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EDEXCEL INTERNATIONAL GCSE MATHS: QUESTIONS BY TOPIC

Angles, Polygons & Bearings (G1)

International GCSE Mathematics A (4MA1) · Foundation tier

108 questions · 418 marks · Mark schemes included

Past papers June 2018 - June 2025 · 3 sub-topics

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HOW TO USE THIS BOOKLET

Questions are grouped by sub-topic and run from the lowest to the highest mark tariff, then oldest paper first.
Click any row below to jump straight to that sub-topic or question.
On every question page, click ANSWER in the top-right corner to jump to its mark scheme; < QUESTION brings you back.
A gold bar in the left margin marks exactly where the question sits on the original page.
Diagrams, graphs, grids and tables are printed exactly as they appear in the original papers.
Each question is filed under its main topic; longer questions may also test skills from other topics.

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G1a	**ANGLE FACTS & PARALLEL LINES**		34 Qs · 139 marks	**4**
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4.	**Q15**	IGCSE Paper 2F June 2018	3	**8**
5.	**Q10**	IGCSE Paper 1FR January 2021	3	**9**
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18.	**Q15**	IGCSE Paper 2F January 2023	4	**22**
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21.	**Q7**	IGCSE Paper 1F November 2024	4	**25**
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QUESTIONS

108 questions · 418 marks · 3 sub-topics

SUB-TOPIC G1a

ANGLE FACTS & PARALLEL LINES

Sub-topic G1a · 34 questions · 139 marks · lowest tariff first

11

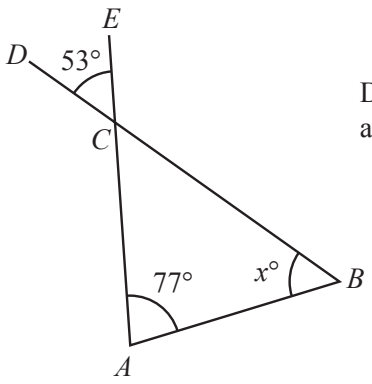


Diagram **NOT** accurately drawn

ABC is a triangle.
BCD and *ACE* are straight lines.

Work out the value of x

$x =$ .....

(Total for Question 11 is 2 marks)

12

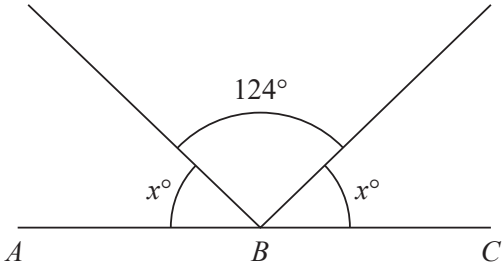


Diagram **NOT** accurately drawn

ABC is a straight line.
Work out the value of *x*.

x = ...

(Total for Question 12 is 3 marks)

13 Show that $\frac{7}{8} - \frac{1}{6} = \frac{17}{24}$

(Total for Question 13 is 2 marks)

21

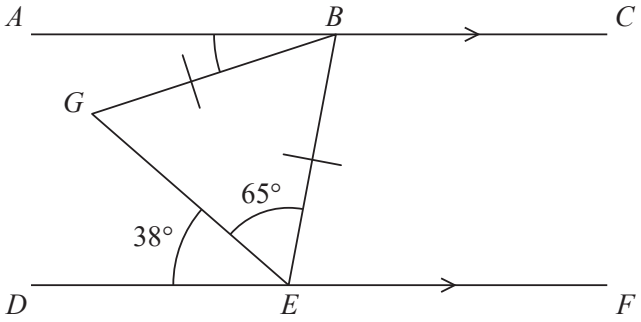


Diagram **NOT** accurately drawn

ABC and *DEF* are parallel lines.

BG = *BE*
Angle *DEG* = 38°
Angle *GEB* = 65°

Find the size of angle *ABG*.

.....°

(Total for Question 21 is 3 marks)

15

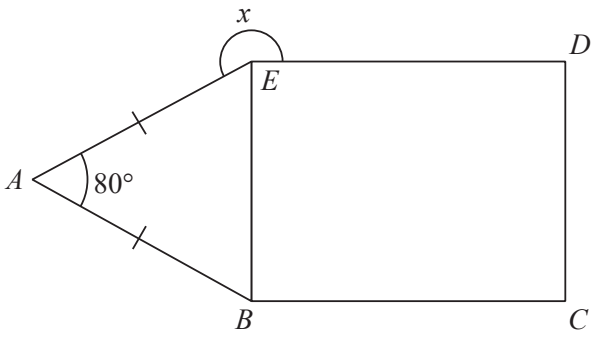


Diagram **NOT** accurately drawn

BCDE is a rectangle.
ABE is an isosceles triangle.

AB = *AE*
Angle *BAE* = 80°

Work out the size of angle *x*.

.....°

(Total for Question 15 is 3 marks)

10 The diagram shows the isosceles triangle ABC in which $AB = AC$

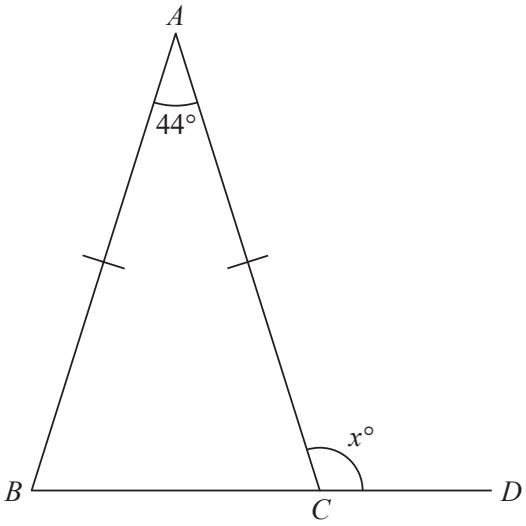


Diagram **NOT** accurately drawn

BCD is a straight line.

Work out the value of x.

$x =$ .....

(Total for Question 10 is 3 marks)

11

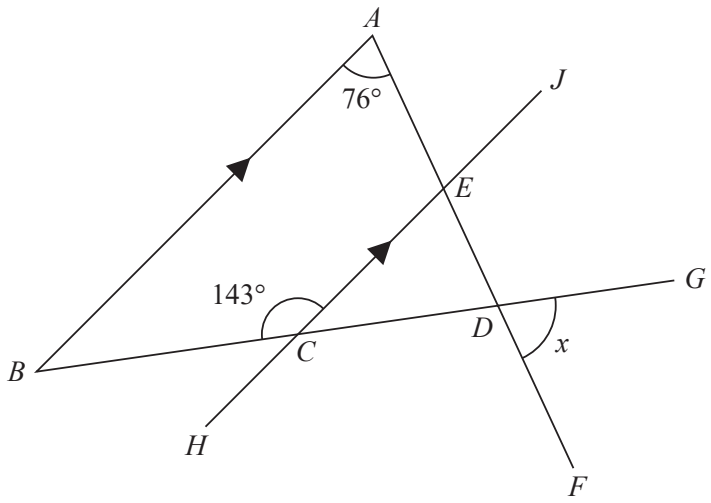


Diagram **NOT** accurately drawn

ABD is a triangle.

AEDF, *BCDG* and *HCEJ* are straight lines.
BA is parallel to *HCEJ*.

Work out the size of the angle marked *x*.

.....°

(Total for Question 11 is 3 marks)

12 The diagram below shows the trapezium $PQRS$

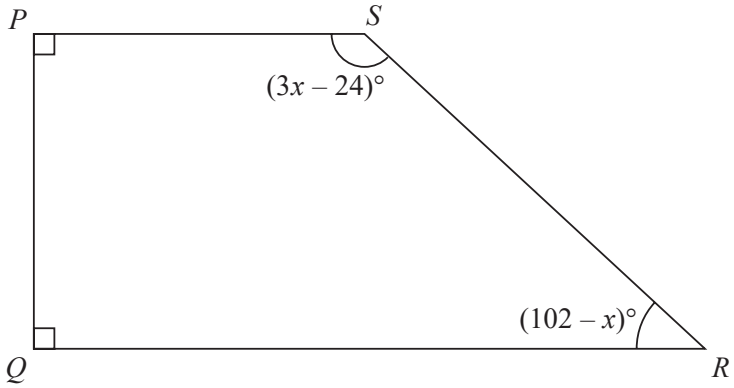


Diagram **NOT** accurately drawn

Angle PQR and angle QPS are right angles.

Find the value of x

$x =$ .....

(Total for Question 12 is 3 marks)

9 The diagram shows quadrilateral $ABCD$

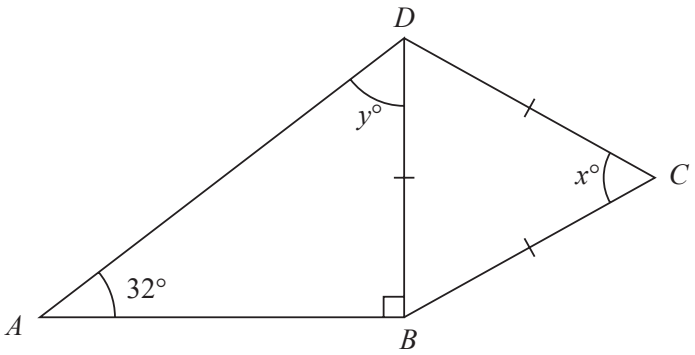


Diagram **NOT** accurately drawn

$BC = CD = DB$
angle $DBA = 90°$ and angle $DAB = 32°$

(a) Work out the value of x

$x =$ .....

(1)

(b) (i) Work out the value of y

$y =$ .....

(1)

(ii) Give a reason for your answer to (b)(i).

.....

.....

(1)

(Total for Question 9 is 3 marks)

8

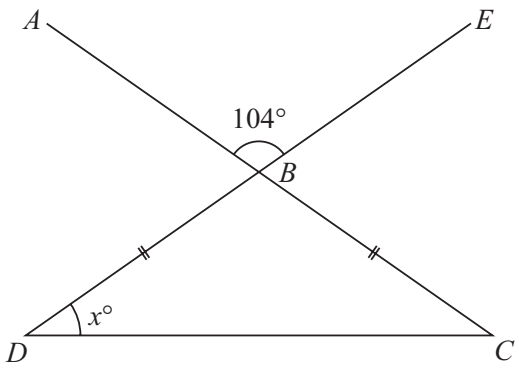


Diagram **NOT** accurately drawn

ABC and *EBD* are straight lines.
Triangle *BCD* is isosceles with $BD = BC$

Angle $ABE = 104°$

Work out the value of x

$x =$.....

(Total for Question 8 is 3 marks)

21 The diagram shows the triangle PQR.

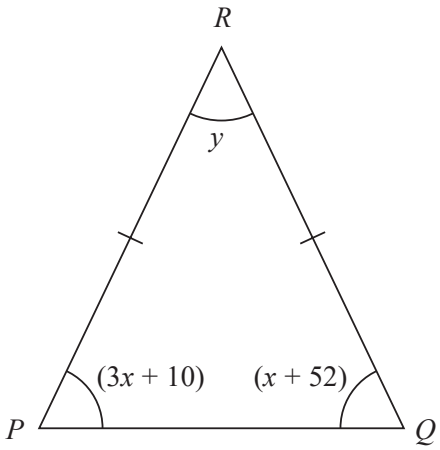


Diagram **NOT** accurately drawn

In the diagram, all the angles are in degrees.

$RP = RQ$

Find the value of y.
Show clear algebraic working.

$y =$

(Total for Question 21 is 4 marks)

14

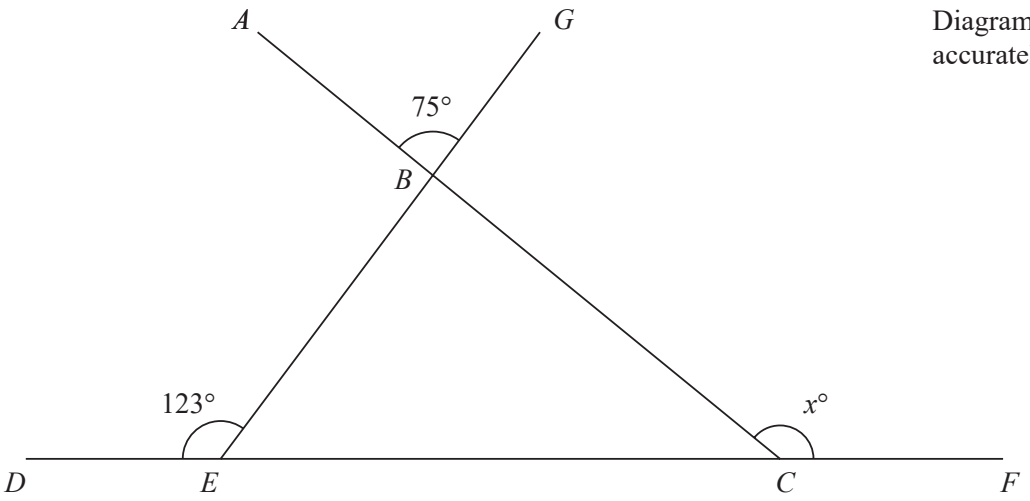


Diagram **NOT** accurately drawn

ABC, *DECF* and *EBG* are straight lines.

Work out the value of x.
Give a reason for each stage of your working.

$x =$

(Total for Question 14 is 4 marks)

20 The diagram shows a triangle.

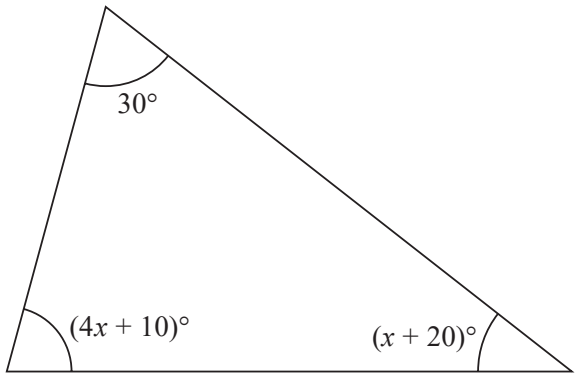


Diagram **NOT** accurately drawn

Work out the value of x.

$x =$ .....

(Total for Question 20 is 4 marks)

15

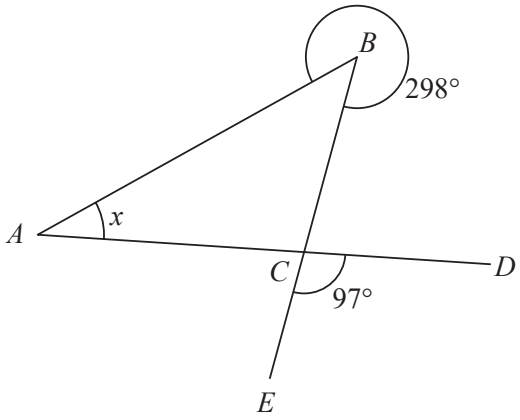


Diagram **NOT** accurately drawn

ABC is a triangle.
D and *E* are points such that *ACD* and *BCE* are straight lines.

reflex angle *ABC* = 298°
angle *ECD* = 97°

Work out the size of angle *x*.
Give a reason for each stage of your working.

x = ... °

(Total for Question 15 is 4 marks)

7 The diagram shows a trapezium $ABCD$ in which AB and DC are parallel.

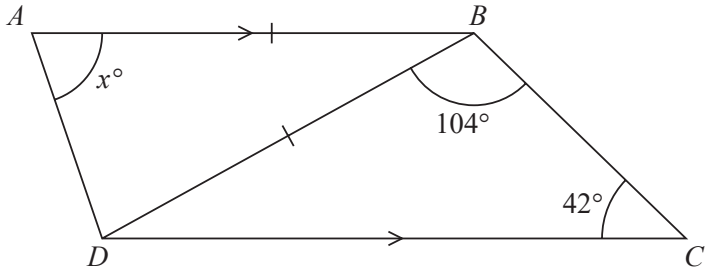


Diagram **NOT** accurately drawn

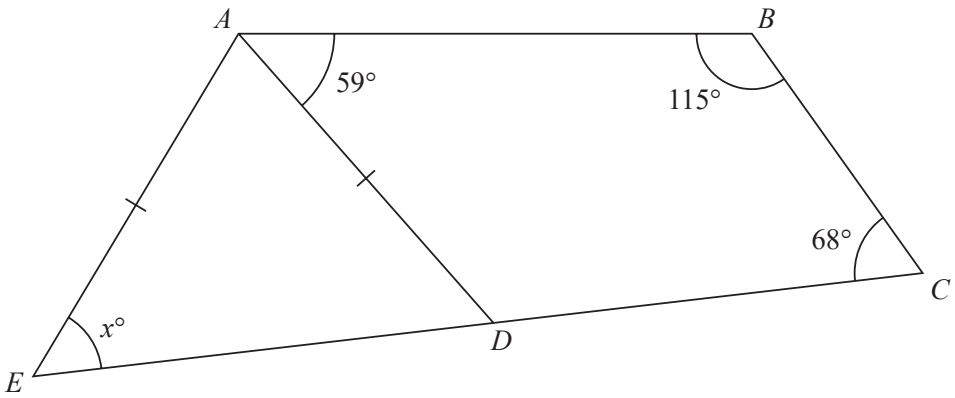
$AB = DB$

Work out the value of x.
Give a reason for each stage of your working.

$x =$ .....

(Total for Question 7 is 4 marks)

9 The diagram shows quadrilateral $ABCD$ and isosceles triangle ADE, where $AE = AD$.



EDC is a straight line.

Work out the value of x.
Give a reason for each stage of your working.

$x =$ .....

(Total for Question 9 is 4 marks)

9 The diagram shows triangle *ABD*

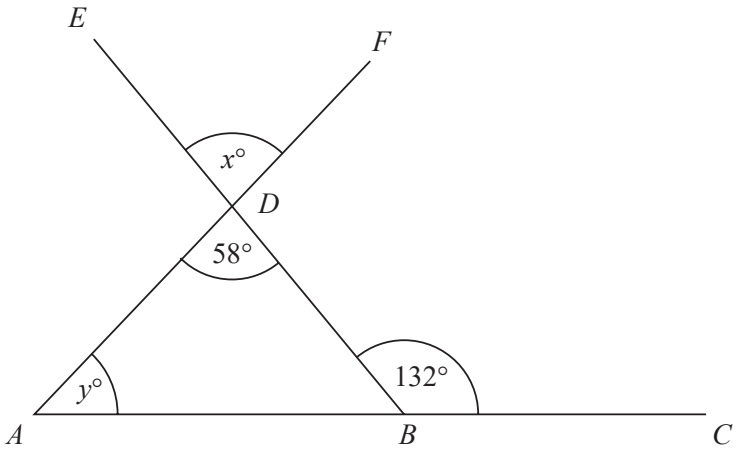


Diagram **NOT** accurately drawn

ABC, *BDE* and *ADF* are straight lines.

angle *CBD* = 132° angle *ADB* = 58°

(a) (i) Write down the value of *x*

x = ...

(ii) Give a reason for your answer.

.....

(2)

(b) Work out the value of *y*

y = ...

(2)

(Total for Question 9 is 4 marks)

9

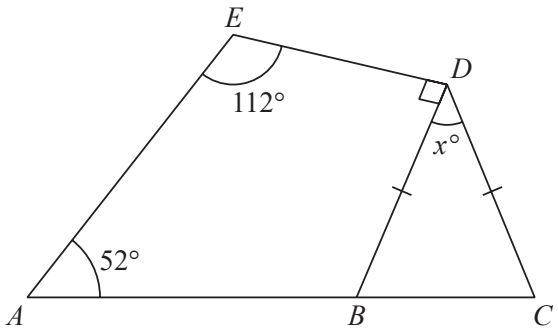


Diagram **NOT** accurately drawn

BCD is an isosceles triangle with *BD* = *CD*
ABC is a straight line.
ABDE is a quadrilateral.

Work out the value of *x*
Give a reason for each stage of your working.

x = ...

(Total for Question 9 is 4 marks)

15 The diagram shows two parallel lines AB and DEF

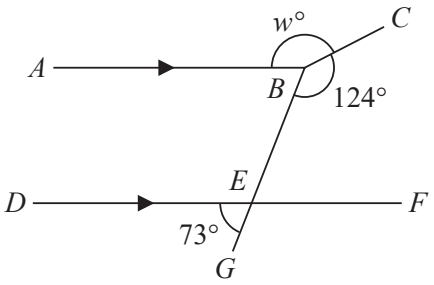


Diagram **NOT** accurately drawn

BEG is a straight line.

angle $DEG = 73°$ angle $EBC = 124°$ angle $ABC = w°$

Work out the value of w
Give reasons for each stage of your working.

$w =$ .....

(Total for Question 15 is 4 marks)

9 The diagram shows two triangles *ABE* and *ECD*

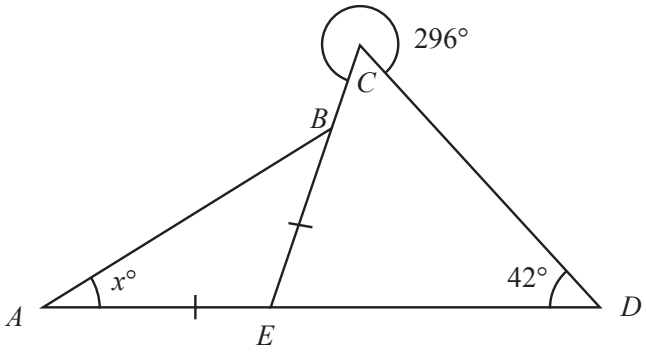


Diagram **NOT** accurately drawn

Triangle *ABE* is isosceles with $AE = EB$
AED and *EBC* are straight lines.

Angle $CDE = 42°$
The reflex angle $ECD = 296°$
Angle $BAE = x°$

Work out the value of x

$x =$ .....

(Total for Question 9 is 4 marks)

8

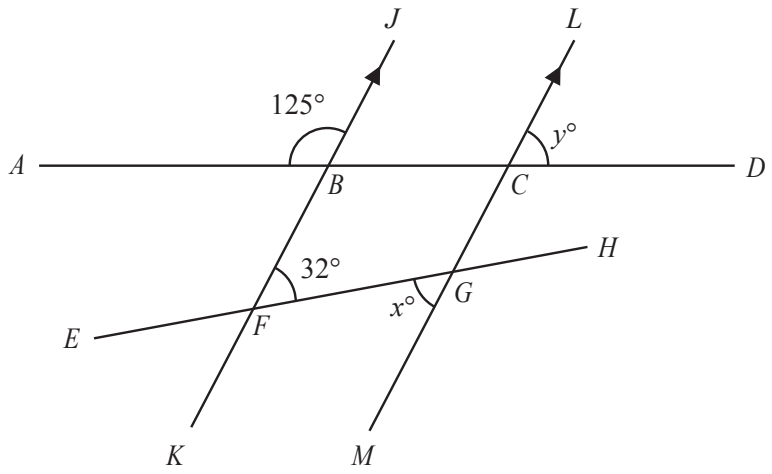


Diagram **NOT** accurately drawn

ABCD and *EFGH* are straight lines.
KFBJ and *MGCL* are parallel straight lines.

angle *ABJ* = 125° angle *BFG* = 32° angle *FGM* = $x°$ angle *LCD* = $y°$

(a) Write down the value of x

$x =$ .....

(1)

(b) (i) Work out the value of y

$y =$ .....

