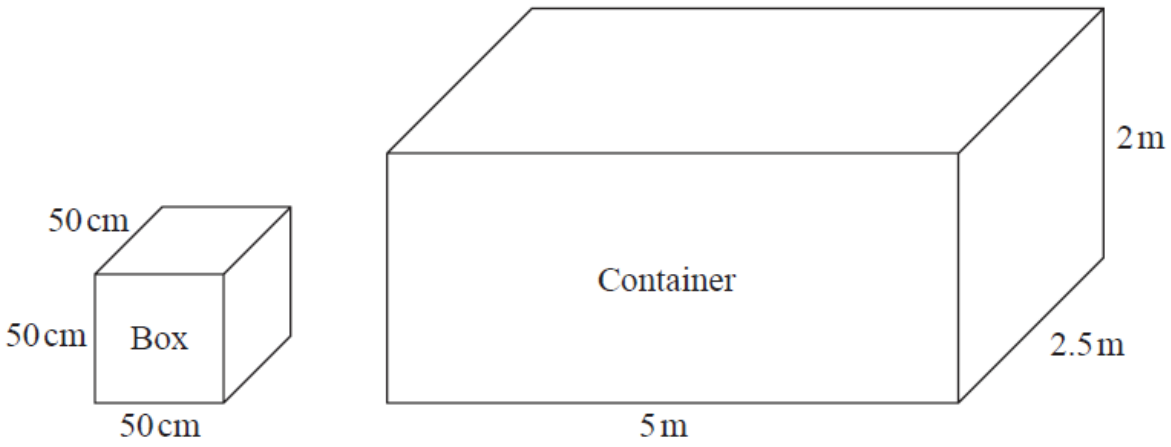
Lisa is going to pour the juice into some glasses.
She will fill each glass with 175 ml of juice.

Work out the greatest number of glasses she can fill.

.....

(Total 4 marks)

Diagram **NOT** accurately drawn



Chao transports microwave ovens from China to the UK.

He puts each microwave oven in a box.
Each box is a cube of side 50 cm.

He then puts each box in a container.
Each container is a cuboid of size 5 m by 2.5 m by 2 m.

Chao has 500 boxes.
He has 3 containers.

Will the 500 boxes fit into these 3 containers?

(Total for Question 4 is 4 marks)

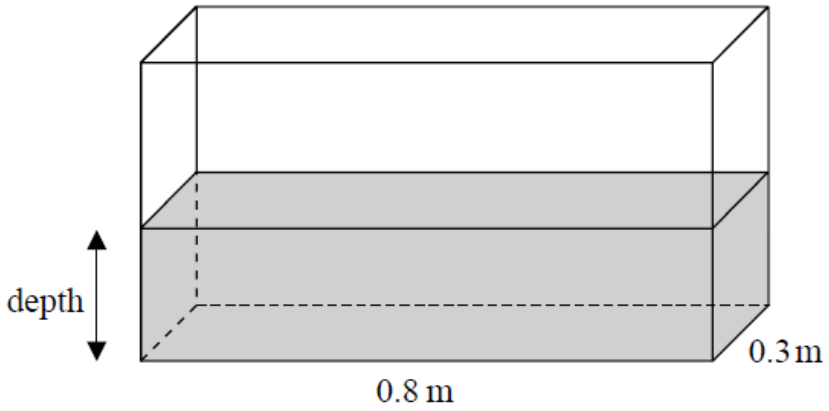


Diagram **NOT** accurately drawn

A fish tank is in the shape of a cuboid.
The length of the fish tank is 0.8 m and the width is 0.3 m.
The volume of water in the fish tank is 108 litres.

$1\ m^3 = 1000$ litres.

Work out the depth of the water in the fish tank.

..... m

(Total for Question 10 is 3 marks)

(a) Find the value of $\sqrt{46.24}$

.....

(1)

(b) Find the value of 9^3

.....

(1)

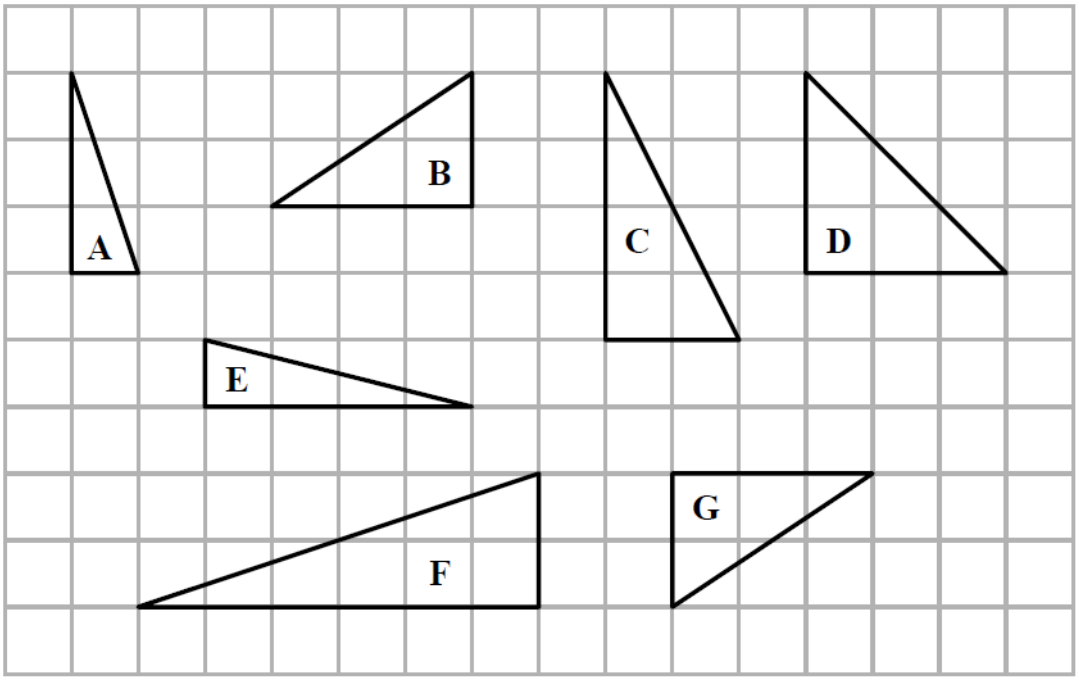
(c) Find the cube root of 19.683

.....

(1)

(Total for Question 8 is 3 marks)

Here are seven triangles drawn on a square grid.



(a) Write down the letters of the two triangles that are congruent.

..... , ...

(1)

(b) One of the triangles is similar to triangle **A**.
Write down the letter of this triangle.

.....

(1)

(c) One of the triangles is isosceles.
Write down the letter of this triangle.

.....

(1)

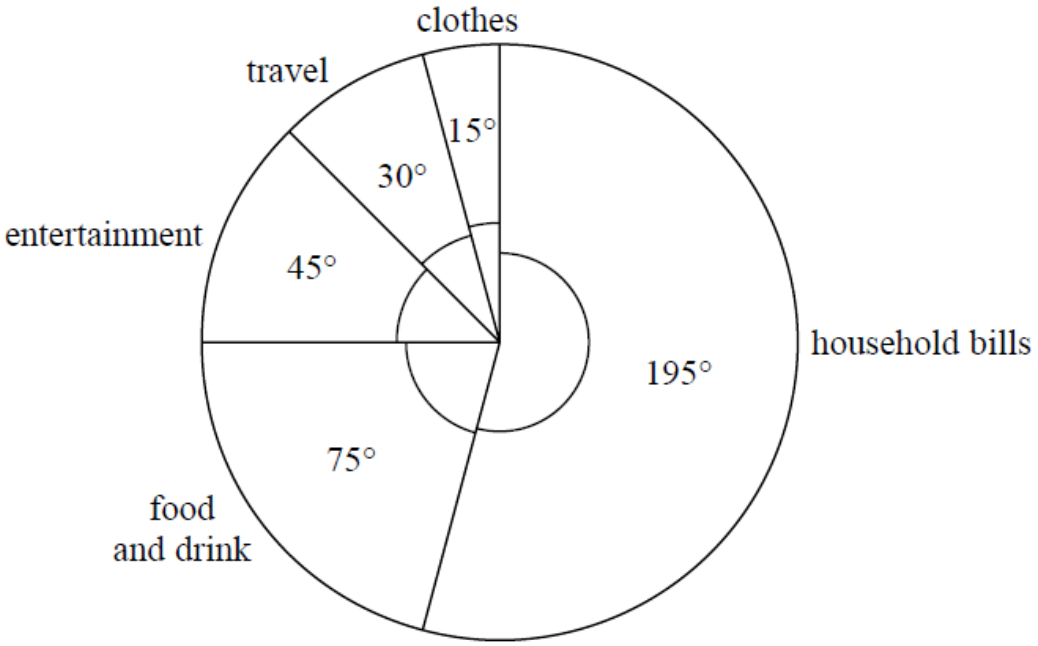
(Total for Question 6 is 3 marks)