(2)

(ii) Give a reason for your answer to (b) (i)

.....

(1)

(Total for Question 8 is 4 marks)

7

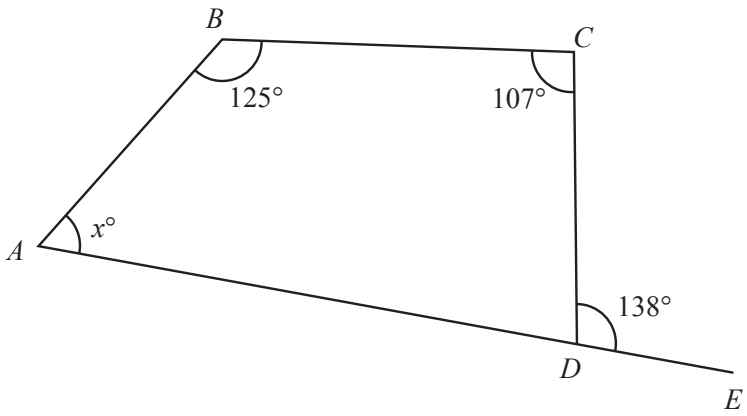


Diagram **NOT** accurately drawn

ABCD is a quadrilateral.

ADE is a straight line.

Work out the value of x
Give a reason for each stage of your working.

$x =$ .....

(Total for Question 7 is 4 marks)

8

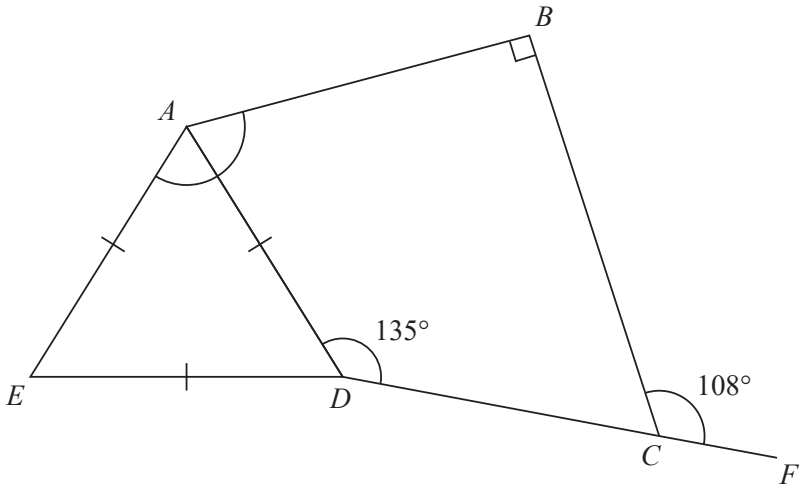


Diagram **NOT** accurately drawn

ABCD is a quadrilateral.
ADE is an equilateral triangle.
DCF is a straight line.

Work out the size of angle *EAB*.
Give a reason for each stage of your working.

.....°

(Total for Question 8 is 5 marks)

13

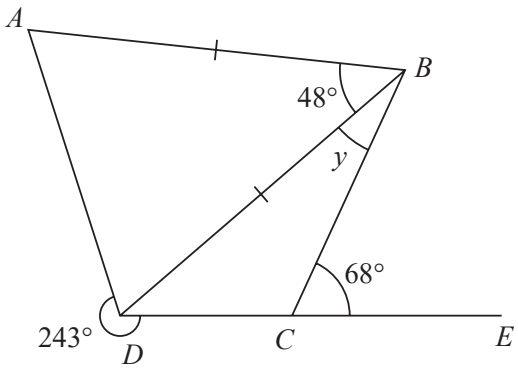


Diagram **NOT** accurately drawn

ABD is an isosceles triangle with $AB = DB$.
DCE is a straight line.

Angle $ABD = 48°$
Angle $BCE = 68°$
Reflex angle $ADC = 243°$

Work out the size of the angle marked y.
Give a reason for each stage in your working.

°

(Total for Question 13 is 5 marks)

8 The diagram shows two triangles, *CDB* and *BDA*.

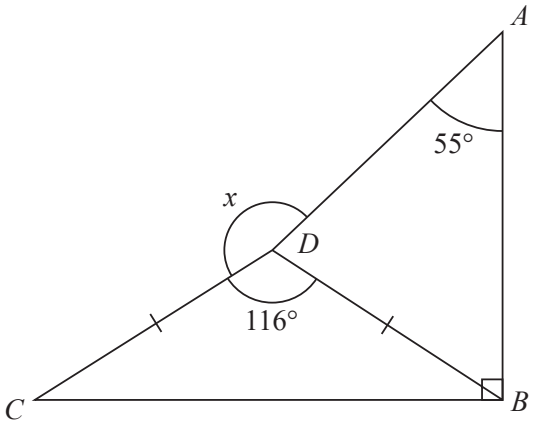


Diagram **NOT** accurately drawn

DC = *DB*
Angle *ABC* = 90°
Angle *CDB* = 116°
Angle *DAB* = 55°

Work out the size of the angle marked *x*.
Give a reason for each stage of your working.

.....°

(Total for Question 8 is 5 marks)

7

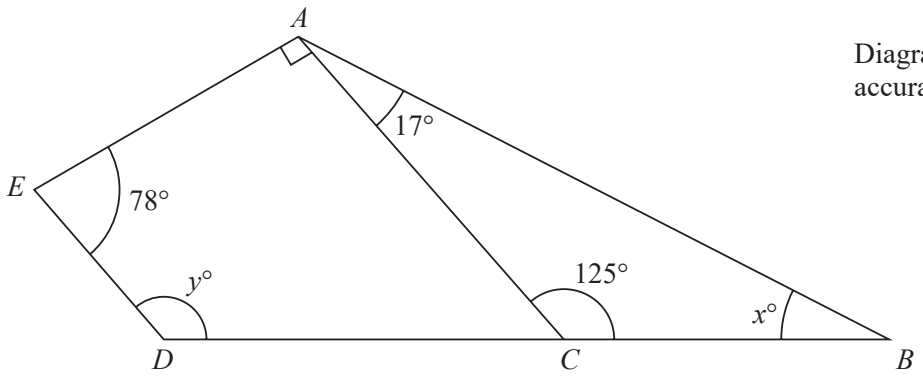


Diagram **NOT** accurately drawn

ABDE is a quadrilateral.
ABC is a triangle.
DCB is a straight line.

(a) (i) Work out the value of x.

$x =$ .....

(1)

(ii) Give a reason for your answer.

.....

(1)

(b) Work out the value of y.
Give a reason for each stage of your working.

$y =$ .....

(3)

(Total for Question 7 is 5 marks)

18

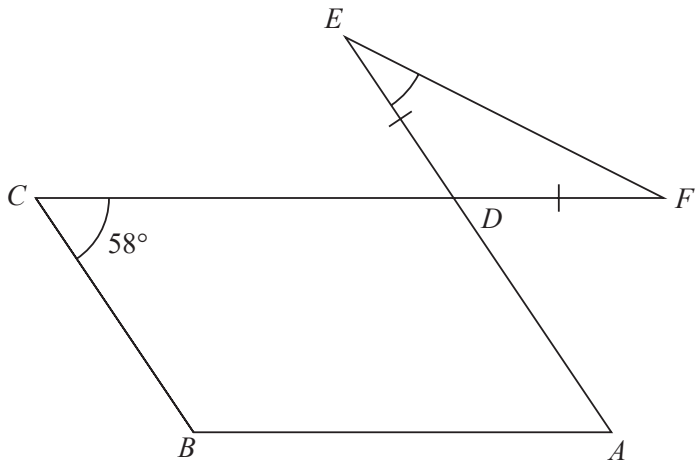


Diagram **NOT** accurately drawn

The diagram shows a parallelogram *ABCD* and an isosceles triangle *DEF* in which *DE* = *DF*

CDF and *ADE* are straight lines.
Angle *BCD* = 58°

Work out the size of angle *DEF*.
Give a reason for each stage of your working.

.....°

(Total for Question 18 is 5 marks)

19

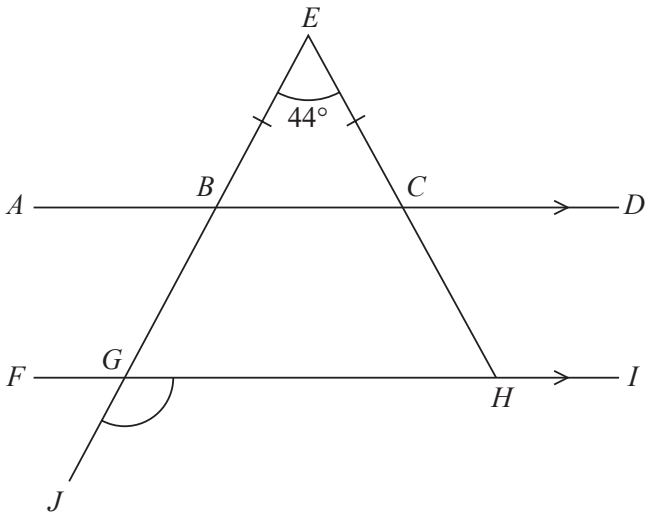


Diagram **NOT** accurately drawn

ABCD and *FGHI* are parallel straight lines.
EBGJ and *ECH* are straight lines.

BE = *CE*
Angle *BEC* = 44°

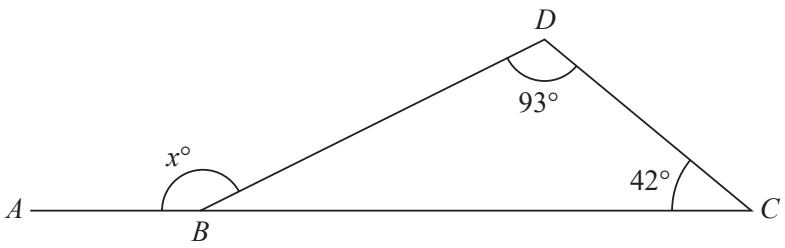
Work out the size of angle *JGH*.
Give a reason for each stage of your working.

.....°

(Total for Question 19 is 5 marks)

8 *ABC* is a straight line and *BCD* is a triangle.

Diagram **NOT** accurately drawn



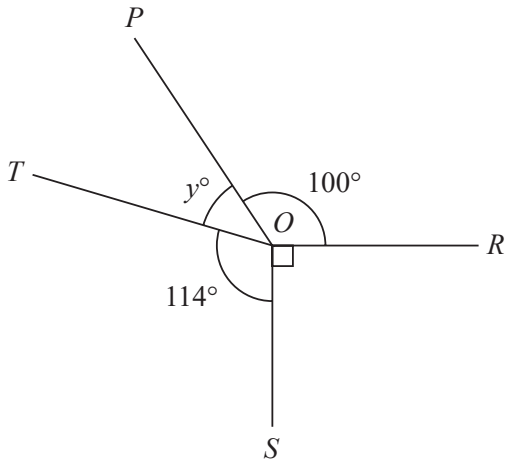
(a) Work out the value of x

$x =$ .....

(2)

PO, *RO*, *SO* and *TO* are four straight lines.

Diagram **NOT** accurately drawn



(b) (i) Work out the value of y

$y =$ .....

(2)

(ii) Give a reason for your answer.

.....

(1)

(Total for Question 8 is 5 marks)

5 Here is a list of numbers.

3 6 7 8 11 25 27

(a) From the numbers in the list, write down

(i) an even number

.....

(1)

(ii) a multiple of 9

.....

(1)

(iii) a square number

.....

(1)

(iv) a prime number

.....

(1)

(b) Use brackets to make the statement correct.
You may use more than one pair of brackets in the statement.

$2^2 + 5 \times 2 + 3^2 = 99$

(1)

(Total for Question 5 is 5 marks)

6

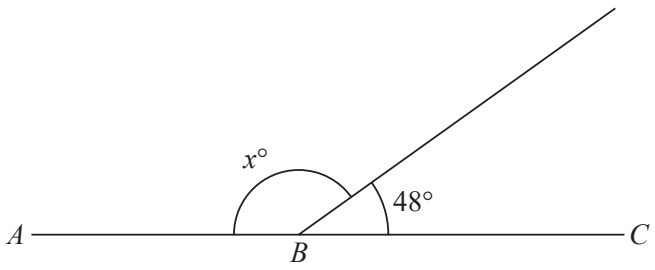


Diagram **NOT** accurately drawn

ABC is a straight line.

(a)(i) Work out the value of x

$x =$ .....

(1)

(ii) Give a reason for your answer to (i)

.....

(1)

Question 6 continued

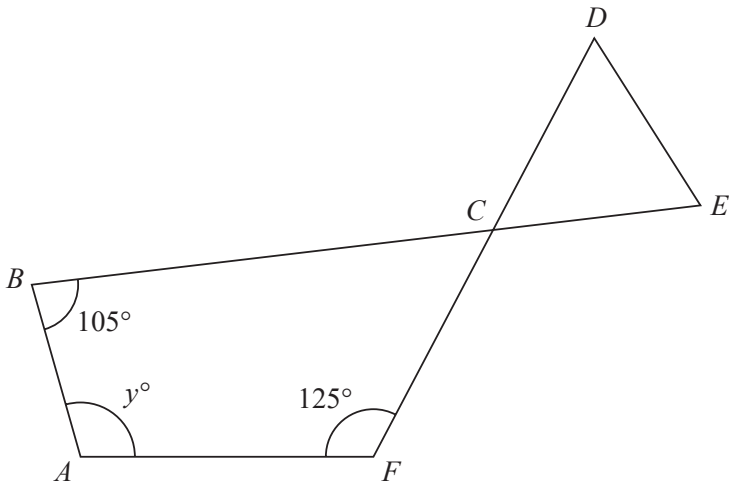


Diagram **NOT** accurately drawn

CDE is an equilateral triangle.
ABCF is a quadrilateral.

BCE and *DCF* are straight lines.

(b) Work out the value of y
You must show your working.

$y =$ .....

(3)

(Total for Question 6 is 5 marks)

10

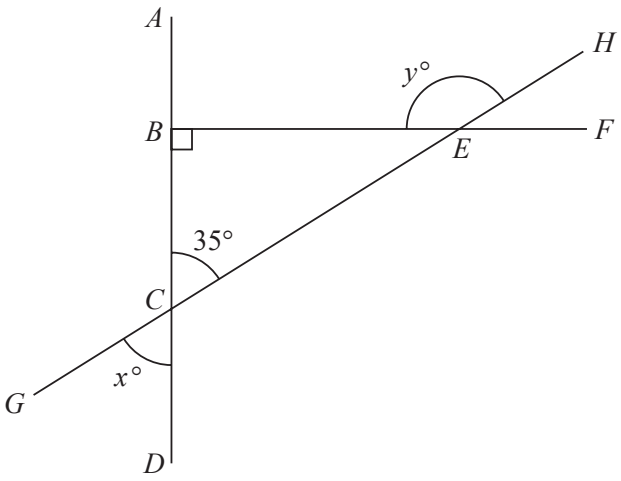


Diagram **NOT** accurately drawn

In the diagram, *BCE* is a right-angled triangle.
ABCD, *BEF* and *GCEH* are straight lines.

Angle *BCE* = 35°

(a) (i) Find the value of x

$x =$ .....

(1)

(ii) Give a reason for your answer.

.....

(1)

(b) (i) Work out the value of y

$y =$ .....

(2)

(ii) Give a reason for your answer.

.....

.....

(1)

(Total for Question 10 is 5 marks)

10 The diagram shows quadrilateral *ABCD*

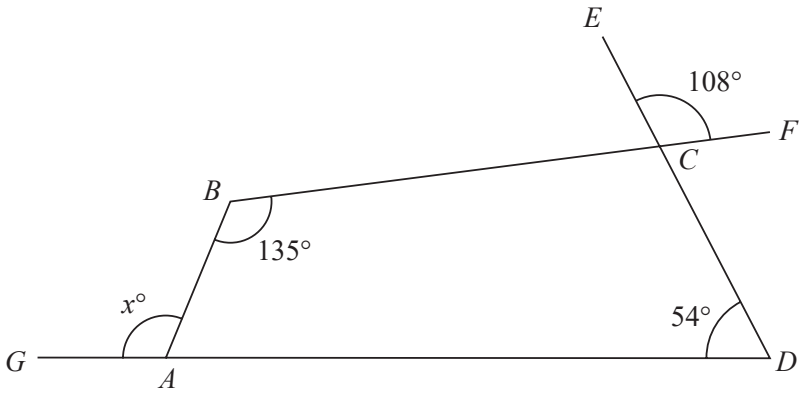


Diagram **NOT** accurately drawn

ECD, *BCF* and *GAD* are straight lines.

Work out the value of x
Give a reason for each stage of your working.

$x =$ .....

(Total for Question 10 is 5 marks)

6

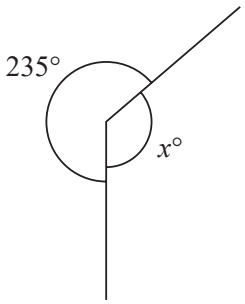


Diagram **NOT** accurately drawn

(a) (i) Work out the value of x

$x =$ .....

(1)

(ii) Give a reason for your answer.

.....

(1)

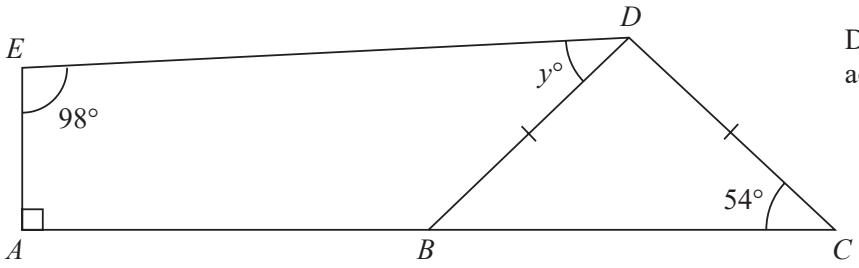


Diagram **NOT** accurately drawn

ABDE is a quadrilateral.
BCD is an isosceles triangle.
ABC is a straight line.

(b) Work out the value of y

$y =$ .....

(3)

(Total for Question 6 is 5 marks)

12

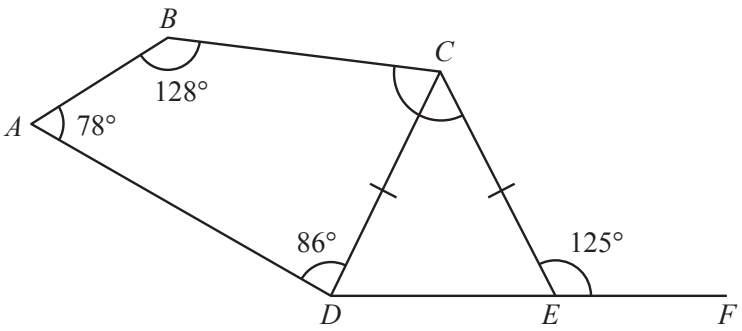


Diagram **NOT** accurately drawn

ABCD is a quadrilateral.
CDE is an isosceles triangle with $CD = CE$
DEF is a straight line.

Work out the size of angle *BCE*
Give a reason for each stage of your working.

angle *BCE* = ... °

(Total for Question 12 is 5 marks)

6 Aabir has some boxes and some crates.
Each box has the same weight.
Each crate has the same weight.

The total weight of 7 boxes and 2 crates is 27.3 kg
The total weight of 4 boxes and 2 crates is 16.8 kg

Work out the weight of one crate.

..... kg

(Total for Question 6 is 4 marks)

7

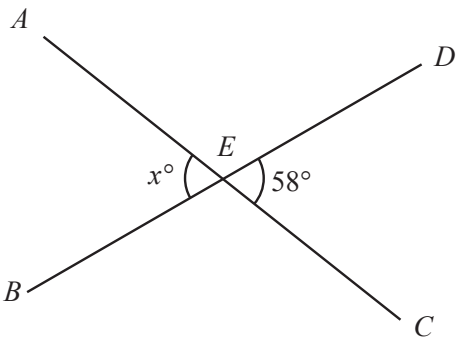


Diagram **NOT** accurately drawn

AEC and *BED* are straight lines.

Sergio says that the value of x is 58

(a) Give a reason why Sergio is correct.

.....

.....

(1)

In the diagram, *GHIJ* is a quadrilateral.

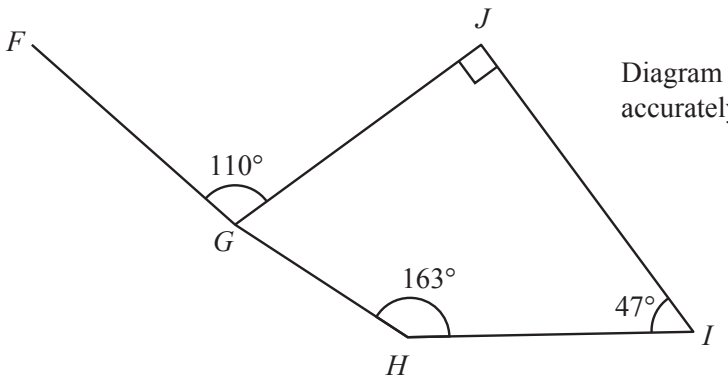


Diagram **NOT** accurately drawn

Chloe says *"FGH* is a straight line"

(b) Show that Chloe is wrong.
Give a reason for each stage of your working.

(4)

(Total for Question 7 is 5 marks)

SUB-TOPIC G1b

POLYGONS & PROPERTIES OF SHAPES

Sub-topic G1b · 59 questions · 219 marks · lowest tariff first

12 (a) Use your calculator to work out the value of

$$\frac{24.3 - 16.8}{0.18} + \sqrt{67.4}$$

Write down all the figures on your calculator display.

.....

(2)

(b) Write your answer to part (a) correct to 1 significant figure.

.....

(1)

(Total for Question 12 is 3 marks)

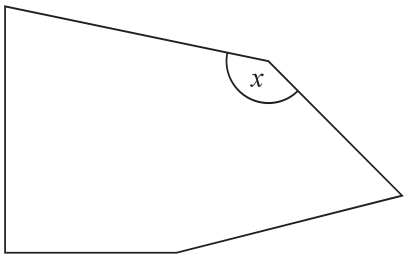
13 Each exterior angle of a regular polygon is 24°

Work out the number of sides of the polygon.

.....

(Total for Question 13 is 2 marks)

3 Here is a pentagon.



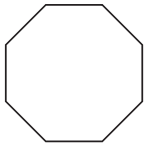
acute	obtuse	reflex	right

(a) Write down the word from the box that describes the angle marked x.

..... angle

(1)

(b) Write down the mathematical name of the following polygon.



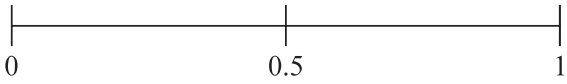
.....

(1)

(Total for Question 3 is 2 marks)

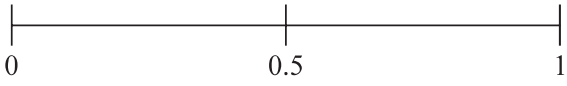
4 Imran throws an ordinary fair dice.

(a) On the probability scale, mark with a cross (×) the probability that the dice will land on 10



(1)

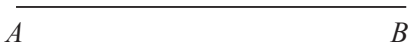
(b) On the probability scale, mark with a cross (×) the probability that the dice will land on an odd number.