Expand and simplify $(e + 3)(e - 5)$

.....

(2)

The pie chart shows information about Andrew's spending last month.



Andrew spent \$80 on travel last month.

(a) Work out the amount Andrew spent on household bills last month.

\$.....

(3)

A second pie chart is to be drawn for Cathy's spending.
Cathy spent a total of \$800 last month.
She spent \$120 on entertainment last month.

(b) Calculate the size of the angle for entertainment in the second pie chart.

.....°

(2)

(Total for Question 11 is 5 marks)

The diagram shows the floor plan of a room in Kate's house.

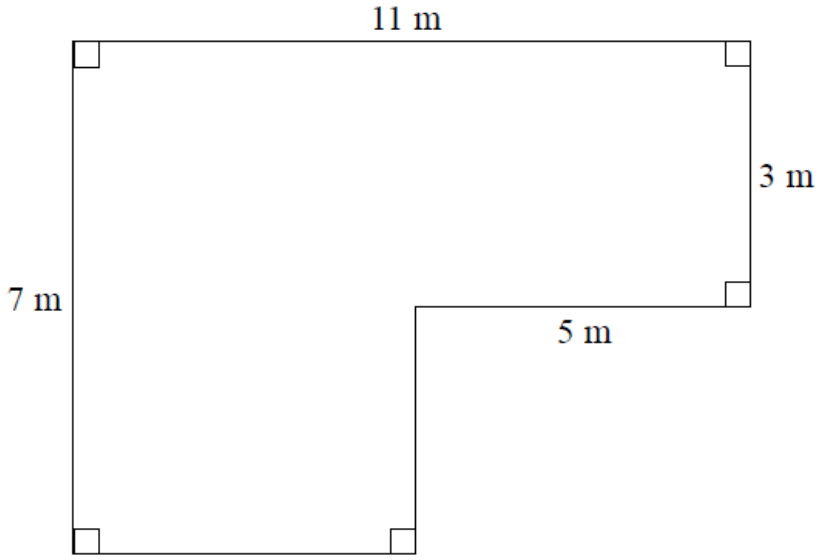


Diagram **NOT** accurately drawn

Kate is going to cover the floor with tiles.
She is going to buy some packs of tiles.

The tiles in each pack of tiles cover 2 m^2 of floor.
Each pack of tiles costs £24.80

Work out how much it will cost Kate to buy the packs of tiles she needs.

£.....

(Total for Question 12 is 5 marks)

A has coordinates $(3, 6)$
B has coordinates $(-5, 8)$

Work out the coordinates of the midpoint of AB.

(.....,.....)

(Total for Question 14 is 2 marks)

---

2 kilograms of grapes cost £6.20
500 grams of grapes and 3 kilograms of plums cost £11.60

Work out the cost of 1 kilogram of plums.

£.....

(Total for Question 14 is 3 marks)

Jenna travelled from London to Edinburgh by coach.
The coach left London at 21 10 on Monday.
The coach arrived in Edinburgh at 06 45 on Tuesday.

(a) How long did the coach take to travel from London to Edinburgh?
Give your answer in hours and minutes.

..... hours ..... minutes

(2)

A bus travelled a distance of 493 km from Paris to Zurich.

The bus took $11\frac{1}{4}$ hours to travel from Paris to Zurich.

(b) Work out the average speed of the bus.
Give your answer, in km/h, correct to the nearest whole number.

..... km/h

(2)

(Total for Question 11 is 4 marks)

Calvin has 8 identical rectangular tiles and 4 identical square tiles.
He arranges the tiles to fit exactly round the edge of a rectangle, as shown in the diagram below.

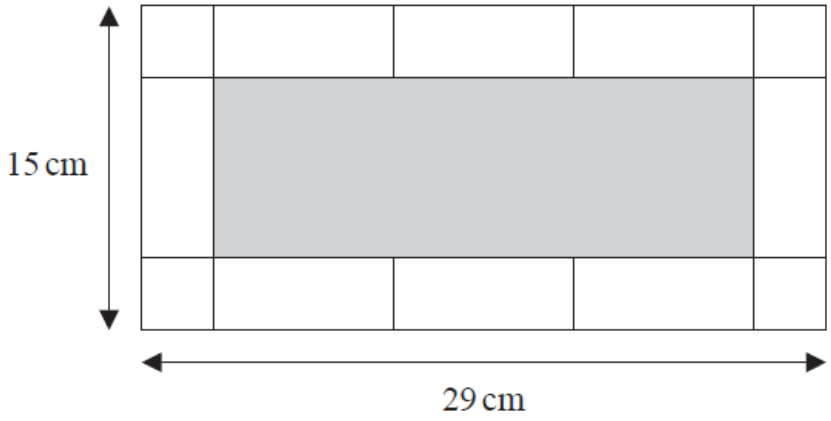


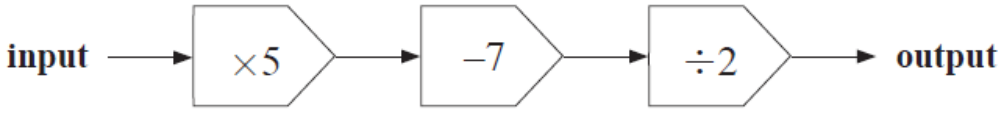
Diagram **NOT** accurately drawn

Work out the area of one of Calvin's rectangular tiles.

..... cm^2

(Total for Question 14 is 5 marks)

Here is a number machine.



(a) Work out the output when the input is 15

.....

(1)

(b) Work out the input when the output is 124

.....

(2)

The input is p.
The output is T.

(c) Write down a formula for T in terms of p.

.....

(2)

Work out the value of $x^2 - 5x$ when $x = -3$

.....

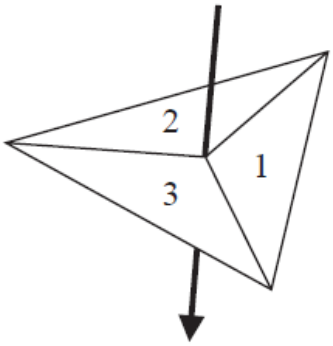
(2)

The table shows how much protein, fat, fibre and salt women and men need each day.

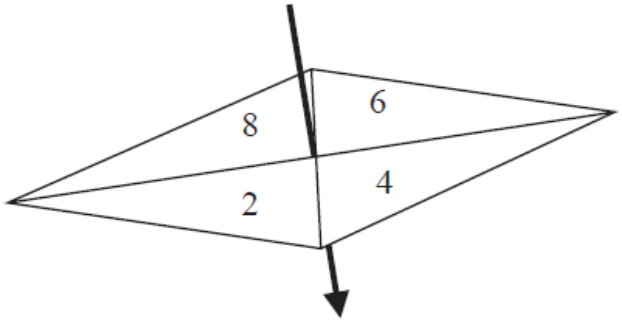
	Women	**Men**
Protein	45 g	55 g
Fat	70 g	95 g
Fibre	25 g	25 g
Salt	5 g	5 g

Show this information in a suitable chart or diagram.

Hanako has two fair spinners.
Spinner **A** is 3-sided and can land on 1, 2 or 3
Spinner **B** is 4-sided and can land on 2, 4, 6 or 8



Spinner **A**



Spinner **B**

Hanako spins each spinner once.

She adds together the number that spinner **A** lands on and the number that spinner **B** lands on to get her total score.

(a) Complete the table to show all possible total scores.
Four total scores have been done for you.

Spinner **A**

Spinner **B**	**1**	**2**	**3**
2	3		
4		6	
6		8	9
8			

(2)

(b) Find the probability that

(i) Hanako's total score is 8

.....