(1)

(Total for Question 4 is 2 marks)

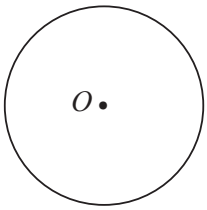
3 The diagram shows a line AB.



(a) At the point A draw an acute angle.
Label your acute angle a.

(1)

The diagram shows a circle with centre O.

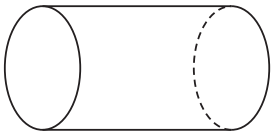


(b) Draw a diameter of the circle.

(1)

(Total for Question 3 is 2 marks)

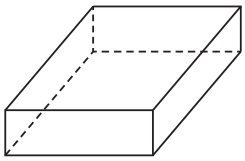
3 (a) Write down the mathematical name of this 3-D shape.



.....

(1)

Here is a solid prism.



(b) How many edges has the prism?

.....

(1)

(Total for Question 3 is 2 marks)

4 Here are the salaries, in thousands of dollars, of seven people.

21 28 29 32 34 34 39

(a) Find the mode of the salaries.

..... thousand dollars

(1)

(b) Find the range of the salaries.

..... thousand dollars

(1)

(Total for Question 4 is 2 marks)

12 The size of each exterior angle of a regular polygon is 15°

Work out the number of sides of the regular polygon.

.....

(Total for Question 12 is 2 marks)

(c) Write down the ratio of the total number of medals won by Russia to the total number of medals won by Germany.
Give your ratio in its simplest form.

.....

(2)

The USA won
46 gold medals
37 silver medals
38 bronze medals

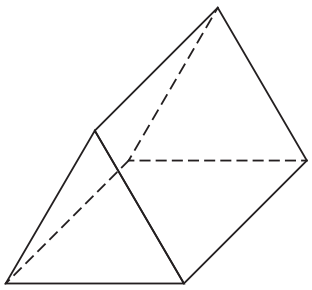
(d) What fraction of the total number of medals won by the USA were gold medals?

.....

(2)

(Total for Question 2 is 7 marks)

3 (i) Write down the mathematical name of this 3-D shape.



.....

(ii) How many faces does the shape have?

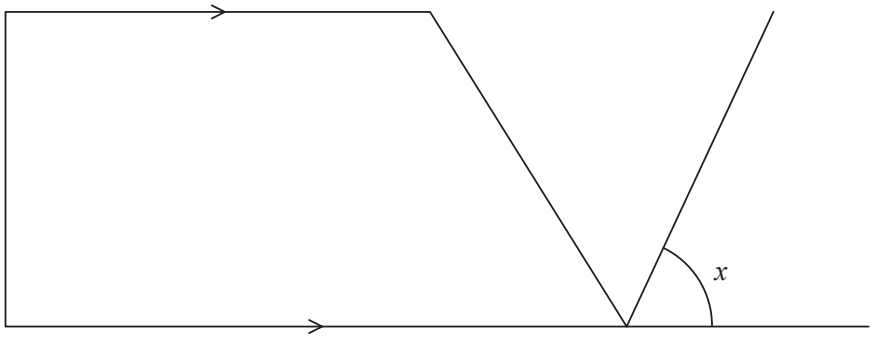
.....

(iii) How many vertices does the shape have?

.....

(Total for Question 3 is 3 marks)

4



(a) On the diagram, mark a right angle with the letter *R*.

(1)

There is a quadrilateral in the diagram.

(b) Write down the mathematical name of this quadrilateral.

.....

(1)

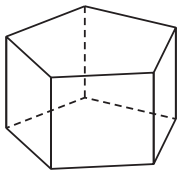
(c) Measure the size of angle *x*.

..... °

(1)

(Total for Question 4 is 3 marks)

7 The diagram shows a 3-D shape.



(a) Write down the mathematical name of the shape.

.....

(1)

(b) How many faces has the shape?

.....

(1)

(c) How many edges has the shape?

.....

(1)

(Total for Question 7 is 3 marks)

8 Giovanni arrived at a railway station in Venice at 0645

(a) Write this time using the 12-hour clock.

.....

(1)

Giovanni caught a train from Venice to Rome.
The train left Venice at 0725 and arrived in Rome at 1110 the same day.

(b) Work out how long the train journey took.
Give your answer in hours and minutes.

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

(2)

(Total for Question 8 is 3 marks)

Answer ALL TWENTY THREE questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1

3	8	16	19	24	51	60	81

From the numbers in the box, write down

(a) an odd number

.....

(1)

(b) a multiple of 12

.....

(1)

(c) a square number

.....

(1)

(d) a prime number

.....

(1)

(Total for Question 1 is 4 marks)

2 Complete the following statements by writing a number on each dotted line.

(a) A pentagon has ..... sides.

(1)

(b) The size of each angle in an equilateral triangle is ..... °

(1)

(c) 1 kilometre = ... metres.

(1)

(Total for Question 2 is 3 marks)

16 Each interior angle of a regular polygon is 162°

Work out the number of sides the polygon has.

.....

(Total for Question 16 is 3 marks)

15 A regular polygon has n sides.
The size of each interior angle of the regular polygon is 140°

Work out the value of n.

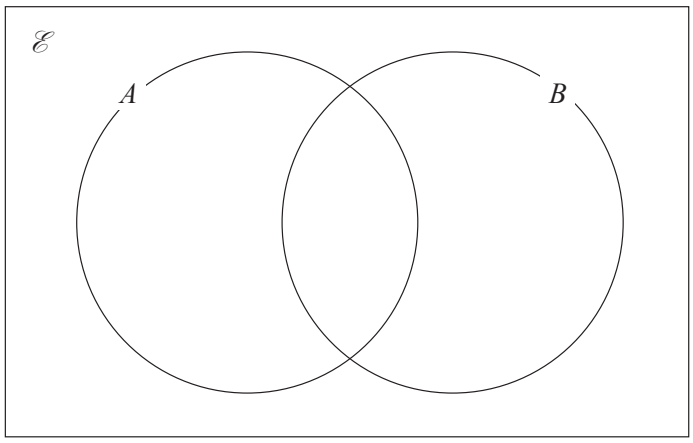
$n =$ .....

(Total for Question 15 is 3 marks)

16 $\mathscr{E} = \{10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20\}$

$A = \{\text{multiples of } 5\}$
$B = \{\text{even numbers}\}$

Complete the Venn diagram for this information.



(Total for Question 16 is 3 marks)

26 The diagram shows two congruent isosceles triangles and parts of two congruent regular polygons, **X** and **Y**.

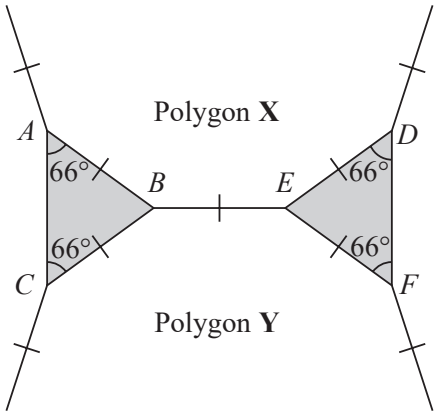


Diagram **NOT** accurately drawn

The two regular polygons each have n sides.

Work out the value of n.

$n =$ .....

(Total for Question 26 is 3 marks)

TOTAL FOR PAPER IS 100 MARKS

27 The diagram shows a regular octagon *ABCDEFGH*.

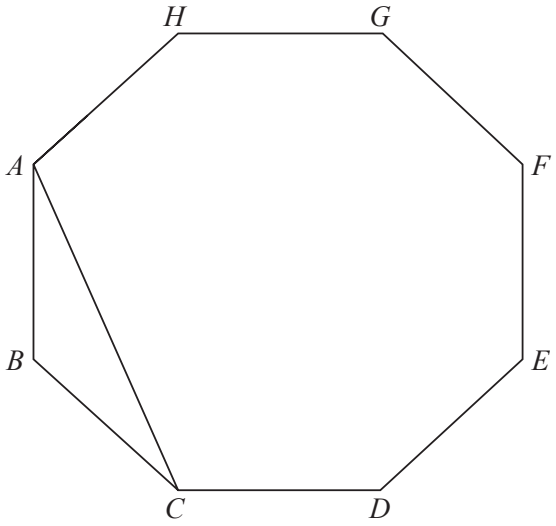


Diagram **NOT** accurately drawn

Work out the size of angle *HAC*.

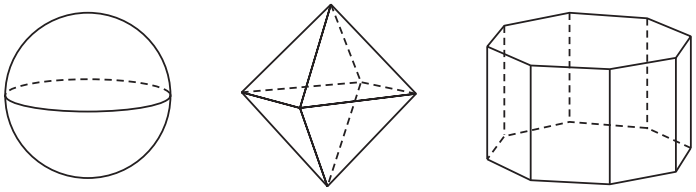
.....°

(Total for Question 27 is 3 marks)

TOTAL FOR PAPER IS 100 MARKS

2 The diagram shows some 3-D shapes.

Shape A **Shape B** **Shape C**



(a) What is the mathematical name of shape **A**?

.....

(1)

(b) How many edges has shape **B**?

.....

(1)

(c) How many faces has shape **C**?

.....

(1)

(Total for Question 2 is 3 marks)

3 Here are the first five terms of a number sequence.

1 3 9 27 81

(a) Find the next term of this sequence.

.....

(1)

(b) Explain how you found this term.

.....

.....

(1)

The 9th term of this number sequence is 6561

(c) Find the 10th term of this sequence.

.....

(1)

(Total for Question 3 is 3 marks)

11 The diagram shows a square *ABCD* and a regular pentagon *CDEFG*.

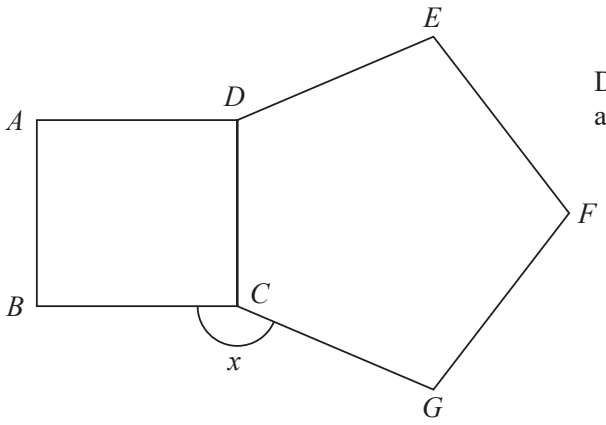


Diagram **NOT** accurately drawn

Work out the size of the angle marked *x*.

.....°

(Total for Question 11 is 3 marks)

8 Here is a rhombus.

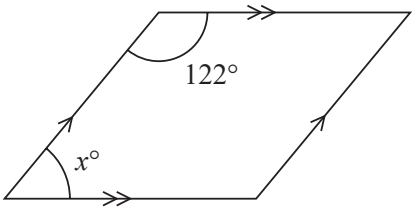


Diagram **NOT** accurately drawn

Work out the value of x.
Give a reason for your answer.

$x =$ .....

(Total for Question 8 is 3 marks)

9 The diagram shows a cuboid.

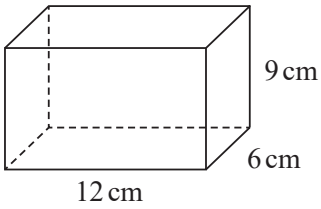


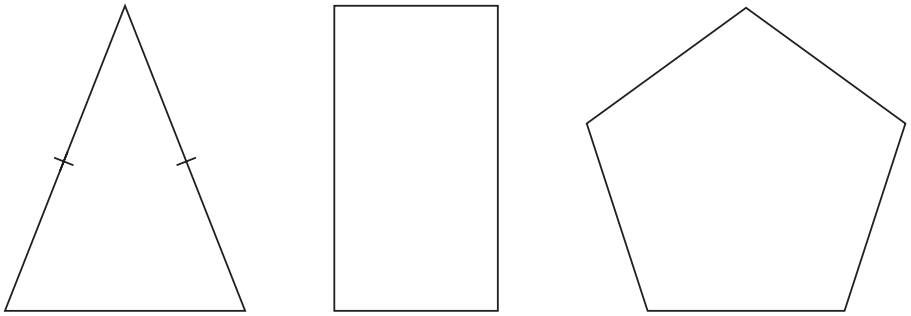
Diagram **NOT** accurately drawn

Work out the volume of the cuboid.

..... cm^3

(Total for Question 9 is 2 marks)

2 Here are three shapes.



A **B** **C**

Shape **A** is a triangle.

(a) Write down the mathematical name for this type of triangle.

.....

(1)

Shape **B** is a rectangle.

(b) On shape **B**, draw its lines of symmetry.

(1)

Shape **C** is a regular polygon.

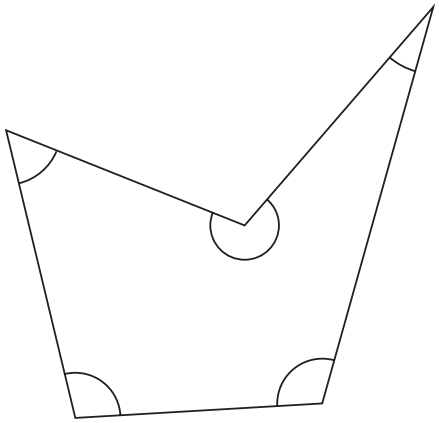
(c) Write down the order of rotational symmetry of shape **C**.

.....

(1)

(Total for Question 2 is 3 marks)

2 Here is a 5-sided polygon.



(a) Write down the mathematical name for a 5-sided polygon.

.....

(1)

(b) On the diagram, mark with a letter *A* an acute angle.

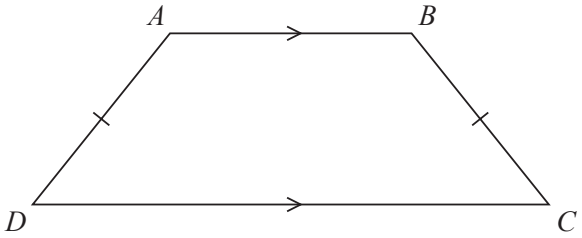
(1)

(c) On the diagram, mark with a letter *R* a reflex angle.

(1)

(Total for Question 2 is 3 marks)

5 The diagram shows the trapezium $ABCD$

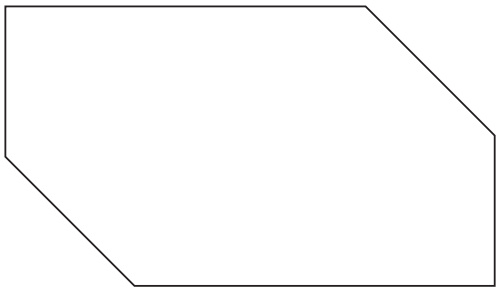


(a) How many lines of symmetry has $ABCD$?

.....

(1)

Here is another shape.

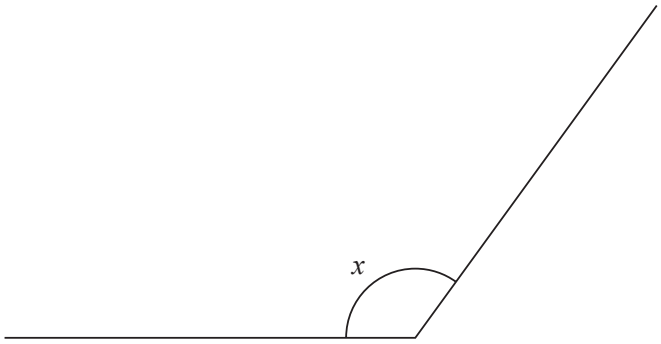


(b) Write down the order of rotational symmetry of this shape.

.....

(1)

(c) Find, by measuring, the size of the angle marked x

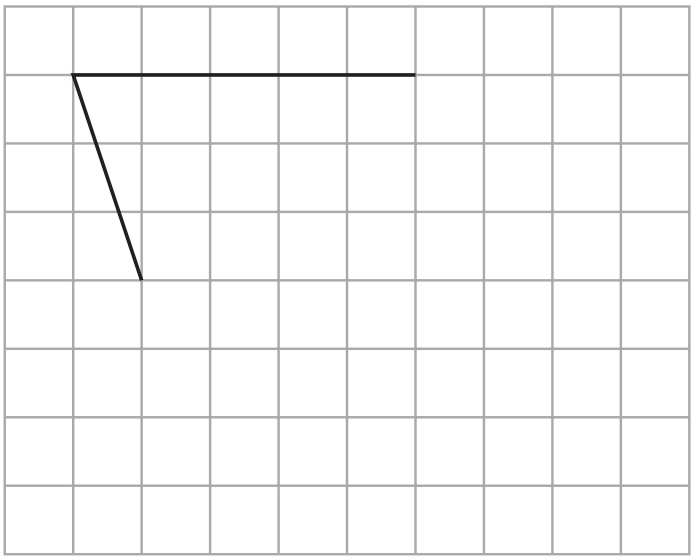


.....°

(1)

(Total for Question 5 is 3 marks)

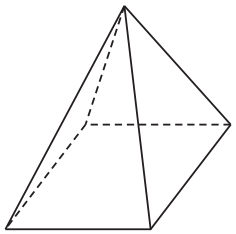
4 Here are two sides of a parallelogram.



(a) On the grid above, complete the parallelogram.

(1)

The diagram shows a 3-D shape.



(b) (i) What is the mathematical name of this 3-D shape?

.....

(1)

(ii) How many faces has this shape?

.....

(1)

(Total for Question 4 is 3 marks)

19 The diagram shows a pentagon.

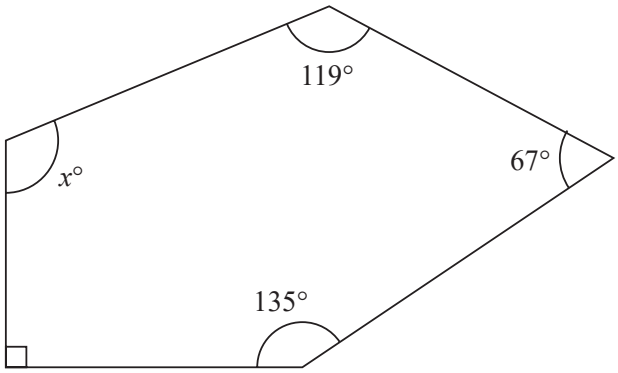


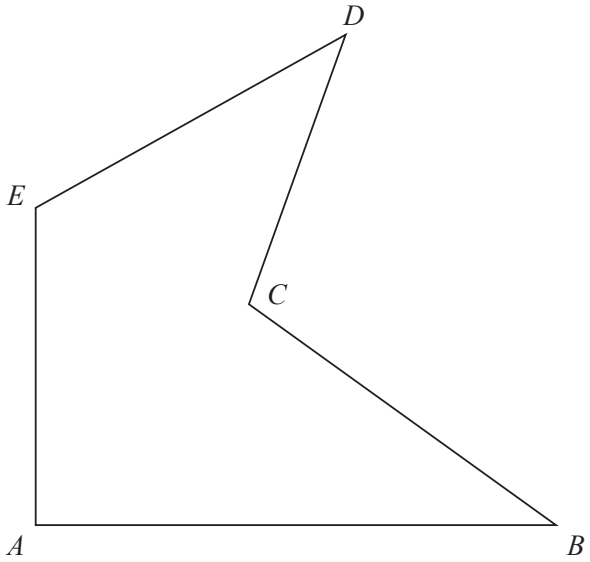
Diagram **NOT** accurately drawn

Work out the value of x

$x =$ .....

(Total for Question 19 is 3 marks)

3 The diagram shows a 5-sided polygon, *ABCDE*



(a) Write down the mathematical name for a 5-sided polygon.

.....

(1)

(b) Measure the length of the line *AB*
Give your answer in centimetres.

..... cm

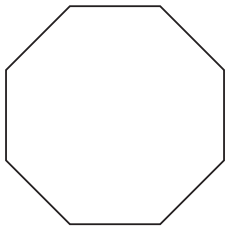
(1)

(c) On the diagram, mark an obtuse angle with the letter *T*

(1)

(Total for Question 3 is 3 marks)

6 (a) Write down the mathematical name of this polygon.



.....

(1)

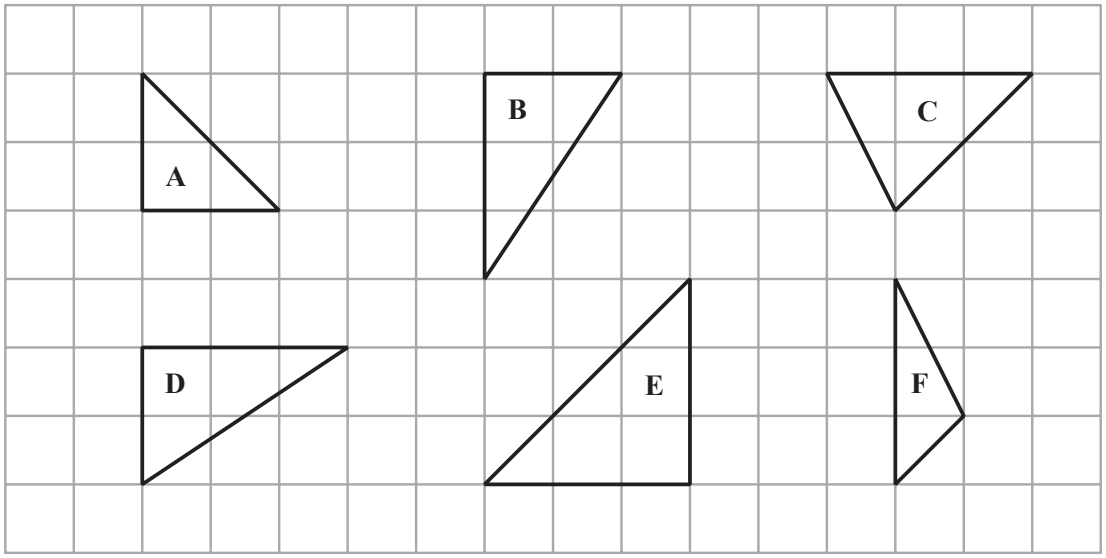
(b) Measure the length of the line AB
Give your answer in centimetres.



..... cm

(1)

Here are six triangles drawn on a grid of squares.



Two of these triangles are congruent.

(c) Write down the letters of these two triangles.

..... and .....

(1)

(Total for Question 6 is 3 marks)

27 Here is a 9-sided regular polygon *ABCDEFGHJ*, with centre *O*

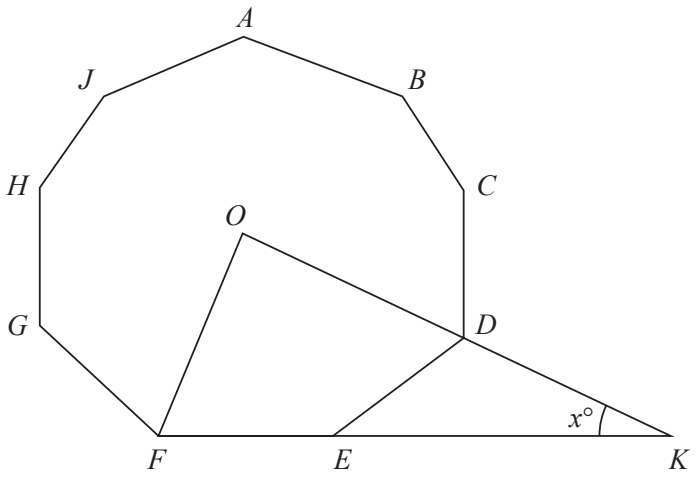


Diagram **NOT** accurately drawn

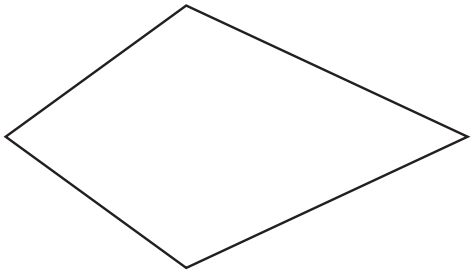
ODK and *FEK* are straight lines.