(ii) Hanako's total score is less than 7

.....

(2)

(a) Write these numbers in order of size.

$\frac{2}{3}$ $\frac{7}{11}$ 60% $\frac{5}{8}$ 0.613

Start with the smallest number.

.....

(3)

(b) Find the value of $\sqrt[3]{175.616}$

.....

(1)

(c) Find the square of -4.1

.....

(1)

(d) (i) Work out the value of $\frac{\sqrt{2.9 \times 3.76}}{4.2 - 0.63}$

Write down all the figures on your calculator display.

.....

(2)

(ii) Give your answer to part (d) (i) correct to 3 significant figures.

.....

(1)

The width of a rectangle is 8 cm less than the length of the rectangle.
The perimeter of the rectangle is 54 cm.

Find the area of the rectangle.

..... cm^2

(Total for Question 12 is 4 marks)

Simplify $(2m^3)^4$

.....

(2)

There are some people in a cinema.

$\frac{3}{5}$ of the people in the cinema are children.

For the children in the cinema,

number of girls : number of boys = 2 : 7

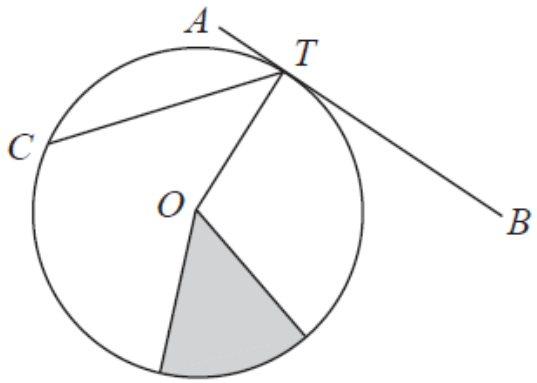
There are 170 girls in the cinema.

Work out the number of adults in the cinema.

.....

(Total for Question 13 is 5 marks)

O is the centre of the circle.



The line AB touches the circle at T.

(a) Write down the mathematical name for the line

(i) OT,

.....

(ii) CT,

.....

(iii) AB.

.....

(3)

(b) Write down the mathematical name for the shaded region.

.....

(1)

Find the cube root of 6859

.....

(1)

$y = c - dx$

$c = 15$
$d = 8$
$x = -4$

(a) Work out the value of y.

$y =$ .....

(2)

$t = 4(p - q)$

$t = 18$
$q = 6$

(b) Work out the value of p.

$p =$ .....

(2)

(Total for Question 14 is 4 marks)

Sahil has a fish tank in the shape of a cuboid, as shown in the diagram.

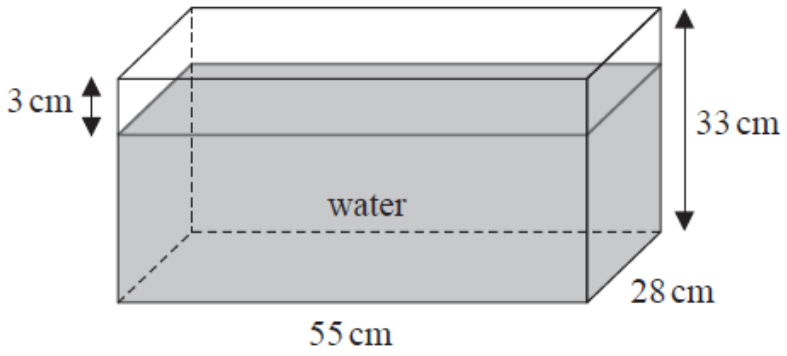


Diagram **NOT** accurately drawn

The tank is

55 cm long
28 cm wide
33 cm high

The surface of the water in the tank is 3 cm below the top of the tank.

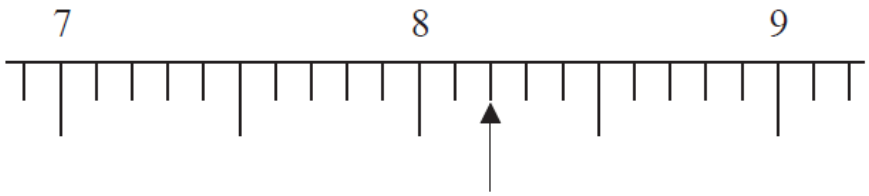
Sahil is going to put some neon tetra fish in his tank.
He must allow 4 litres of water for each of the neon tetra fish he puts in the tank.