Work out the value of *x*

x = ...

(Total for Question 27 is 3 marks)

4 Here is a quadrilateral.

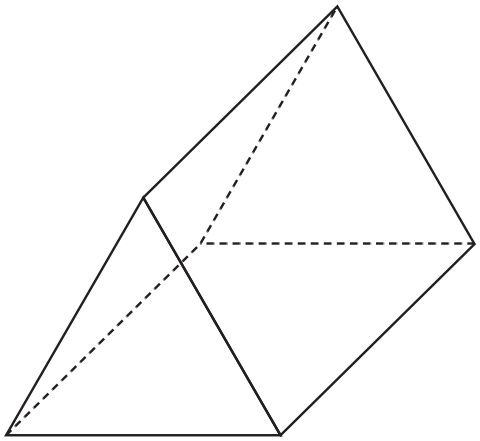


(a) What is the mathematical name for this type of quadrilateral?

.....

(1)

The diagram shows a 3-D shape.



(b) (i) What is the mathematical name for this 3-D shape?

.....

(1)

(ii) How many edges has this shape?

.....

(1)

(Total for Question 4 is 3 marks)

24

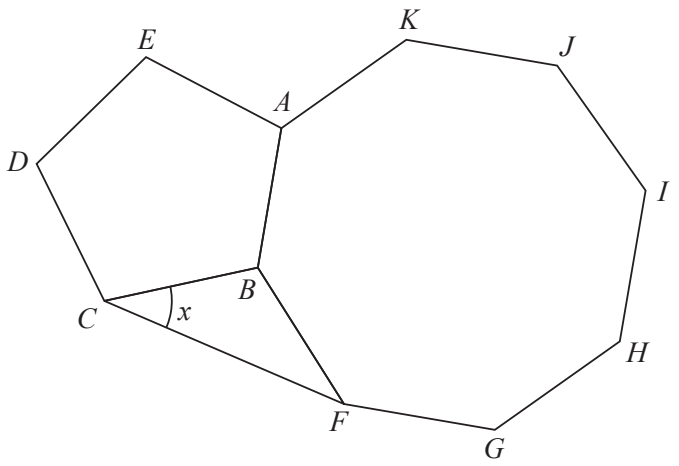


Diagram **NOT** accurately drawn

The diagram shows a regular pentagon, *ABCDE*, a regular octagon, *ABFGHIJK*, and an isosceles triangle, *BCF*.

Work out the size of angle *x*.

.....°

(Total for Question 24 is 4 marks)

23

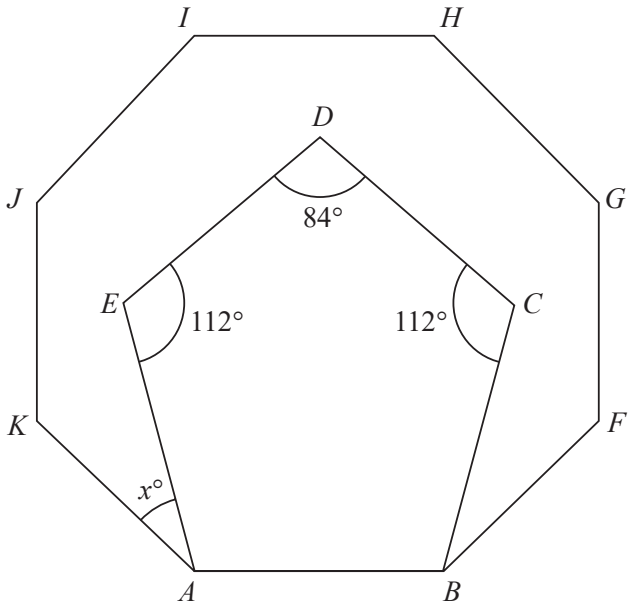


Diagram **NOT** accurately drawn

Pentagon *ABCDE* is drawn inside the regular octagon *ABFGHIJK*.
The pentagon has exactly one line of symmetry.

Work out the value of *x*.

x =

(Total for Question 23 is 4 marks)

4 Here are five road signs.



A



B



C



D



E

One of these five road signs has one line of symmetry.

(a) Write down the letter of this road sign.

.....

(1)

One of these five road signs has an order of rotational symmetry greater than 1

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

.....

(ii) Write down the order of rotational symmetry of this road sign.

.....

(2)

Road sign **E** is in the shape of a polygon with 8 sides.

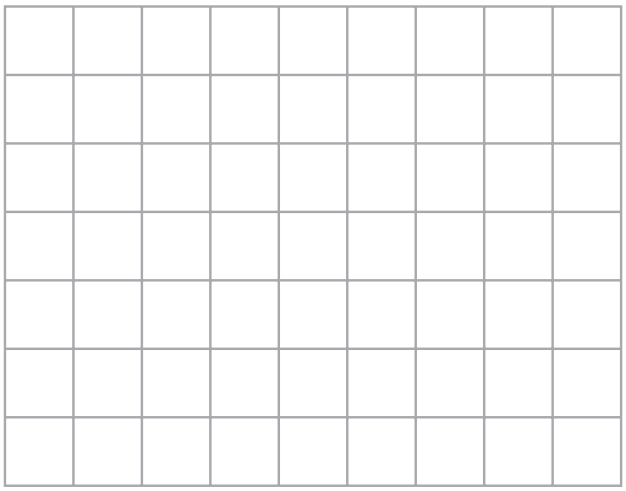
(c) Write down the name of a polygon with 8 sides.

.....

(1)

(Total for Question 4 is 4 marks)

3 (a) On the grid below, draw a kite.



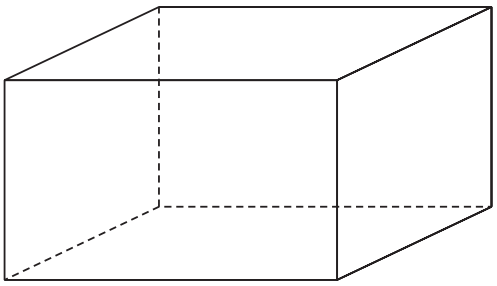
(1)

(b) Write down the mathematical name of an 8-sided polygon.

.....

(1)

Here is a solid prism.



(c) (i) Write down the mathematical name of this prism.

.....

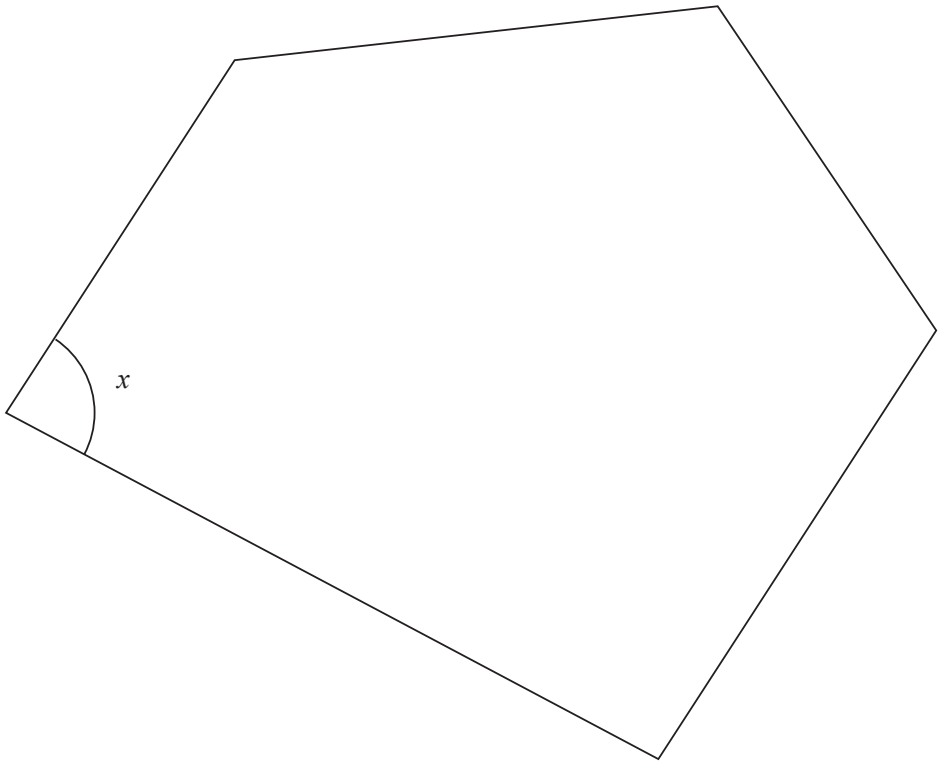
(ii) How many vertices does the prism have?

.....

(2)

(Total for Question 3 is 4 marks)

4 Here is a polygon with five sides.



(a) Write down the mathematical name of a polygon with five sides.

.....

(1)

(b) Measure the size of the angle marked x.

.....°

(1)

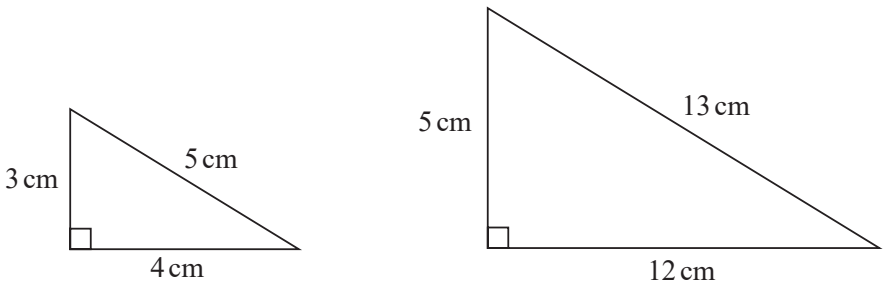
Two sides of the polygon are parallel.

(c) On the polygon, mark with arrows (>>) this pair of parallel lines.

(1)

Here are two triangles.

Diagram **NOT** accurately drawn



Triangle **A** Triangle **B**

(d) Are triangle **A** and triangle **B** similar triangles?
You must give a reason for your answer.

.....

.....

.....

(1)

(Total for Question 4 is 4 marks)

5 Matt buys a notebook and some pencils.

The notebook costs $2.35
Each pencil costs $0.74

Matt has a total of $20 to spend on the notebook and the pencils.
He buys the greatest number of pencils that he can.

Work out how many pencils he buys.

.....

(Total for Question 5 is 3 marks)

21 Here is a 10-sided polygon.

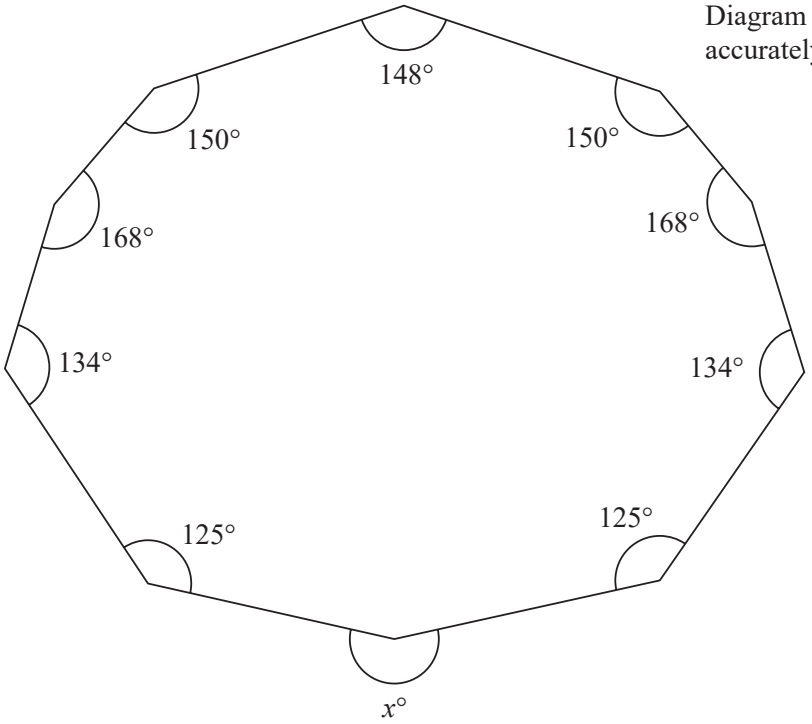


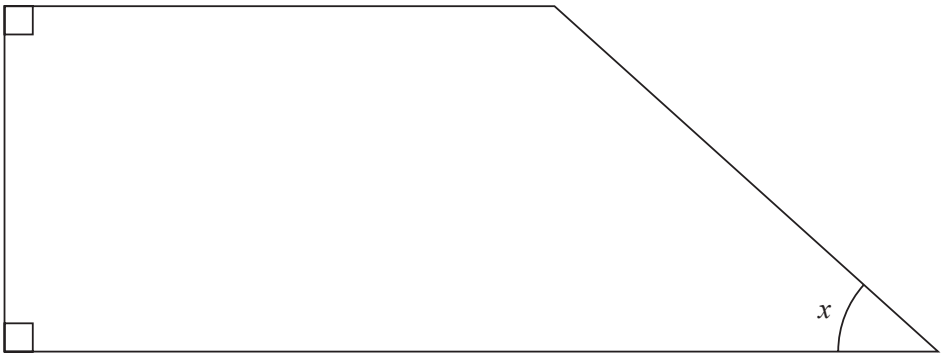
Diagram **NOT** accurately drawn

Work out the value of x.

$x =$ .....

(Total for Question 21 is 4 marks)

3 Here is a quadrilateral.



(a) What is the mathematical name of this quadrilateral?

.....

(1)

(b) Measure the size of the angle marked x.

..... °

(1)

(c) On the quadrilateral, mark with arrows (>>) a pair of parallel lines.

(1)

The quadrilateral has four angles.

(d) How many of these angles are right angles?

.....

(1)

(Total for Question 3 is 4 marks)

26 The diagram shows a regular 10-sided polygon, *ABCDEFGHIJ*

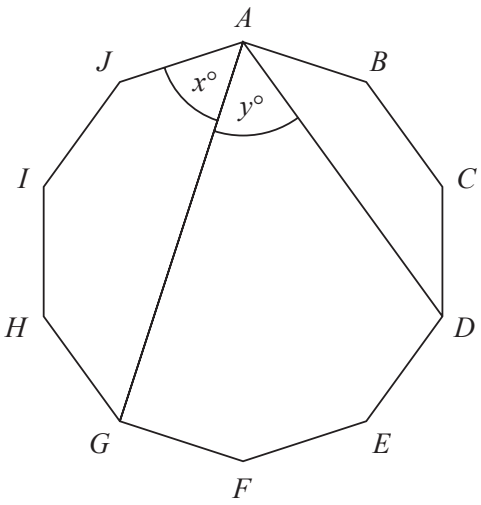


Diagram **NOT** accurately drawn

Show that $x = y$

(Total for Question 26 is 4 marks)

TOTAL FOR PAPER IS 100 MARKS

9 Here is a quadrilateral.

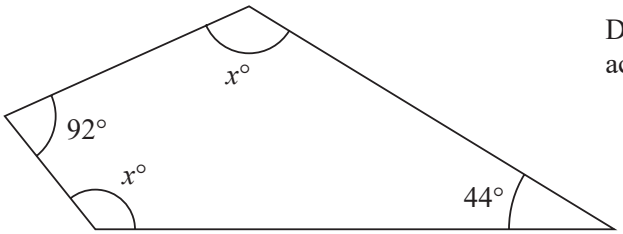


Diagram **NOT** accurately drawn

(i) Work out the value of x

$x =$ .....

(3)

(ii) Give a reason for your answer.

.....

(1)

(Total for Question 9 is 4 marks)

21 The diagram shows a regular octagon *ABCDEFGH* and a regular pentagon *ABIJK*

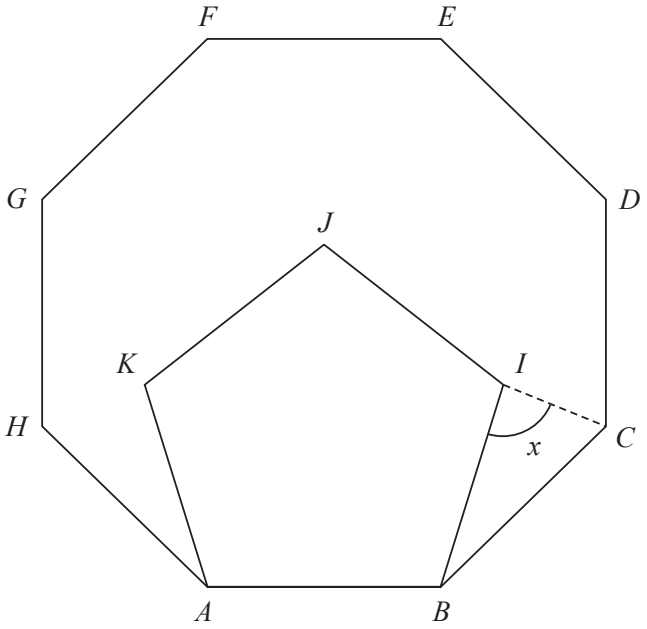


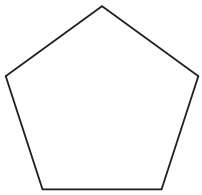
Diagram **NOT** accurately drawn

Work out the size of the angle *x*

.....°

(Total for Question 21 is 4 marks)

4 Here is a polygon.

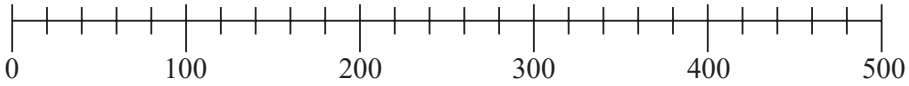


(a) Write down the mathematical name of this polygon.

.....

(1)

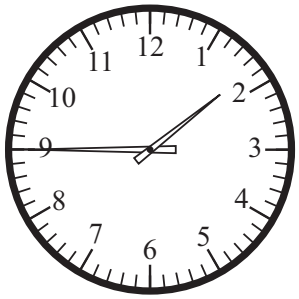
Here is a scale.



(b) On the scale, mark with an arrow (↑) the number 360

(1)

Here is a clock face.



(c) Write down the time shown on the clock face.

.....

(1)

(d) Complete the following sentence by writing a suitable metric unit on the dotted line.

The length of a pen is 16 .....

(1)

(Total for Question 4 is 4 marks)

19 The diagram shows parts of three regular polygons, **A**, **B** and **C**, meeting at a point.

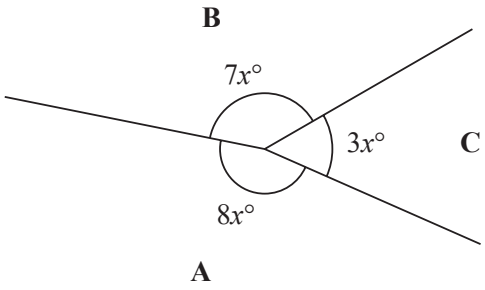


Diagram **NOT** accurately drawn

Polygon **B** has n sides.

Work out the value of n.

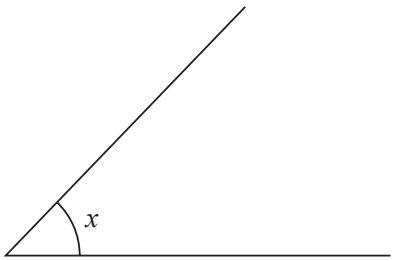
$n =$ .....

(Total for Question 19 is 4 marks)

3 (a) Write down the mathematical name for an 8-sided polygon.

.....

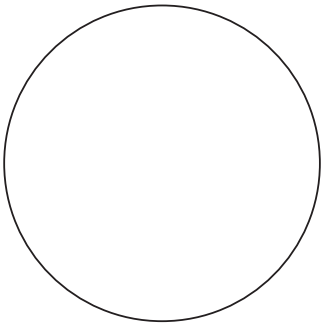
(1)



(b) What type of angle is the angle marked x?

.....

(1)



(c) On the diagram above, draw a chord of the circle.

(1)

(d) Change 3.6 metres into centimetres.

..... cm

(1)

(Total for Question 3 is 4 marks)

25

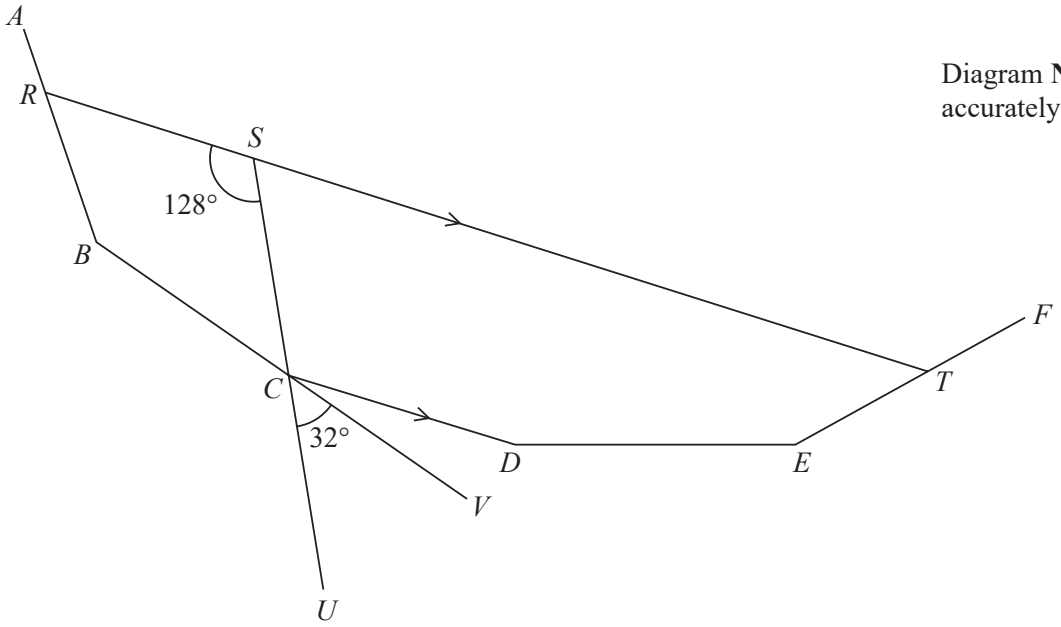


Diagram **NOT** accurately drawn

AB, *BC*, *CD*, *DE* and *EF* are five sides of a regular polygon.

RST, *SCU* and *BCV* are straight lines.
RST is parallel to *CD*
Angle *RSC* = 128°
Angle *UCV* = 32°

Work out how many sides the polygon has.
Show your working clearly.

.....

(Total for Question 25 is 4 marks)

TOTAL FOR PAPER IS 100 MARKS

19 *ABCD* is a trapezium.

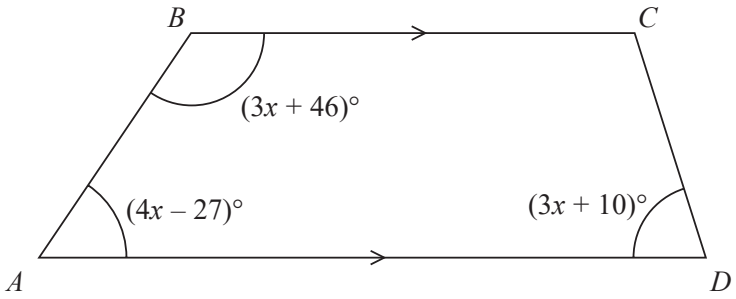


Diagram **NOT** accurately drawn

BC is parallel to *AD*

Find the size of the largest angle inside the trapezium.

.....°

(Total for Question 19 is 4 marks)

Answer ALL TWENTY FIVE questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1

20	21	23	25	27	29

From the numbers in the box, write down

(a) (i) the even number,

.....

(1)

(ii) the square number.

.....

(1)

prime	square	cube	factor	product

(b) Complete the following statements by writing a suitable word from the box on each of the dotted lines.

(i) 343 is the ..... of 7

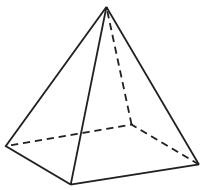
(1)

(ii) 9 is a ..... of 63

(1)

(Total for Question 1 is 4 marks)

2 Here is a solid shape.

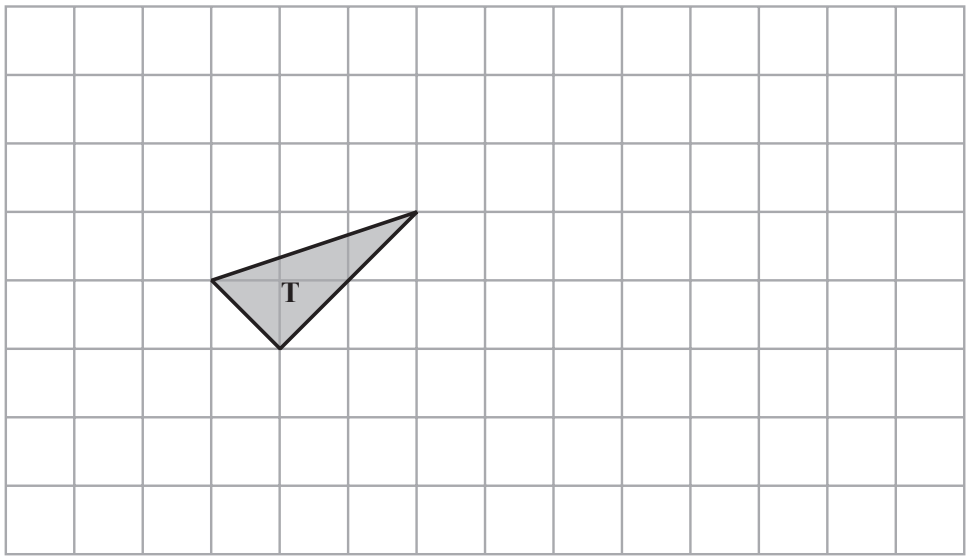


(a) Write down the number of edges of this shape.

.....

(1)

(b) On the grid below, draw a shape that is congruent to shape **T**



(1)

Here is a parallelogram.

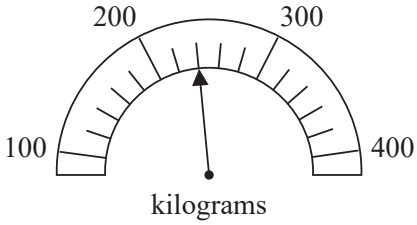


(c) Write down the order of rotational symmetry of the parallelogram.

.....

(1)

Here is a scale.



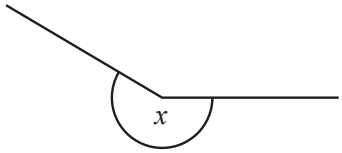
(d) Write down the weight marked by the arrow.

..... kilograms

(1)

(Total for Question 2 is 4 marks)

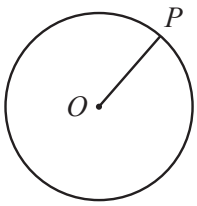
3 (a)



Write down the mathematical name of the angle marked x

.....

(1)



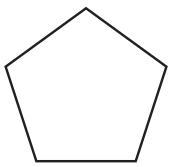
P is a point on a circle with centre O

(b) Write down the mathematical name of the line OP

.....

(1)

Here is a polygon.

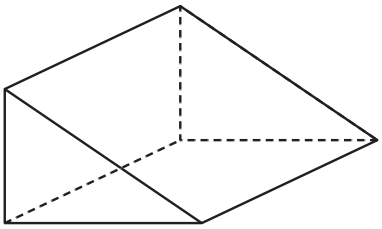


(c) Write down the mathematical name of this polygon.

.....

(1)

Here is a solid prism.



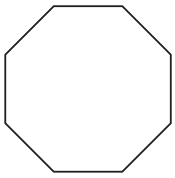
(d) Write down the number of edges of this solid prism.

.....

(1)

(Total for Question 3 is 4 marks)

4 Here is a polygon.

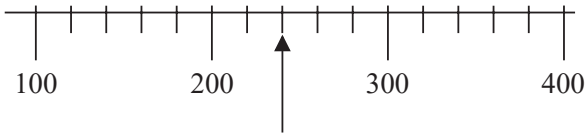


(a) Write down the mathematical name of this polygon.

.....

(1)

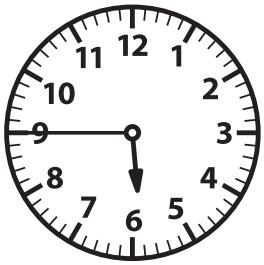
(b) Write down the number marked with the arrow.



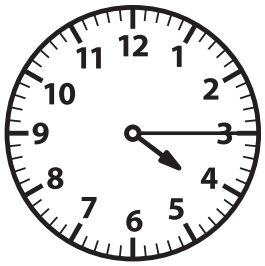
.....

(1)

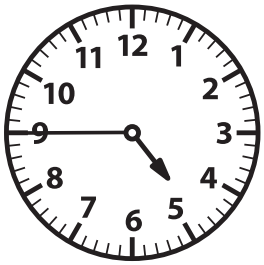
Here are four clock faces.



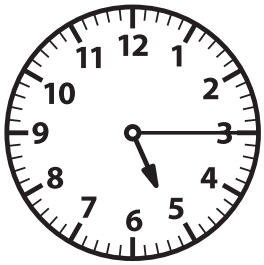
A



B



C



D

(c) Write down the letter of the clock face that shows quarter to five.

.....

(1)

(d) Complete the following sentence by writing a suitable metric unit on the dotted line.

The height of the Eiffel Tower is 300 .....

(1)

(Total for Question 4 is 4 marks)

20 In the diagram, *ABCDE* is a regular pentagon.

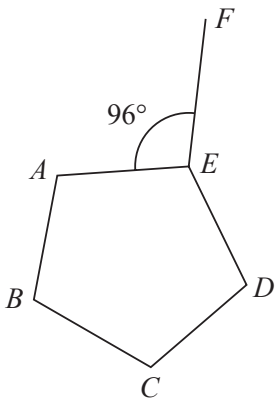


Diagram **NOT** accurately drawn

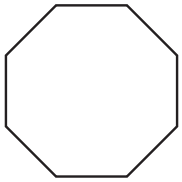
Angle *AEF* = 96°

Work out the size of the obtuse angle *FED*
Show your working clearly.

.....°

(Total for Question 20 is 4 marks)

6 The diagram shows a regular octagon.

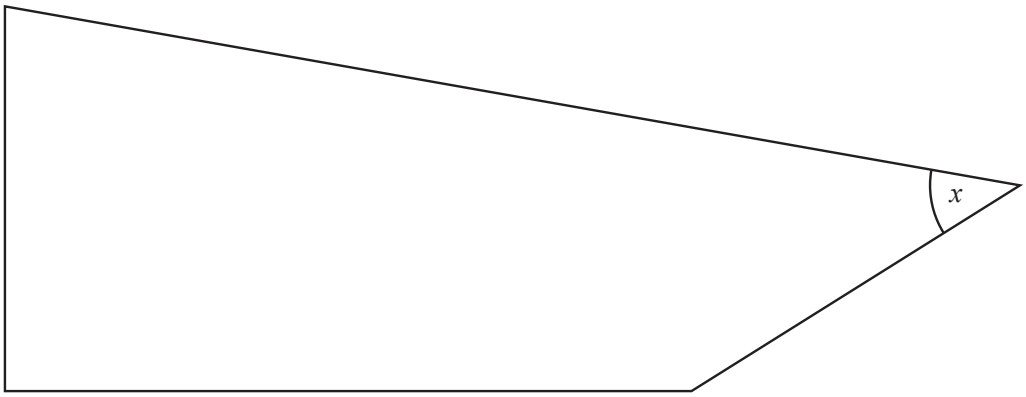


(a) Write down the number of lines of symmetry of a regular octagon.

.....

(1)

Here is a shape.



(b) On the shape, mark with a letter *R* a right angle.

(1)

(c) On the shape, mark with a letter *O* an obtuse angle.

(1)

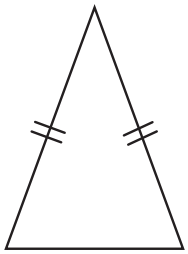
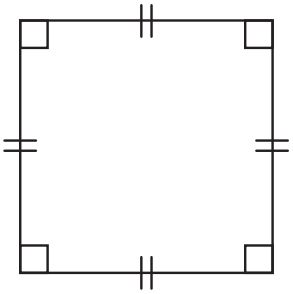
(d) Find, by measuring, the size of the angle marked *x*

..... °

(1)

(Total for Question 6 is 4 marks)

2 Here are two shapes.

Triangle	Quadrilateral
	

(a) Write down the mathematical name of the

(i) triangle,

.....

(1)

(ii) quadrilateral.

.....

(1)

(b) On the triangle, draw the line of symmetry.

(1)

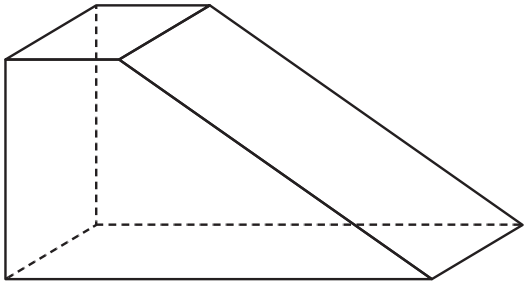
(c) Write down the order of rotational symmetry of the quadrilateral.

.....

(1)

(Total for Question 2 is 4 marks)

3 Here is a prism.



(a) How many faces has the prism?

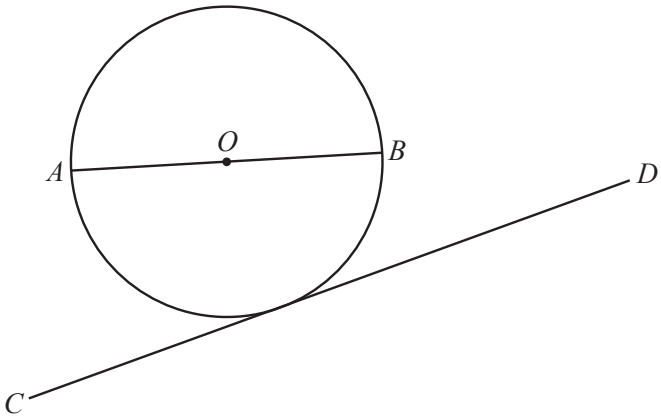
.....

(1)

(b) How many vertices has the prism?

.....

(1)



A and B are points on a circle, centre O

(c) Write down the mathematical name of the line AB

.....

(1)

(d) Write down the mathematical name of the line CD

.....

(1)

(Total for Question 3 is 4 marks)

20

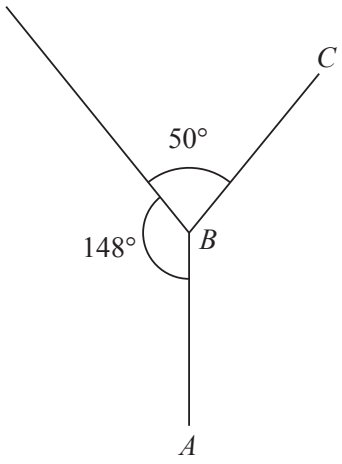


Diagram **NOT** accurately drawn

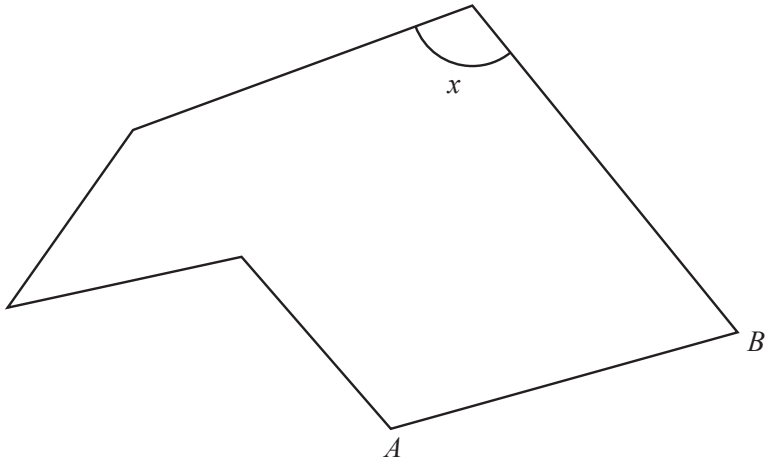
AB and *BC* are two sides of a regular polygon with *n* sides.

Work out the value of *n*
Show your working clearly.

n = ...

(Total for Question 20 is 4 marks)

3 The diagram shows a 6-sided polygon.



(a) Measure the length of the side AB
Give the units of your answer.

....

(2)

(b) Measure the size of the angle marked x

..... °

(1)

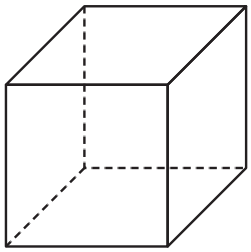
(c) Write down the mathematical name of a 6-sided polygon.

.....

(1)

(Total for Question 3 is 4 marks)

3 Here is a 3-D shape.



(a) (i) Write down the mathematical name of this shape.

.....

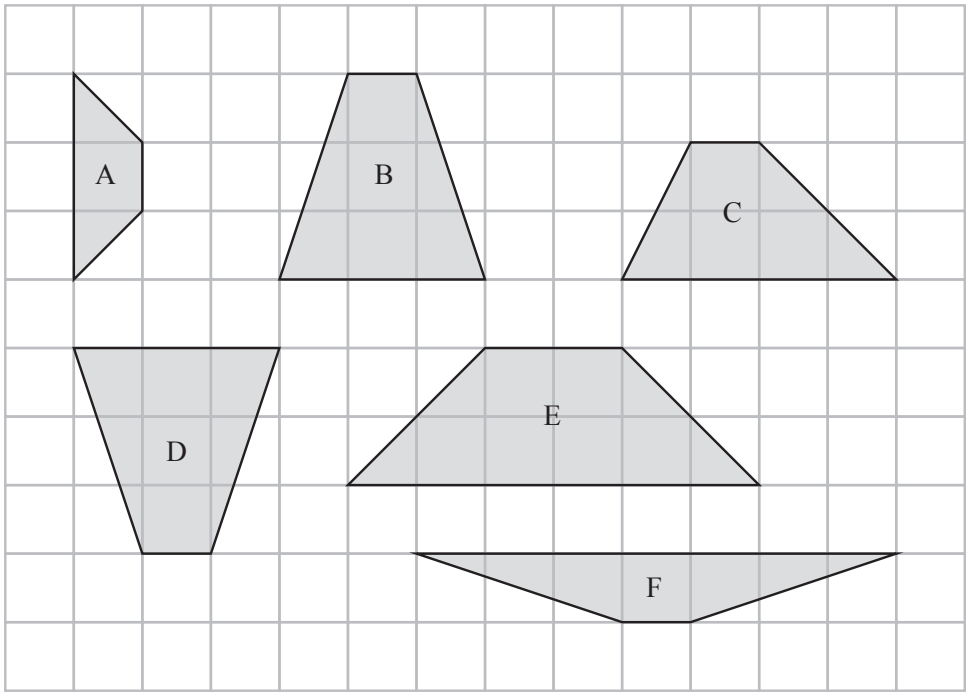
(1)

(ii) Write down the number of edges of this shape.

.....

(1)

Here are six quadrilaterals on a grid.



Two of the quadrilaterals are congruent.

(b) Write down the letters of these two quadrilaterals.

..... and .....

(1)

(c) Write down the letter of the quadrilateral with no lines of symmetry.

.....

(1)

(Total for Question 3 is 4 marks)

23 The diagram shows a regular pentagon, *ABCDE*, a regular hexagon, *CFGHID*, and a quadrilateral, *EDIJ*.

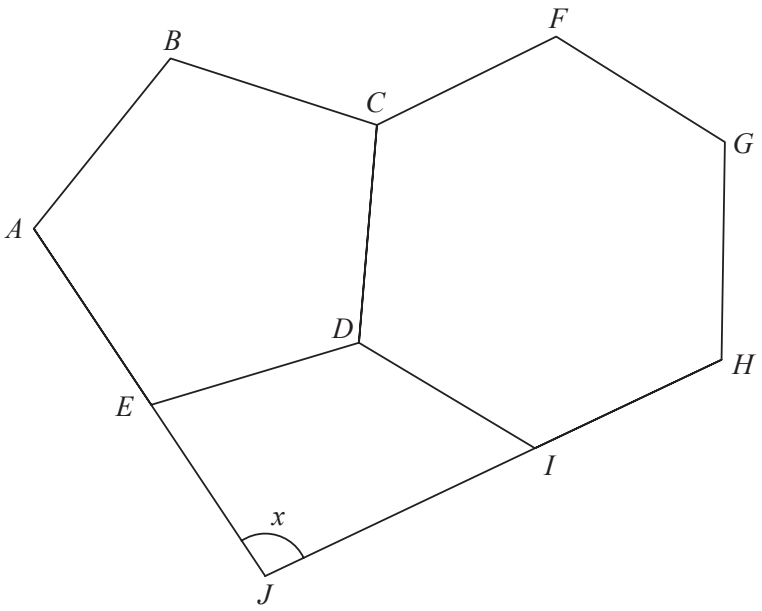


Diagram **NOT** accurately drawn

AEJ and *HIJ* are straight lines.

Work out the size of the angle marked *x*.
Show your working clearly.

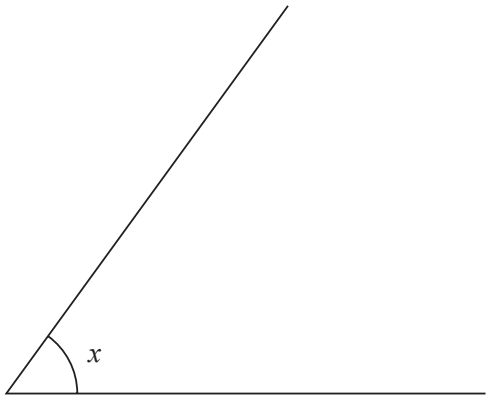
.....°

(Total for Question 23 is 5 marks)

2 (a) Write down the order of rotational symmetry of a square.

.....

(1)



(b) (i) Measure the size of the angle marked x.

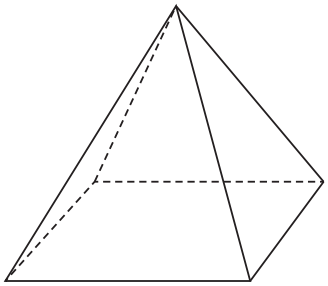
..... °

(ii) Write down the mathematical name of this type of angle.

.....

(2)

Here is a 3-D shape.



(c) (i) Write down the mathematical name of this 3-D shape.

.....

(ii) How many edges does this shape have?

.....

(2)

(Total for Question 2 is 5 marks)

21 The diagram shows a regular octagon *ABCDHIJK* and a pentagon *DEFGH*.

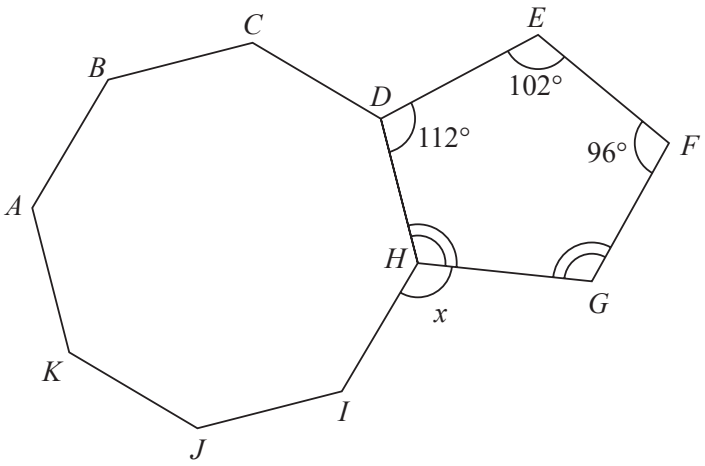


Diagram **NOT** accurately drawn

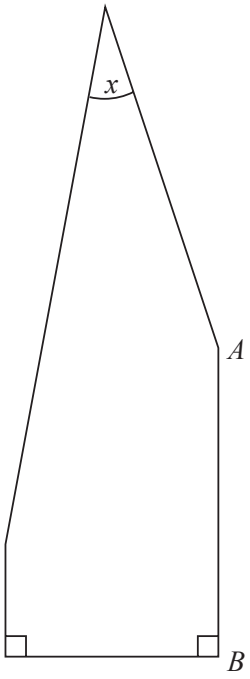
Angle *GHD* = angle *FGH*.

Work out the size of the angle marked *x*.
Show your working clearly.

.....°

(Total for Question 21 is 5 marks)

4 The diagram shows a 5-sided polygon.



(a) Measure the length of the side AB
Give the units of your answer.

....

(2)

(b) Measure the size of the angle marked x

..... °

(1)

(c) On the diagram, mark with arrows (>>) a pair of parallel sides.

(1)

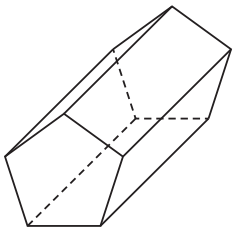
(d) Write down the mathematical name of a 5-sided polygon.

.....

(1)

(Total for Question 4 is 5 marks)

3 (a) Write down the mathematical name of this 3-D shape.



.....

(1)

(b) (i) How many faces does this shape have?

.....

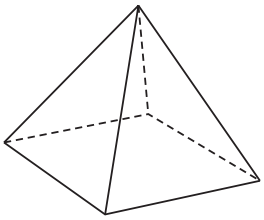
(1)

(ii) How many vertices does this shape have?

.....

(1)

Here is a different 3-D shape.



Marie makes a model of the shape.
She uses a length of wire to make each edge of the model.
Each edge of the model is 5 cm long.

Marie has 70 cm of wire.

(c) What length of wire does she have left after making the model?