What is the greatest number of neon tetra fish Sahil can put in his tank?

.....

(Total for Question 9 is 4 marks)

(a)

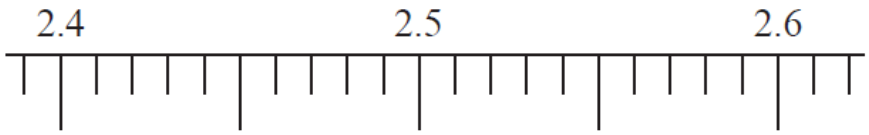


Write down the number marked with an arrow.

.....

(1)

(b)



(i) Mark with an arrow the number 2.48

(ii) Write down the value of the 8 in the number 2.48

.....

(iii) Round 2.48 to the nearest whole number.

.....

(3)

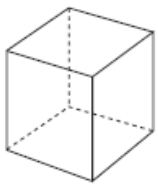
(c) Write down the number which is exactly halfway between 2.48 and 2.49

.....

(1)

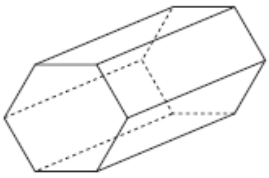
(a) Write down the mathematical name for each of these 3-D shapes.

(i)



.....

(ii)



.....

(iii)

.....

(3)

(b) (i) How many faces has shape (i)?

.....

(ii) How many edges has shape (ii)?

.....

(2)

A circle has radius 9 cm.

(a) Work out the circumference of the circle.
Give your answer correct to 1 decimal place.

..... cm

(2)

The diagram shows the pentagon *ABCDE*.

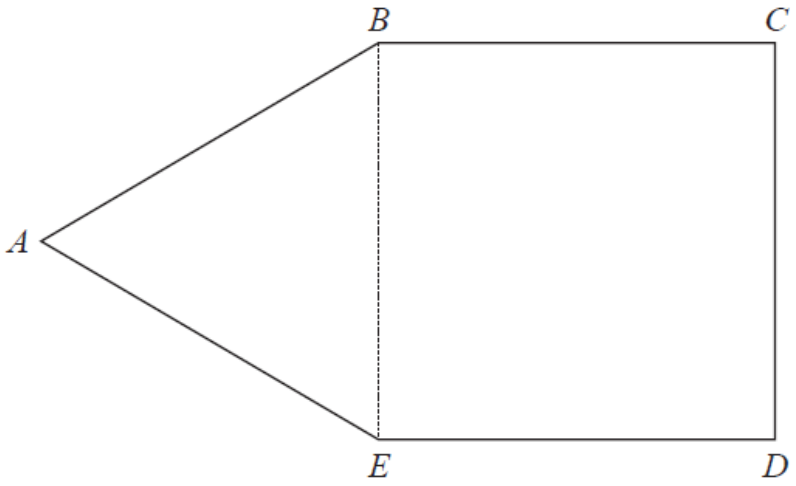


Diagram **NOT** accurately drawn

ABE is an equilateral triangle.

BCDE is a square with area 169 cm^2

(b) Work out the perimeter of *ABCDE*.

..... cm

(3)

(Total for Question 12 is 5 marks)

80 students studying sciences were asked which science subject they liked the best.

Some information about the results is shown in the two-way table.

	Biology	Chemistry	Physics	Total
Boys	25		7	
Girls		4		43
Total	31			80

(a) Complete the two-way table.

(3)

One of the students is picked at random.

(b) Write down the probability that this student is a girl.

.....

(1)

One of the girls is picked at random.

(c) Write down the probability that this girl likes Chemistry the best.

.....

(2)

(Total for Question 6 is 6 marks)

There are 130 adults at a language school.
Each adult studies one of French or Spanish or German.

96 of the adults are women.
12 of the women study French.
73 of the adults study Spanish.
55 of the women study Spanish.
9 of the men study German.

How many of the adults study French?

.....

(Total for Question 6 is 4 marks)