..... cm

(2)

(Total for Question 3 is 5 marks)

27

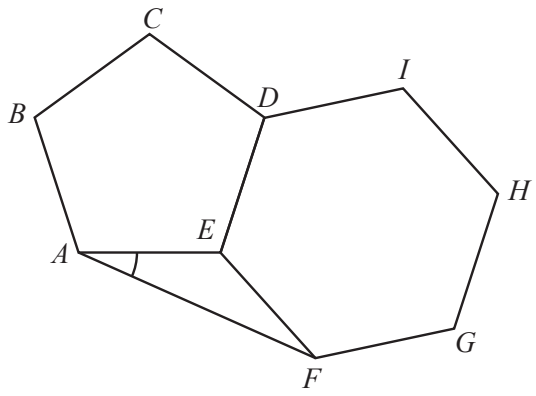


Diagram **NOT** accurately drawn

ABCDE is a regular pentagon.
DEFGHI is a regular hexagon.

AF is a straight line.

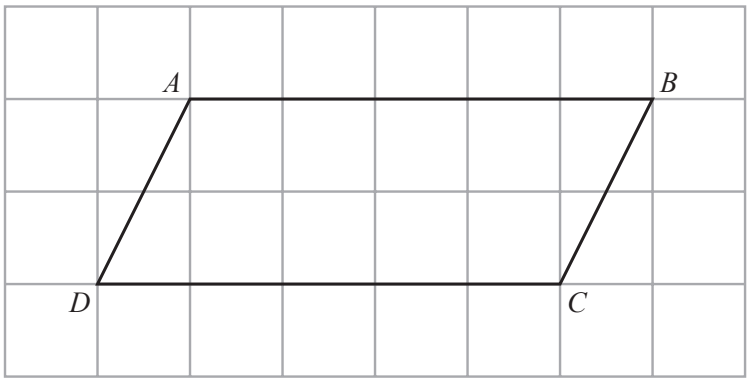
Work out the size of angle *EAF*

.....°

(Total for Question 27 is 5 marks)

TOTAL FOR PAPER IS 100 MARKS

5 The diagram shows a quadrilateral *ABCD* drawn on a square grid.



(a) Measure the length of *BC*.

..... cm

(1)

(b) Write down the mathematical name of quadrilateral *ABCD*.

.....

(1)

(c) Write down the order of rotational symmetry of quadrilateral *ABCD*.

.....

(1)

(d) On the diagram, mark an obtuse angle with the letter *x*.

(1)

Here is a diagram of a trapezium.

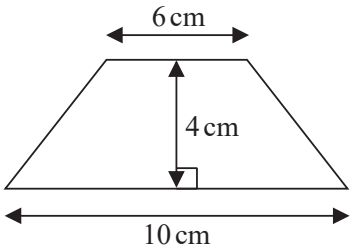


Diagram **NOT** accurately drawn

(e) Work out the area of the trapezium.

..... cm^2

(2)

(Total for Question 5 is 6 marks)

6 There are 32 children in a nursery.

Sandeep buys 5 boxes of balloons.
There are 25 balloons in each box.

Sandeep shares the balloons equally between the 32 children so that each child gets as many balloons as possible.

Work out the number of balloons that are not shared between the 32 children.

.....

(Total for Question 6 is 4 marks)

Answer ALL TWENTY TWO questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Here are five fractions.

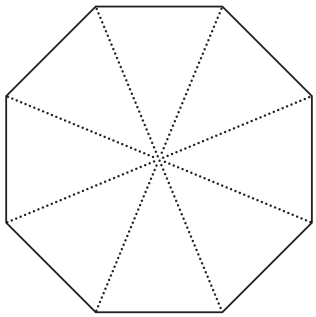
$\frac{2}{8}$	$\frac{3}{9}$	$\frac{5}{25}$	$\frac{7}{28}$	$\frac{8}{40}$

Two of the fractions in the table are equivalent to $\frac{1}{5}$

(a) Put a tick (✓) in the box underneath each of these two fractions.

(2)

The diagram shows an 8-sided polygon and its diagonals.



(b) Write down the mathematical name of an 8-sided polygon.

.....

(1)

(c) Shade $\frac{3}{4}$ of the polygon shown in the diagram above.

(1)

The area of a polygon is 56 cm^2

(d) Find $\frac{3}{4}$ of 56

.....

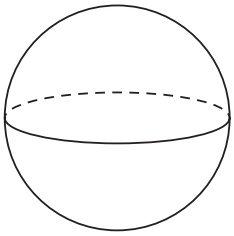
(2)

(Total for Question 1 is 6 marks)

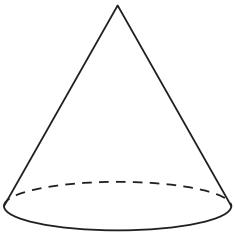
4 Here are three 3D shapes, **A**, **B** and **C**.

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

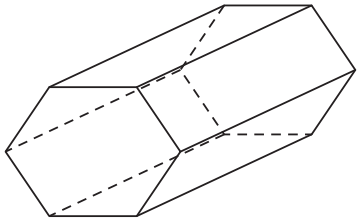
A



B



C



(i) ..... (ii) ..... (iii) .....

(3)

(b) (i) How many faces does shape **C** have?

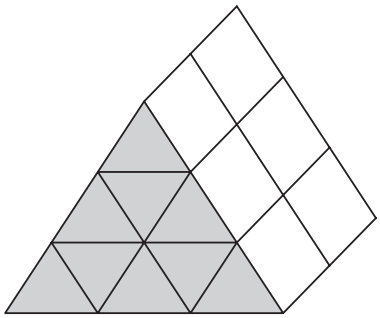
.....

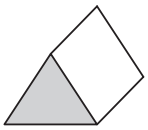
(ii) How many vertices does shape **C** have?

.....

(2)

Here is a solid prism made from bricks.
The bricks are identical triangular prisms.





one brick

Diagram **NOT** accurately drawn

The volume of the prism is 54 cm^3

(c) Work out the volume of each brick.

..... cm^3

(2)

(Total for Question 4 is 7 marks)

SUB-TOPIC G1c

BEARINGS

Sub-topic G1c · 15 questions · 60 marks · lowest tariff first

16 Show that $2\frac{4}{7} \div 1\frac{1}{8} = 2\frac{2}{7}$

(Total for Question 16 is 3 marks)

17 The bearing of Paris from London is 149°

Work out the bearing of London from Paris.

.....°

(Total for Question 17 is 2 marks)

15 A circle has radius 16 cm

Calculate the circumference of the circle.
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 15 is 2 marks)

16 The diagram shows the positions of two villages, A and B

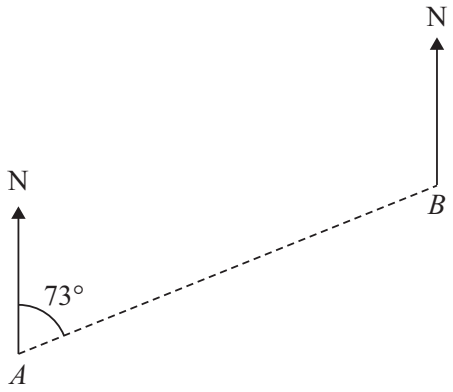


Diagram **NOT** accurately drawn

The bearing of B from A is 073°

Work out the bearing of A from B

..... °

(Total for Question 16 is 2 marks)

13 The diagram shows the positions of three villages, R, T and W.

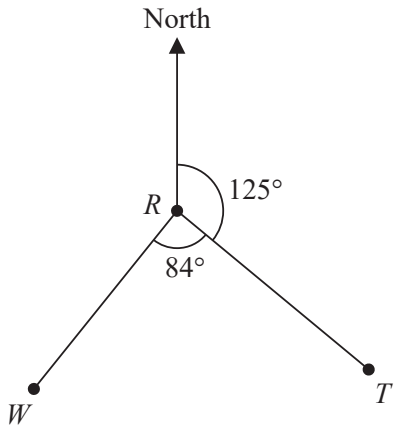


Diagram **NOT** accurately drawn

(a) Work out the bearing of village W from village R.

.....°

(1)

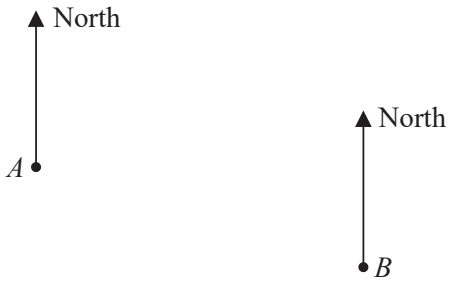
(b) Work out the bearing of village R from village T.

.....°

(2)

(Total for Question 13 is 3 marks)

9 The scale diagram shows the positions of a post office (A) and a police station (B) in a town.



(a) Measure the bearing of B from A.

.....°

(1)

The town hall is at a position C.
The bearing of A from C is 045°

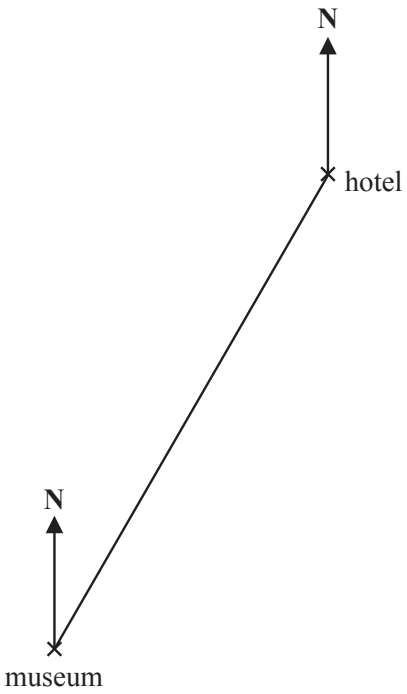
(b) Calculate the bearing of C from A.

.....°

(2)

(Total for Question 9 is 3 marks)

14 Here is an accurate scale drawing showing the positions of a hotel and a museum.



Scale: 1 cm represents 4.5 km

(a) Find, by measuring, the bearing of the hotel from the museum.

..... °

(1)

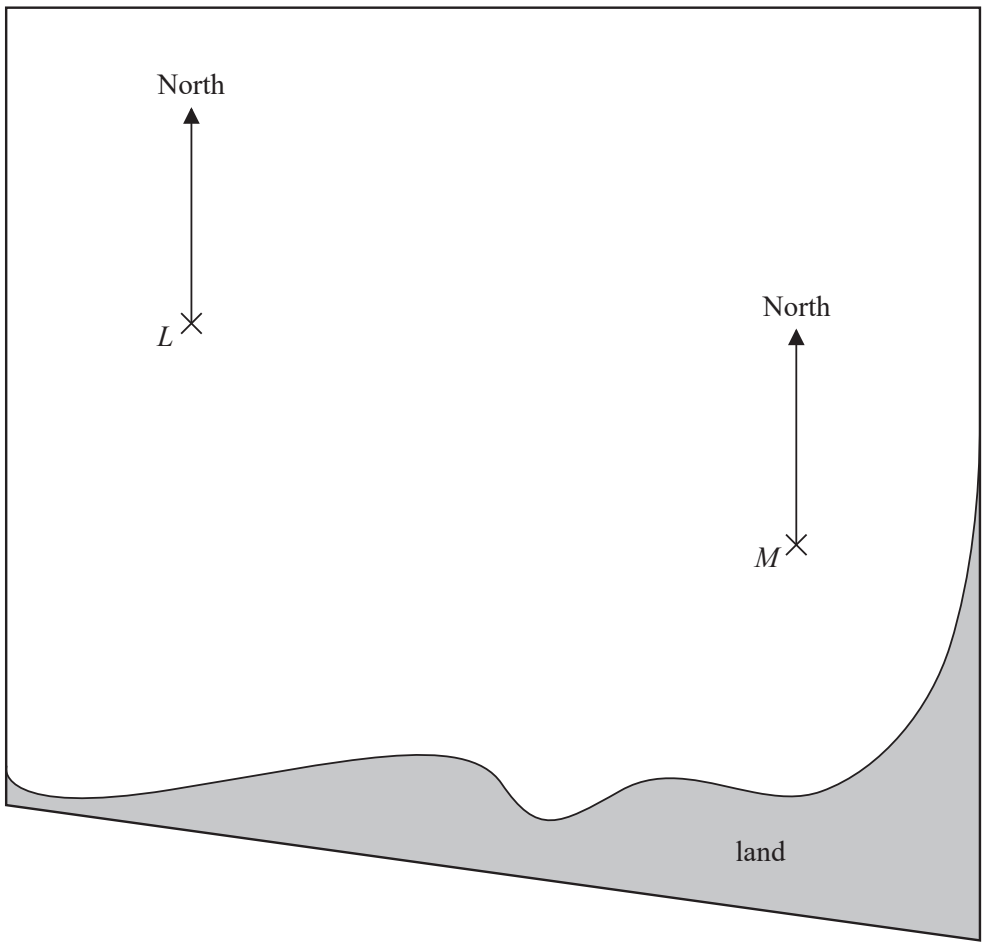
(b) Work out the real distance between the hotel and the museum.

..... km

(2)

(Total for Question 14 is 3 marks)

14 The accurate scale drawing shows the positions of two ships, L and M.



(a) Find the bearing of ship M from ship L.

.....°

(1)

The scale of the drawing is 1 cm to 5 km.

Ship P is 40 km from L and on a bearing of 240° from M.

(b) On the diagram, mark with a cross (×) the position of ship P.

(3)

(Total for Question 14 is 4 marks)

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

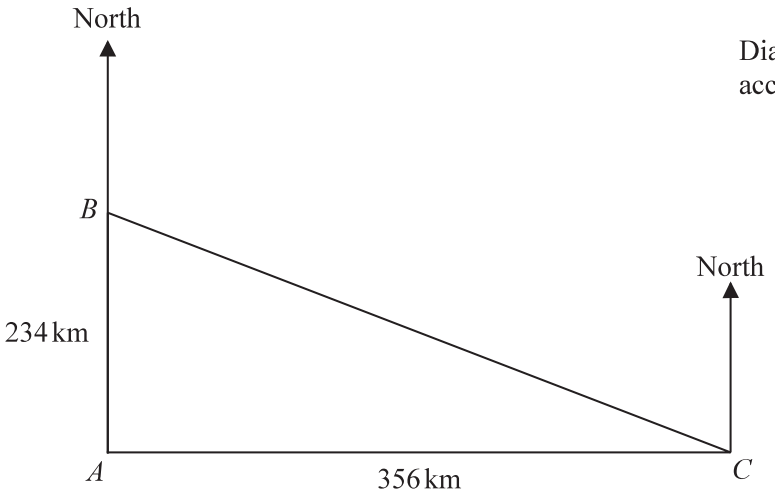


Diagram **NOT** accurately drawn

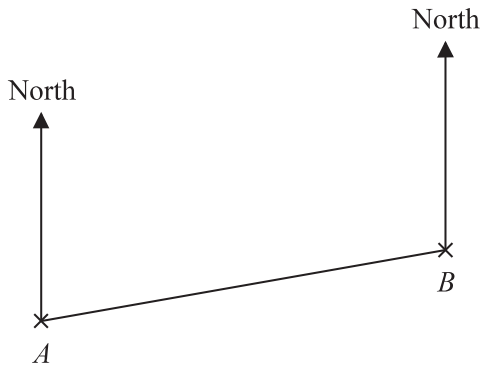
B is 234 km due north of A.
C is 356 km due east of A.

Work out the bearing of B from C.
Give your answer correct to the nearest degree.

.....°

(Total for Question 21 is 4 marks)

16 The scale diagram shows the position of two statues, A and B, on a map.



Scale: 2 cm represents 1 km

(a) Measure the bearing of B from A.

..... °

(1)

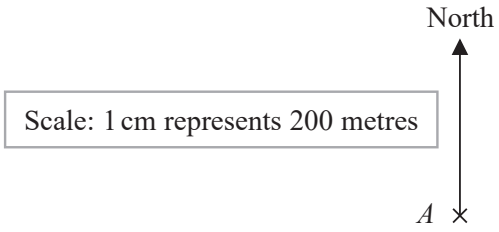
Another statue C is on a bearing of 120° from B.
Statue C is 4.5 km from B.

(b) Mark the position of statue C with a cross (×).
Label your cross C.

(3)

(Total for Question 16 is 4 marks)

20 The scale diagram shows the position on a map of a house, A



House C is on a bearing of 110° from A
The distance from A to C is 700 m

(a) Mark the position of C on the diagram with a cross (×)
Label your cross C

(3)

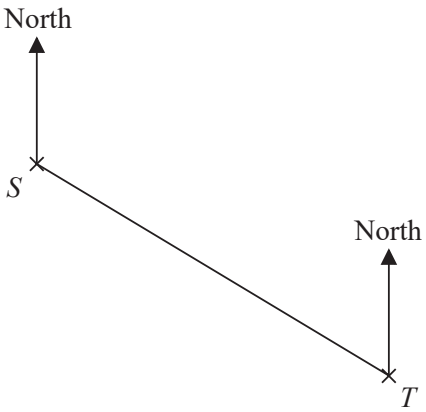
(b) Write the scale of the map in the form $1 : n$

1 : .....

(1)

(Total for Question 20 is 4 marks)

14 The accurate scale drawing shows the positions of two lighthouses, S and T



The scale of the drawing is 1 cm to 2 km

(a) Find, by measuring, the bearing of lighthouse T from lighthouse S

..... °

(1)

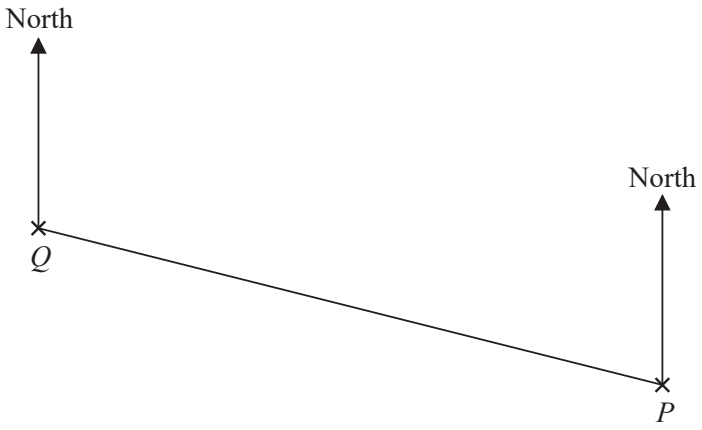
A boat is on a bearing of 084° from S
The boat is 13 km from T

(b) On the diagram, mark with a cross (×) the position of the boat.
Label the cross B

(3)

(Total for Question 14 is 4 marks)

16 The scale drawing shows the positions of two airports P and Q



scale: 1 cm represents 50 km

(a) Find, by measuring, the bearing of P from Q

..... °

(1)

A small plane flies directly from P to Q
The plane takes 2 hours to fly from P to Q

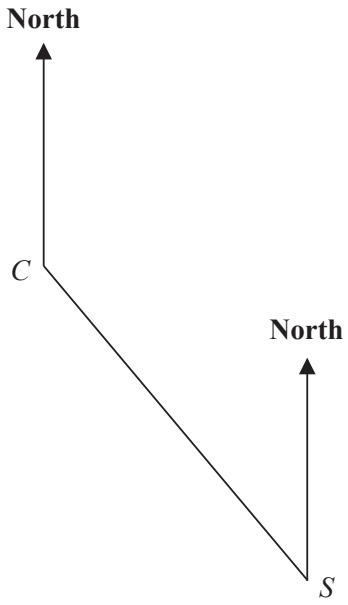
(b) Work out the average speed of the plane.
Give your answer in km/h

..... km/h

(3)

(Total for Question 16 is 4 marks)

17 The accurate scale drawing shows the position of a college C and a train station S



Scale: 1 cm represents 500 m

(a) Find the bearing of S from C

..... °

(1)

For Charles,
1 step = 0.44 m

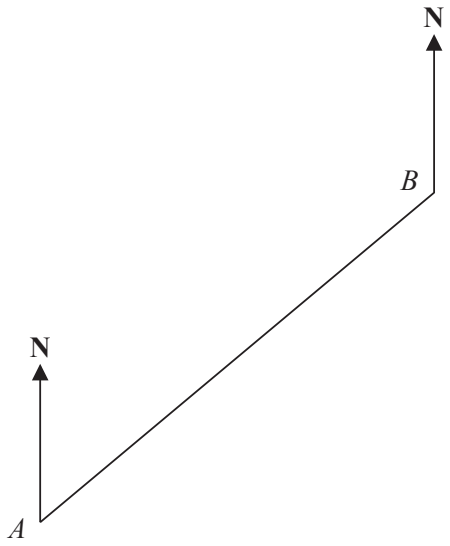
(b) Work out the number of steps Charles walks as he goes in a straight line from the college to the train station.
Give your answer correct to the nearest whole number of steps.

.....

(4)

(Total for Question 17 is 5 marks)

12 The scale drawing shows the positions of two boats, A and B



Scale: 1 cm represents 3 km

(a) Work out the actual distance, in kilometres, between A and B

..... km

(2)

Boat C is on a bearing of 110° from B
Boat C is 24 km from B

(b) On the scale drawing, mark with a cross (×) the position of boat C

(3)

(Total for Question 12 is 5 marks)

10 The accurate scale drawing shows the positions of two mobile phone masts, A and B.





The scale is 1 cm to 2.5 km.

(a) Find the bearing of A from B.

..... °

(1)

(b) Work out the actual distance, in km, between A and B.

..... km

(2)

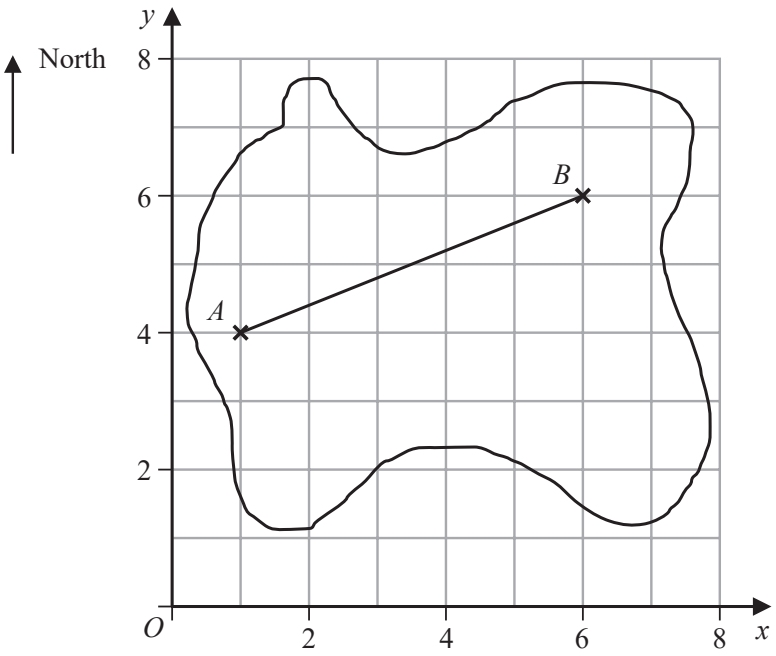
A third mobile phone mast, C, is put up.
C will be on a bearing of 115° from A.
C will be 20 km from B.

(c) Find the position of C.
Mark this point with a cross (×) and label it C.

(3)

(Total for Question 10 is 6 marks)

6 The accurate scale diagram shows the map of an island drawn on a centimetre grid.



The position of Aaron's house is A.
The position of Bharat's house is B.

(a) Write down the coordinates of A.

(..... , ...)

(1)

(b) By measurement, find the bearing of A from B.

..... °

(2)

(c) Measure the length of the line AB.
Give your answer in centimetres correct to one decimal place.

..... cm

(1)

Aaron cycled along a straight path from his house to Bharat's house.
The scale of the map is 1 cm represents 5 km.

(d) Work out the distance, in kilometres, that Aaron cycled.

..... km
(1)

Aaron left his house at 10 45 am and arrived at Bharat's house at 1 05 pm.

(e) How long did Aaron's cycle ride take him?
Give your answer in hours and minutes.

..... hours ..... minutes
(2)

(Total for Question 6 is 7 marks)

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7 (a) Solve $5x = 20$

$x =$ .....
(1)

(b) Simplify $3a \times 8b$

.....
(1)

(c) Simplify $8w - 4y + w - 3y$

.....
(2)

(d) Factorise fully $16 + 12t$

.....
(2)

(Total for Question 7 is 6 marks)

MARK SCHEMES

official mark schemes, in the same order as the questions

10	9 × 12 × 25 oe		2	M1
	Correct answer scores full marks (unless from obvious incorrect working)	2700		A1
				Total 2 marks

11	*ACB* = 53 or *ACD* or *BCE*= 180 – 53 (= 127) (must be seen on diagram or the angle stated) **or** 180 – (77 + 53)		2	M1	for *ACB* or a correct calculation for *ACD* or *BCE* **or** a correct calculation for *x*
	Correct answer scores full marks (unless from obvious incorrect working)	50		A1	
					Total 2 marks

Question		Working	Answer	Mark	Notes
11	a		101	1	B1
	b	$\sqrt{1025-1}$	32	2	M1 A1
12		180 − 124 = 56 56 ÷ 2	28	3	M1 M1 A1
13		$\frac{21}{24}-\frac{4}{24}$	Shown	2	M1 for 2 correct fractions with a common denominator A1 for $\frac{17}{24}$ from correct working e.g. $\frac{34}{48}=\frac{17}{24}$
14	a	15 − 8×(−4) or 15 + 32	47	2	M1 A1
	b	18 = 4p – 24	10.5	2	M1 A1 oe M1 $\frac{18}{4}=p-6$ A1 oe
15		240 m, 200 f $\frac{65}{100}\times$ "240" (= 156) or $\frac{85}{100}\times$ "200" (= 170) 156 + 170	326	4	B1 for 240 and 200 M1 as long as their numbers add up to 440 M1 (dep M1) A1 SC:B2 for 334

21	Angle *EBG* = 180 – 2 × 65 (= 50) or Angle *ABE* = 180 − (38 + 65) (= 77)	27	3	M1
	Angle *ABE* = 180 − (38 + 65) (= 77) **and** Angle *ABG* = "77" – "50"			M1 for a complete method to find angle *ABG*
				A1
				Total 3 marks
	Alternative scheme 1			
	Angle *EBG* = 180 – 2 × 65 (= 50) or Angle *EBC* = 103	27	3	M1
	Angle *EBC* = 103 **and** Angle *ABG* = 180 – (103 + "50")			M1 for a complete method to find angle *ABG*
				A1
				Total 3 marks

Question	Working	Answer	Mark	Notes
14 (a)	7 outcomes with at least one **C**		2	M1 Identify at least 6 (with no more than 2 incorrectly identified) outcomes with at least one **C** or an answer of $\frac{6}{16}$ **or** $\frac{8}{16}$ **or** $\frac{7}{n}$ where $n > 7$
		$\frac{7}{16}$		A1 Or 0.4375 or 43.75% (allow 2dp rounded or truncated)
(b)	$\frac{7}{16} \times 80$		2	M1 ft from (a) for value between 0 and 1 **or** for an answer of $\frac{35}{80}$
		35		A1 ft from (a)
				Total 4 marks

15	$\frac{180-80}{2}$ (= 50)		3	M1 could be marked correctly on diagram or in working with no contradiction
	360 –"50" – 90			M1 dep on first M1
		220		A1 cao
				Total 3 marks

8	a		a^4	1	B1
	b		$20bc$	1	B1
	c		$7d - 3e$	2	B2 (B1 for $7d$ or $-3e$ or $7d + -3e$)
					Total 4 marks

9	E.g. 42 ÷ 3 (= 14) or 68 ÷ 8 (= 8.5) or 42 × 3 (= 126) or $\frac{15}{8} \times 68$ (= 127.5)			M1 for a correct first step
	E.g. 9 × '14' + 15 × '8.5' oe or '126' + '127.5'			M1 for a complete method
		253.5	3	A1
				Total 3 marks

10	(180 – 44) ÷ 2 (= 68)			M1 May be seen on diagram
	180 – '68' **or** 44 + '68'			M1
		112	3	A1
				Total 3 marks

10		$4x + 6x + 11 + 9x - 18 = 126$ oe eg $19x - 7 = 126$ or eg $(126 + 18 - 11) \div 19$		4	M1	A correct equation or a correct calculation for x
		$x = 7$			A1	
		$0.5 \times (9 \times$ "7" $- 18) \times (4 \times$ "7") $(0.5 \times 45 \times 28)$			M1	Dep on M1
			630		A1	cao
						Total 4 marks

11		*ABD* = 180 – 143 (= 37) **or** *AEJ* = 76 **or** *CED* = 76 **or** *ECD* = 180 – 143 (= 37)		3	M1	may be marked on diagram
		180 – 76 – "37"			M1	A correct calculation for *EDC*
			67		A1	
						Total 3 marks

12		438 × 0.12 (= 52.56) **or** 44.39 ÷ 0.92 (= 48.25)		4	M1	
		438 × 0.12 (= 52.56) **and** 44.39 ÷ 0.92 (= 48.25) **or** 438 × 0.12 (= 52.56) **and** "52.56" × 0.92 (=48.355) or 44.39 ÷ 0.92 (= 48.25) **and** "48.25" ÷ 0.12 (= 402.083…)			M1	
		"52.56" – "48.25" **or** "48.355" – 44.39 = 3.965 **and** "3.965" ÷ 0.92 **or** 438 – "402.083…"(= 35.916..) **and** "35.916" × 0.12			M1	Dep on M2
			4.31		A1	
						Total 4 marks

11	$9.2\times\frac{500}{1000}$ **or** 9.2 ÷ 2 (= 4.6) oe		4	M1	for a method to find the cost of 500g of Cheddar
	6.3 – "4.6" (= 1.7)			M1	for a method to find the cost of 200g of Stilton
	"1.7"$\times\frac{1000}{200}$ **or** "1.7" × 5 oe			M1	for a complete method to find the cost of 1kg of Stilton
		8.5(0)		A1	
					Total 4 marks

12	eg $3x - 24 + 102 - x = 180$ oe **or** $90 + 90 + 3x - 24 + 102 - x = 360$ oe		3	M1	for setting up a correct equation
	eg $2x = 180 - 78$ oe **or** $2x = 360 - 258$ oe **or** eg (180 + 24 – 102) ÷ 2 **or** 360 – (90 + 90 – 24 +102) ÷ 2			M1	for simplifying and isolating the x term **or** for a complete calculation to find the value of x
		51		A1	
					Total 3 marks

13	(a)	150 ÷ (90 ÷ 18) oe eg 150 ÷ 5			2	M1 for a complete method to find the number of people for running
				30		A1 if answer line is blank, check the table for answer
	(b)	eg 360 − (90 + 150 + 15 × "5") (= 45) oe	eg 360 ÷ "5" (= 72)		3	M1 for working out the angle for swimming **or** the total number of people check the table for answers ft their "5" from 90 ÷ 18
		"45" ÷ "5"	"72" – (18 + 15 + "30")			M1 for a complete method to work out the number of people for swimming ft their "5" from 90 ÷ 18 ft their "30" from (a)
				9		A1 if answer line is blank, check the table for answer
						Total 5 marks

7	1620 × 0.9(0) (= 1458)		4	M1
	1620 ÷ 1.08 (= 1500)			M1
	"1500" – "1458"			M1
	Correct answer scores full marks (unless from obvious incorrect working)	42		A1
				SC B1 for 1620 ÷ 0.9 (= 1800) **and** 1620 × 1.08 (= 1749.6(0)) or for "1800" – "1749.6(0)" (= 50.4(0))
				Total 4 marks

8	(a)	3 × 25 + 30 + 42 or 75 + 30 + 42		2	M1
		Correct answer scores full marks (unless from obvious incorrect working)	147		A1
	(b)	220 – 65 − 30 (= 125) or 220 – 95 (= 125)		3	M1
		"125" ÷ 25 or 5 × 25 (= 125)			M1
		Correct answer scores full marks (unless from obvious incorrect working)	5		A1
					Total 5 marks

9	(a)		60	1	B1 cao
	(b)(i)		58	1	B1
	(ii)		correct reason	1	B1 for <u>angles</u> in a <u>triangle</u> add up to 180° or for angles in a <u>triangle</u> add up to <u>180°</u>
					Total 3 marks

Question	Working	Answer	Mark	Notes
8	*DBC* = 104 or 180 – 104 (= 76)		3	M1 for correctly finding *DBC* or *EBC* or *ABD* May be seen on the diagram This is not awarded if the angles are incorrectly assigned (Ignore incorrect angles on the diagram if a student shows 38 on the answer line)
	$\frac{180-104}{2}$ oe or $\frac{76}{2}$ oe			M1
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	38		A1 cao
				Total 3 marks

Question	Working	Answer	Mark	Notes
20	30.5 ÷ 8 (= 3.8125) **OR** 60 ÷ 8 (= 7.5) "3.8125" × 60 **OR** 30.5 × "7.5"	228.75	3	M1 M2 for $30.5 \div \frac{8}{60}$ oe M1 A1 accept 229, 228.8
21	$3x + 10 = x + 52$ $3x - x = 52 - 10$ **or** $2x = 42$ **or** $x = 21$ $y = 180 - 2 \times ("21" + 52)$ **or** $y = 180 - 2 \times (3 \times "21" + 10)$ **or** $y = 180 - ("21" + 52) - (3 \times "21" + 10)$	34	4	M1 for equating the expressions for angle *P* and angle *Q* M1 for isolating the terms in *x* M1 for a complete method A1 dep on M2
22	eg $\frac{187}{147}$ **or** $\frac{147}{187}$ **or** $\frac{90}{187}$ **or** $\frac{187}{90}$ eg $90 \div \frac{187}{147}$ **or** $90 \times \frac{147}{187}$ **or** $147 \times \frac{90}{187}$ **or** $147 \div \frac{187}{90}$	71	3	M1 for an appropriate scale factor, candidates may work in either cm or m M1 for a complete method, candidates may work in either cm or m A1 70.7 – 71

Question	Working	Answer	Mark	Notes
14	75 + (180 – 123) or 180 – (75 + (180 – 123)) 132° e.g. Vertically opposite angles are equal. Angles on a straight line add up to 180° Angles in a triangle add up to 180° Or Vertically opposite angles are equal Angles on a straight line add up to 180° exterior angle of a triangle is equal to the sum of the opposite interior angles	132 and a full set of reasons for method used	4	M1 Correct method to find angle x A1 Correct value for x B2 For a correct full set of reasons for the method used B1 for two correct reasons for a method used.
15 (a)		$12 < d \leq 16$	1	B1
(b)	$2 \times 16 + 6 \times 18 + 10 \times 19 + 14 \times 27 + 18 \times 20$ $= 32 + 108 + 190 + 378 + 360$ (=1068) '1068' ÷ 100	10.68	4	M2 $f \times d$ for at least 4 products with correct mid- interval values and intention to add. If not M2 then award M1 for d used consistently for at least 4 products within interval (including end points) and intention to add or for at least 4 correct products with correct mid-interval values with no intention to add M1 dep on at least M1 Allow division by their $\sum f$ provided addition or total under column seen A1 Accept 10, 10.7 and 11

20	$30 + 4x + 10 + x + 20$ (= $5x + 60$) **or** $180 - 30$ (=150)		4	M1	Allow $5x + 60 = n$ where $n \neq 180$ or for subtracting 30 from 180	M2 for $5x + 30 = 150$ oe
	e.g. $30 + 4x + 10 + x + 20 = 180$ **or** $5x + 60 = 180$ oe **or** $180 - 30 - 10 - 20$ (=120) oe eg $180 - 60$			M1	for setting up the equation or for subtracting all numerical values of angles from 180	
	$5x = 120$ **or** "120" ÷ 5			M1	dep on M2 for correctly simplifying to $ax = b$ or for dividing "120" by 5	
		24		A1	for 24	
						Total 4 marks

21		Fully correct angle bisector with all relevant arcs shown	2	B2	Fully correct angle bisector with all arcs shown. B1 for all arcs and no angle bisector drawn or for a correct angle bisector within guidelines but not arcs or insufficient arcs
					Total 2 marks

Question	Working	Answer	Mark	Notes
14 (a)	$\frac{40}{750}$ oe		2	M1 Numerator and denominator must be integers.
		$\frac{4}{75}$		A1
(b)	$\frac{40}{100} \times 6.8$ oe		2	M1
		2.72		A1
(c)	$\frac{3}{40} \times 100$ oe		2	M1
		7.5		A1
				Total 6 marks

15	$\angle ABC = 360° - 298° (= 62°)$ or $\angle BCA = 97°$		4	M1 Could be marked on diagram
		21		A1
	vertically opposite, (are equal) angles at (around) a point, (= 360°) angles in a triangle (= 180°)			B2 B2 for 3 correct reasons which must include the underlined words B1 for 1 or 2 correct reasons which must include the underlined words Any B marks dep on M1
				Total 4 marks

16	10 × 5 + 30 × 11 + 50 × 8 + 70 × 19 + 90 × 9 (50 + 330 + 400 + 1330 + 810)		3	M2 Correct products using midpoints (allowing one error) with intention to add. M1 for products using frequency and a consistent value within the range (allowing one error) with intention to add. or correct products using midpoint without intention to add.
		2920		A1 N.B. 2920 ÷ 52(=56.15...) gains M2 only
				Total 3 marks

6	5 × 25 (= 125)		4	M1	total number of balloons
	'125' ÷ 32 (= 3.9….)			M1	
	'125' – (32 × 3) or 125 – 96 **or** $3\frac{29}{32}$			M1	
		29		A1	
					Total 4 marks

Alternative Mark Scheme for Q6					
6	5 × 25 (= 125)		4	M1	
	32 × 3 (= 96) **or** 32 × 4 (= 128)			M1	
	'125' – (32 × 3) or '125' – 96			M1	
		29		A1	
					Total 4 marks

7	180° – (104° + 42°) (= 34°) or $\frac{180° - '34°'}{2}$		4	M1	for one correct stage
		73		A1	for 73
	• Angles in a triangle sum to 180° or (angles in a triangle sum to 180°) • Angle *BDC* and angle *DBA* are alternate angles • Base angles in an isosceles triangle are equal **or** (Allied / co-interior angles add up to 180°)	correct reasons		B2 (B1	dep fully correct method. for all correct reasons for the method used NB allied angles may not be needed if using *ABD* sum to 180° dep M1 for one correct reason)
					Total 4 marks

9	360 – (59 + 115 + 68) (= 118)		4	M1	angle values may be seen on diagram throughout
		$x = 62$		A1	from correct working
	Angles in a quadrilateral add up to 360. Accept "4-sided shape" Angles on a straight line add to 180° Base angles in an isosceles triangle (are equal)			B2 (B1	(dep on M1) for all correct reasons for their method (dep on M1) for 1 correct reason for their method)
					Total 4 marks

10	5.75 ÷ 5 (= 1.15)		3	M1	for finding the cost of one chocolate bar
	e.g. (7.85 – 2 × "1.15") ÷ 3			M1	(dep on M1) for a complete method to find the cost of one packet of sweets
		1.85		A1	cao
					Total 3 marks

11		11 hours and 45 minutes	2	B2 (B1	for 11 hours and 45 minutes for 11 hours or 45 minutes)
					Total 2 marks

8	for at least two of: 8, 200, 0.5		3	M1
	$\frac{1600}{0.5}$ or 8×400 or 16×200			M1
		3200		A1 dep M1 (allow 3000)
				Total 3 marks

9	(a)(i)		58	1	B1
	(ii)	Vertically <u>opposite angle(s)</u> are equal or <u>Vertically opposite</u>		1	B1 reason given dep on a correct angle in (i)
	(b)	*DBA* = 180 − 132 (= 48) or for 132 − 58		2	M1 48 could be shown clearly on diagram
			74		A1
					Total 4 marks

10		BB, BH, BA RB, RH, RA SB, SH, SA	2	B2 for all 9 combinations with no extras or repeats. (B1 for at least 5 correct combinations (ignoring extras and repeats))
				Total 2 marks

9	(*ABD* =) 360 – 52 – 112 – 90 (= 106)		4	M1 may be marked in correct place on diagram
	(*CBD* =) 180 – "106" (=74)			M1 may be marked in correct place on diagram
		32		A1
		Reasons given		B1 dep on M1 At least two appropriate reasons given. "angles in a quadrilateral add to 360°" accept 4-sided shape. "angles on a straight line add to 180°" **or** angles on a straight line add to 180° "angles in a triangle add to 180°" **or** angles in a triangle sum to 180° "base angles in an isosceles triangle (are equal)"
				Total 4 marks

15	angle *ABE* = 73 **or** angle *BEF* = 73 **or** angle *GEF* = 180 – 73 (=107) **or** angle *DEB* = 180 – 73 (=107) **or** 360 – 73 – 124 **or** 180 – (124 – "107")		4	M1 **could be on diagram**
	A correct angle scores 2 marks	163		A1
				B2 **dep on M1 and a complete method** for all reasons appropriate for their method (B1 dep on M1 for one reason appropriate for their method) eg Angles on a straight line sum to 180º Angles on a straight line sum to 180º Vertically opposite angles are equal. Vertically opposite angles are equal. Corresponding angles are equal. Alternate angles are equal Allied angles sum to 180° (or co-interior angles) Angles at a point (or full turn) add up to 360º (or angles at a point)
				Total 4 marks

7	(a)		45*cd*	1	B1 oe Allow 45*dc*, *c*45*d*, *d*45*c*, *cd*45 or *dc*45 Allow upper case letters
	(b)		$-2p + 8n$	2	B2 oe eg. $8n - 2p$ If not B2 then award B1 for $-2p$ or $8n$
	(c)	8×9 and $(-)6 \times 5$ oe or 72 and ± 30 oe		2	M1
			42		A1 SCB1 for −14
	(d)	$5m = 17 + 6$ or $5m = 23$ or $m - \frac{6}{5} = \frac{17}{5}$ or $m - 1.2 = 3.4$ or $-17 - 6 = -5m$ or $-23 = -5m$ or $(17 + 6) \div 5$ oe		2	M1 for a correct first step or a calculation for *m*
		$4 - 3$	$\frac{23}{5}$		A1 oe eg. 4.6 Allow 4,6
					Total 7 marks

8		AE, AP, AW, EP, EW, PW	2	B2 for all combinations with no repeats or incorrect combinations (Allow lower case letters) If not B2 then award B1 for at least 4 correct combinations (ignore repeats or incorrect combinations)
				Total 2 marks

9	360 – 296 (= 64)		4	M1 allow angles on the diagram
	180 – (“64” + 42) (= 74)			M1
	(180 – (“64” + 42)) ÷ 2 or “74” ÷ 2			M1
		37		A1
				Total 4 marks

Question		Working	Answer	Mark	Notes
8	(a)		32	1	B1
	(b)(i)	eg 180 – 125 or $\frac{360-2\times125}{2}$ or *JBC* = 55 (in working or on diagram) or *ACL* = 125 (in working or on diagram) *BCG* = 55 *GCD* = 125		2	M1
		Working not required, so correct answer scores full marks (unless from obvious incorrect working)	55		A1
	(ii)		one correct reason	1	B1 Dep on M1 in (b)(i) for a correct reason angles on a straight line add to 180 angles on a straight line add to 180 corresponding angles are equal allied angles opposite angles co-interior angles angles around a point angles around a point add to 360 (award mark for a correct reason so long as no more than one incorrect reason also given)
					Total 4 marks

7	180 – 138 (= 42)		4	M1 NB If angles are on the diagram they must be from correct working and correctly assigned
	360 – (“42” + 107 + 125)			M1
	Correct answer scores full marks (unless from obvious incorrect working)	86		A1
		one correct reason		B1 dep on M1for one correct reason (i) Angles on a straight line add to 180° or angles on a straight line add to 180° (ii) Angles in a quadrilateral sum to 360° or angles in a quadrilateral sum to 360°
				Total 4 marks

8	(a)		$\frac{27}{80}$	1	B1 oe 0.33(75) or 33(.75)% truncated or rounded
	(b)	80 – (27 + 10) (= 43) oe or 80 – 37 (= 43) $\frac{80-(27+10)}{80}$ oe or $\frac{80-37}{80}$		2	M1
		Correct answer scores full marks (unless from obvious incorrect working)	$\frac{43}{80}$		A1 oe 0.53(75) or 53(.75)% truncated or rounded NB Penalise incorrect notation once
					Total 3 marks

9	41.25 ÷ 15 oe or 2.75 oe or $\frac{52}{15} \times 41.25$ oe	2	M1
	Correct answer scores full marks (unless from obvious incorrect working)	143	A1
			Total 2 marks

Question	Working	Answer	Mark	Notes
8	(angle *EAD* or *ADE* or *AED* =) 60 (angle *BCD* =) 180 – 108 (=72) (angle *BAD* =) 360 – (135 + "72" + 90) (=63) **or** (angle *BAD* =) 360 – 297 (=63) **or** (angle *EAB* =) 123	123	5	B1 may be seen on diagram M1 may be seen on diagram M1 may be seen on diagram B1 (dep on M1) for at least **one** correct reason **reason 1** : Angles on straight line add up to 180º **or** Angles on straight line add up to 180º **reason** 2 :Angles in a quadrilateral (accept 4-sided shape) add up to 360º **or** Angles in a quadrilateral (accept 4-sided shape) add up to 360º A1 for 123 and full reasons
9 a	Two readings from graph 20ºC apart eg. readings from 0ºC (30 – 34 ºF) and 20ºC (66 – 70 ºF)	36	2	M1 A1 accept answer in range 34 – 38
b		No with explanation	1	B1 e.g. graph does not go through (0,0) (accept 0) **or** temperatures in ºF are not proportional to temperatures in ºC **or** gives counter example that doubling does not work **or** 60ºC is the same as 140ºF (135 – 145) **or** 15ºC is not 43ºF

Question	Working	Answer	Mark	Notes
13	Angle BCD = 180 – 68 (=112) or angle *BAD* (or *BDA*) = (180 – 48) ÷ 2 (=66) angle *BDC* = 360 – 243 – "66" (=51) **or** angle *ADC* = 360 – 243 (=117) e.g. 68 – "51" (=17) **or** 180 – (180 – 68) – "51" **or** 360 – "117" – "66" – (180 – 68) – 48	17 with reasons	5	M1 Could be seen on diagram M1 Could be seen on diagram M1 for a complete method B1 dep on M1 for any one correct appropriate reason A1 for correct answer with full reasons E.g. Base angles of an isosceles triangle are equal Angles in a triangle sum to 180º Angles at a point add up to 360º / full turn Angles on a straight line sum to 180º **or** exterior angle equals the sum of interior opposite angles Angles in a quadrilateral add up to 360º
14	300 × 0.08 oe (=24) **or** 300 × 9.5 (=2850) **or** 100(%) – 8(%) (=92(%)) **or** 1 – 0.08 (=0.92) 300 – "24" (=276) **or** for 0.08 × "2850" (=228) **or** "0.92" × 300 (=276) "276" × 9.5 **or** "2850" – "228" oe	2622	4	M1 M1 M2 for 0.92 ×"2850" M1 A1

8		angle *DBC* (or *DBC*) = (180 – 116) ÷ 2 (=32)		5	M1	angles may be seen on diagram
		angle *ADB* = 180 – (90 –"32") – 55 (=67) **or** angle *ADB* = 360 – 116 – "32" – 55 – 90 (=67)			M1	dep
		x = 360 – 116 – "67" (= 177)			M1	dep
			177 with reasons		A2	for 177 and full reasons base angles in an isosceles triangle are equal angles in a triangle add up to 180° angles at a point add up to 360° If not A2 then A1 for 177 with 1 correct reason (SCB1 dep on M1 for a correct reason explicitly linked to their correct method)
						Total 5 marks

7	(a)(i)			38	1	B1
	(ii)			Angles in a triangle sum to 180°	1	B1 Allow Angles in a triangle sum to 180°
	(b)	Quad *ABDE* 360 – 78 – 90 – 17 – (a)(i) (360 – 223)	Line and quad *ACDE* 360 – 90 – 78 – (180 – 125) 360 – 90 – 78 – '55'		3	M1 ft from (ai)
				137		A1
				Reason(s)		B1 for full reasons E.g. Angles in a quadrilateral sum to 360° (accept Angles in a quadrilateral sum to 360°) **OR** Angles on a straight line sum to 180° (accept Angles on a straight line sum to 180°) **and** Angles in a quadrilateral sum to 360° (accept Angles in a quadrilateral sum to 360°) Accept 4 sided shape for quadrilateral
						Total 5 marks

17	a	150 ÷ 6 × 14 oe		2	M1
			350		A1
	b	630 ÷ 90 × 6 oe		2	M1
			42		A1
	c	162 ÷ (2 + 7) × 2 oe		2	M1
			36		A1
					Total 6 marks

18	*ADC* = 180 – 58 (= 122) **or** *EDF* = 122 **or** *CDE* = 58 **or** *ADF* = 58		5	M1	may be seen marked on the diagram
	e.g. *DEF* = 58 ÷ 2 **or** *DEF* = (180 – 122) ÷ 2			M1	complete method to find angle *DEF*
		29		A1	
				B2	dep on M2 for fully correct reasons for their method (B1 dep on M1 for one correct reason stated and used) e.g. Allied angles, co-interior angles, Alternate angles, Corresponding angles, Vertically opposite angles are equal (or Vertically opposite angles are equal), Angles on a straight line add up to 180°(or angles on a straight line add to 180°), Sum of two angles in a triangle are equal to opposite exterior angle, Angles in a triangle add up to 180°(or Angles in a triangle add up to 180°), Base angles in an isosceles triangle Angles in a quadrilateral add up to 360. (accept "4-sided shape"or parallelogram) Opposite angles of a parallelogram are equal
					Total 5 marks

Question	Working	Answer	Mark	Notes
19	Angle *EBC* or *ECB* = (180 – 44) ÷ 2 (= 68)		5	M1 Could be seen on diagram
	Angle *GBC* = 180 – "68" (= 112) **or** Angle *GBC* = "68" + 44 (= 112) **or** Angle *BGH* = "68" (same as *EBC*) Angle *ABE* = 180 – "68" (= 112) **and** Angle *BGF* = "112" **or** Angle *ABG* = "68" **and** Angle *BGH* = "68" or Angle *FGJ* = "68" **or** Angle *BGF* = 180 – "68"(=112)			M1 for a method to as far as one step away from working out Angle *JGH* (an angle corresponding or vertically opposite to *JGH* or at the same point on a straight line with *JGH*) Could be seen on diagram. (the award of this mark also implies the previous M1)
	Working not required, so correct angle scores 3 marks (unless from obvious incorrect working)	112		A1 Could be seen in correct place on diagram
	NB: reasons must include the underlined words *Accept ∠ for angle(s) and □ for triangle* **For all angles**: They must be clearly stated as the correct angle or shown on the diagram in the correct position. (eg just seeing 68 in working without a label is not sufficient for the award of a mark for angle *EBC*)			B2 for correct answer with full reasons for their method eg isosceles triangle (or 2 equal sides, 2 equal angles) Angles in a triangle sum to 180° or angles in a triangle Angles on a straight line sum to 180° Angles on a straight line sum to 180° Exterior angle in a triangle is equal to the two opposite interior angles. Vertically opposite angles are equal. Vertically opposite angles are equal. Corresponding angles are equal. Alternate angles are equal Allied angles sum to 180° (or co-interior angles) Angles at a point (or full turn) add up to 360° (or angles at a point) (B1 for one correct reason appropriate to their method, dep on M1)
				Total 5 marks

7	(a)		$2c + 7d$	2	B2	(B1 for $2c$ or $7d$)
	(b)		$40ef$	1	B1	
	(c)	$5r = 8 + 3$ or $5r = 11$ or $-3 - 8 = -5r$ or $-11 = -5r$ or $r - \frac{3}{5} = \frac{8}{5}$ or $(8 + 3) \div 5$		2	M1	for a correct first step or for a calculation for r
			2.2		A1	oe
						Total 5 marks

8	(a)	(DBC =) 180 – (93 + 42) (= 45) **OR** (x =) 93 + 42		2	M1	for method to find angle DBC **OR** using exterior angle is equal to the sum of the two opposite interior angles
			135		A1	
	(b)(i)	360 – (90 + 100 + 114) oe		2	M1	for a complete method to find y
			56		A1	
	(ii)		Angles at a point sum to 360°	1	B1	
						Total 5 marks

9	0.4 × 2500 (1000) **or** 0.6 × 2500 (= 1500) oe		4	M1	for finding 40% or 60% of 2500
	2500 – "1000" – 300 (= 1200) oe **or** "1500" – 300 (= 1200) oe			M1	for method to find the remaining money
	"1200" ÷ (3 + 7) × 7 oe			M1	for method to find the amount of money spent on food
		840		A1	
					Total 4 marks

4	(a)		Pentagon	1	B1
	(b)		Marked at 360	1	B1
	(c)		1 45	1	B1 oe e.g. 1345, quarter to two/2 Ignore any am or pm
	(d)		centimetres	1	B1 or cm
					Total 4 marks

5	(a)(i)		6 or 8	1	B1 allow 6 and 8
	(ii)		27	1	B1 cao
	(iii)		25	1	B1 cao
	(iv)		3 or 7 or 11	1	B1 allow two or more of 3, 7, 11
	(b)	$(2^2 + 5) \times (2 + 3^2) = 99$	Two correct pairs of brackets	1	B1 cao
					Total 5 marks

6	(a)(i)		132	1	B1 cao
	(ii)		correct reason	1	B1 for angles on a straight line add up to 180 Accept angles on a straight line add up to 180
	(b)	180 ÷ 3 (= 60)		3	M1 or for an angle of 60 in the triangle
		360 – (105 + 125 + "60")			M1 for a correct complete method
			70		A1
					Total 5 marks

8		add 489 to 13 203	2	B2	oe eg accept 489 + 13 203 (B1 for sight of 489 × 27 = 13 203)
					Total 2 marks

9	(a)		$7p - t$	2	B2	Fully correct answer (allow $-1t$) (B1 for $7p$ or $-t$)
	(b)	eg 8 × 5 – 3 × 4 **or** 40 – 12		2	M1	for a complete method
			28		A1	
						Total 4 marks

10	(a) (i)		35	1	B1	if answer line is blank, check the diagram
	(ii)	vertically opposite angles are equal **or** vertically opposite angles are equal		1	B1	
	(b) (i)	(*BEC* =) 180 – 90 – 35 (= 55) **or** (*BEH* =) 35 + 90		2	M1	for a method to find angle *BEC* **or** *BEH*
			125		A1	if answer line is blank, check the diagram
	(ii)	eg Angles in a triangle add to 180° (allow angles in a triangle add to 180°) Angles in a triangle sum to 180° (allow angles in a triangle sum to 180°) Angles on a straight line add to 180° (allow angles on a straight line add to 180°) The exterior angle of a triangle is equal to the sum of the interior opposite angles		1	B1	(dep on M1) for one correct reason
						Total 5 marks

10	*BCD* = 108		5	M1	for angle *BCD* = 108 can be seen on diagram
	eg 360 – ("108" + 135 + 54) (= 63) or 360 – 297 (= 63)			M1	for method to find angle *BAD* can be seen on diagram (63 or 297 implies the previous M1)
	Correct answer scores full marks (unless from obvious incorrect working)	117		A1	for 117 can be seen on diagram
	(i) Vertically opposite angles are equal Vertically opposite angles are equal (ii) Angles in a quadrilateral sum to 360º or angles in a quadrilateral sum to 360° Accept "4-sided shape" (iii) Angles on a straight line add to 180° or angles on a straight line add to 180°			B2 (B1	(dep on M1) for two correct reasons for their method (dep on M1) for 1 correct reason for their method)
					Total 5 marks

11	(a)		5	1	B1	
	(b)		3	1	B1	
	(c)	eg 0 × 3 + 1 × 7 + 2 × 6 + 3 × 11 + 4 × 1 + 5 × 2 (= 66) **or** 0 + 7 + 12 + 33 + 4 + 10 (= 66)		3	M1	for at least 5 correct products and intention to add
		"66" ÷ 30			M1	
		Correct answer scores full marks (unless from obvious incorrect working)	2.2		A1	oe
						Total 5 marks

5	(a)(i)		9	1	B1 cao
	(ii)		24	1	B1 cao
	(iii)		8	1	B1 cao
	(iv)		2	1	B1 cao
	(b)		76	1	B1 cao
					Total 5 marks

6	(a)(i)		125	1	B1 cao
	(ii)		correct reason	1	B1 for Angles around a point add up to 360° or Angles around a point add up to 360°
	(b)	*ABD* = 180 – 54 (= 126) or *BDC* = 180 – 2 × 54 (= 72) or *BDC* = 180 – 108 (= 72)		3	M1 NB If angles are on the diagram they must be correctly assigned or if angle notation is used it must be correctly assigned
		360 – (98 + 90 + "126") or 360 – (98 + 90 + 54 + "72") or 360 – 314			M1 for a complete method
		Working not required, so correct answer scores full marks (unless from obvious incorrect working)	46		A1
					Total 5 marks

12	*CED* = 180 – 125 (= 55) or *BCD* = 360 – (86 + 78 + 128) (= 68)		5	M1 angles may be marked on diagram or labelled unambiguously in working
	DCE = 180 – (2 × "55")(= 70)			M1 angles may be marked on diagram or labelled unambiguously in working
	Correct answer of 138 scores 3 marks (unless from obvious incorrect working)	138		A1 for 138
				B2 (dep on M2) for all correct reasons for their method (B1 (dep on M1) for one correct reason for their method) Angles on a straight line add to 180 Angles on a straight line add to 180 Isosceles triangle Angles in a triangle add to 180 Angles in a triangle add to 180 Angles in a quadrilateral add to 360 Angles in a quadrilateral add to 360
				Total 5 marks

13	(a)	2*n* **or** *n* + 7		2	M1 for 2*n* oe **or** *n* + 7 oe
		Correct answer scores full marks (unless from obvious incorrect working)	4*n* + 7		A1 oe eg 7 + 4*n*
	(b)		*T* – "(4*n* + 7)"	1	B1ft oe, ft *T* – [their answer (a)]
					Total 3 marks

6	27.3 – 16.8 (= 10.5) **or** $7b + 2c = 27.3$ $4b + 2c = 16.8$ $3b = 10.5$		4	M1	for a correct first step to find the weight of 3 boxes
	"10.5" ÷ (7 – 4) (= 3.5) **or** $b = 3.5$			M1	for a method to find the weight of one box
	eg $27.3 - 7 \times "3.5" (= 2.8)$ **or** $16.8 - 4 \times "3.5" (= 2.8)$ **or** $2c = 16.8 - 4 \times "3.5" (= 2.8)$			M1	for a method to find the weight of 2 crates
	Correct answer scores full marks (unless from obvious incorrect working)	1.4		A1	oe eg $\frac{7}{5}$
					Total 4 marks

7	(a)		Reason given	1	B1	vertically opposite angles are equal **or** vertically opposite angles are equal opposite to 58(°)
	(b)	(*JGH* =) 360 – 163 – 90 – 47 (= 60) **or** (*JGH* =) 180 – 110 (= 70)		4	M1	for a method to find angle *JGH* either using the quadrilateral **or** assuming line *FGH* is straight
		Correct answer scores full marks (unless from obvious incorrect working)			A1	(110 + 60 =) 170 **or** 110 + 60 ≠ 180 **or** (180 – 60 =) 120 **or** (70 + 163 + 90 + 47 =) 370 **or** 70+ 163 + 90 + 47 ≠ 360 **or** for (180 – 110 =) 70 **and (**360 – 163 – 90 – 47 =) 60
					B1	angles on a straight line add to 180° **or** angles on a straight line add to 180°
					B1	angles in a quad(rilateral) add up to 360 **or** angles in a quad(rilateral) add up to 360 (Accept 4-sided shape)
						Total 5 marks

12	(a)		49.876(41697...)	2	B2	If not B2 then award B1 for 41.6(6...) **or** $\frac{125}{3}$ **or** $\frac{7.5}{0.18}$ **or** 8.2(0....)
	(b)		50	1	B1	ft from (a) provided 2 or more sig figs
						Total 3 marks

13		360 ÷ 24 $(n - 2)180 = (180 - 24)n$		2	M1	A fully correct method to find the number of sides of the polygon or correct use of formula with use of 24
			15		A1	
						Total 2 marks

International GCSE Maths						
Apart from Q2 (where the mark scheme states otherwise) the correct answer, unless obtained from an incorrect method, should be taken to imply a correct method.						
Question		**Working**	**Answer**	**Mark**	**Notes**	
1	(a)		Nine thousand two hundred and eighty	1	B1	
	(b)		New York	1	B1	
	(c)		700	1	B1	
	(d)		Kolkata	1	B1	
	(e)		17 000	1	B1	
						Total 5 marks

2	(a)		24	1	B1	
	(b)	26 – 16 (= 10)	10	2	M1 A1	
	(c)		One and half naan breads drawn	1	B1	
	(d)	24 + 20 + 16 + 26 + 12 (= 98) or 12 × 8 + 2 (= 98)	No and 98 seen	2	M1 A1	Must see "No" or "Not correct", "Wrong" etc.
						Total 6 marks

3	(a)		Obtuse	1	B1	
	(b)		Octagon	1	B1	
						Total 2 marks

4	(a)		Marked at 0	1	B1	
	(b)		Marked at 0.5	1	B1	
						Total 2 marks

International GCSE Maths A January 2020 – Paper 2FR Mark scheme						
Apart from Questions 12d and 21, where the mark scheme states otherwise, the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method.						
Question		**Working**	**Answer**	**Mark**		**Notes**
1	(a)		70 216	1	B1	cao
	(b)		1, 2, 5 or 10	1	B1	Any of these values with no other incorrect value
	(c)		25 or 36	1	B1	One or both of 25 or 36 and no other incorrect value
	(d)		15	1	B1	
	(e)		$42 - 6 \div (6 - 3)$	1	B1	Allow 42 – (6 ÷ (6 – 3))
						Total 5 marks
2	(a)		Frequencies and tallies of 2, 3, 8, 4, 5, 2	2	B2	All frequencies and tallies correct B1 for 3, 4 or 5 frequencies or tallies correct NB. Frequencies and tallies must be in the correct column. Accept 2/24 etc. in frequency column
	(b)		3	1	B1ft	Follow through from table
	(c)		Sensible statement	1	B1	Not enough 1's or 6's Too many 3's Rolled a 3 a third of the times Should expect to get 4 of each number
						Total 4 marks
3	(a)		An acute angle drawn at *A*	1	B1	
	(b)		Diameter drawn	1	B1	Diameter should not extend significantly beyond circumference.
						Total 2 marks

3	(a)		cylinder	1	B1 allow circular prism
	(b)		12	1	B1
					Total 2 marks

4	(a)		34	1	B1
	(b)		18	1	B1
					Total 2 marks

5	(a)		64	1	B1
	(b)		0.45	1	B1
	(c)		$\frac{3}{8}$	1	B1
	(d)		$2\frac{3}{4}$	1	B1
	(e)		square	1	B1
					Total 5 marks

6	24 ÷ 4 (= 6) **or** width = 24		3	M1 Could be clearly shown on diagram.
	10 × '6' oe **or** 24 + 24 + 6 + 6 oe			M1 dep M1
		60		A1 SC if no other marks scored B1 for 24 × 4 (= 96)
				Total 3 marks

11	(a)					CF, CL, CM, FL, FM, LM	2	B2 for all 6 combinations with no extras of repeats (B1 for at least 3 correct combinations (ignoring repeats))
	(b)		**Chocolate**	**Mint**	**Vanilla**	**Total**	Correct two-way table	2	B2 for all 4 correct values (B1 for 2 or 3 correct values)
		Saturday	**32**	11	28	**71**			
		Sunday	**16**	20	13	49			
		Total	48	31	41	**120**			
	(c)						$\frac{67}{100}$	1	B1 oe
									Total 5 marks

12	eg $360 \div 15$ or $\frac{(n-2)\times 180}{n} = 180 - 15$		2	M1
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	24		A1
				Total 2 marks

Question		Working	Answer	Mark	Notes
3	i		(triangular) prism	1	B1
	ii		5	1	B1
	iii		6	1	B1
4	a		6.5	1	B1
	b		8000	1	B1
	c	6 × 1000 (=6000) **or** 475 ÷ 1000 (=0.475) 6 × 1000 ÷ 475 **or** 6 ÷ (475 ÷ 1000) **or** 12.6(3…) **or** 475 × 12 (=5700) **or** 475 × 13 (=6175)	12	3	M1 M1 or for repeated subtraction of 475 from 6000 **or** repeated addition of 475 (may work in grams or kg) A1 cao SC : B2 for an answer of 13
5	a		$11x$	1	B1
	b		$20ef$	1	B1
	c		3	1	B1
	d		17	1	B1
	e		$7t + 6d$	2	B2 B1 for $7t$ **or** (+) $6d$

IGCSE Maths - Paper 1FR (1-9) 2018 June Mark scheme

The correct answer, unless clearly, obtained by an incorrect method, should be taken to imply a correct method with the exception of Q24

Question		Working	Answer	Mark	Notes
1	a		African buffalo	1	B1 accept buffalo or 725
	b		100	1	B1 accept (one) hundreds
	c		1192	1	B1 accept −1192
	d	800 × 20 ÷ 1000	16	2	M1 ft for any number in the table A1
2		70 + 100 + 70 + 100 = 340 "340" × 3	1020	3	M1 for working out the perimeter M1 dep on first M mark A1
3	a		$\frac{4}{15}$	1	B1 Do not accept 4:15 but accept 4/15
	b		4 squares shaded	1	B1
4	a		R marked	1	B1
	b		Trapezium	1	B1
	c		65	1	B1 accept answer in the range 63 – 67

Question		Working	Answer	Mark	Notes
7	(a)		(pentagonal) prism	1	B1
	(b)		7	1	B1
	(c)		15	1	B1
					Total 3 marks

8	(a)		6 45 am	1	B1	
	(b)		3 hr 45 mins	2	M1 A1	Attempt to count on from 0725to 0800 or to count from 0725 to 1025 oe
						Total 3 marks

9	(a)		2	1	B1	
	(b)	20 ÷ 2 (= 10th) or (20 + 1) ÷ 2 (=10.5th)	1	2	M1 A1	Or evidence of correct working by table or listing numbers
	(c)	(6×0) + (5×1) + ((7×2) + (1×3) + (0×4) + (1×5) (0) + 5 + 14 + 3 + (0) +5	27	2	M1 A1	For at least 4 correct products with intention to add.
						Total 5 marks

International GCSE Maths

Apart from question 9b, 9c (where the mark scheme states otherwise) the correct answer, unless obtained from an incorrect method, should be taken to imply a correct method.

Question		Working	Answer	Mark	Notes
1	(a)		3 or 19 or 51 or 81	1	B1
	(b)		24 or 60	1	B1
	(c)		16 or 81	1	B1
	(d)		3 or 19	1	B1
					Total 4 marks

2	(a)		5	1	B1
	(b)		60	1	B1
	(c)		1000	1	B1
					Total 3 marks

16	Ext ∠ = 180 – 162 (= 18) oe **or** $\frac{(n-2)180}{n}=162$ oe		3	M1
	360 ÷ "18" oe **or** 18*n* = 360			M1
		20		A1
				Total 3 marks

17 (i)		12, 18	1	B1
(ii)		12, 14, 15, 16, 18, 20	1	B1
(iii)		11, 13, 15, 17, 19	1	B1
				Total 3 marks

14		Rotation 180° and (0, 0)	2	B1	Rotation (with none of reflection, translation, enlargement, mirrored, flipped or moved stated)
				B1	180° centre (0, 0) or *O* (award if no vector or equation of line or SF mentioned) (B2 for enlargement SF −1 centre *O*)
					Total 2 marks

15	180 – 140 (= 40) **or** 180(n – 2) = 140n oe		3	M1	Correct method to find exterior angle or correct substitution into formula
	360 ÷ '40' **or** 40n = 360 oe			M1	
		9		A1	
					Total 3 marks

Question	Working	Answer	Mark	Notes
26	180 – 2 × 66 (= 48) (360 – "48") ÷ 2 (= 156) 180 – "156" (= 24) 360 ÷ "24"		3	M1 M1
	Alt : 180 – 2 × 66 (= 48) 360 ÷ (0.5 × "48")			M1 M1
		15		A1
				Total 3 marks

				Total : 100 marks

26	e.g. $\frac{3}{"10"}\times 80(=24)$ **or** $\frac{2}{"10"}\times 80(=16)$ **or** $\frac{5}{"10"}\times 80(=40)$		5	M2	for a complete method to find the number of chocolate cakes **or** lemon cakes **or** fruit cakes "10" comes from 3 + 2 + 5
				(M1	for correct use of the ratio e.g. 80 ÷ "10" (= 8))
	e.g. "16" × $\frac{3}{4}$ × 1.7(0) (= 20.4(0)) **or** "40" × $\frac{7}{8}$ × 2.4(0) (= 84)			M1	for a method to find the profit for lemon cakes **or** fruit cakes
	e.g. "24" × 2 (= 48) **and** "16" × $\frac{3}{4}$ × 1.7(0) (= 20.4(0)) **and** "40" × $\frac{7}{8}$ × 2.4(0) (= 84)			M1	for a method to find the profit for all 3 cakes
		152.4(0)		A1	
				Total 5 marks	

27	(Interior angle of octagon =) 180 – (360 ÷ 8) (= 135) **or** $\frac{(8-2)\times 180}{8}(=135)$ oe **OR** (exterior angle of octagon =) 360 ÷ 8 (=45)		3	M1	correct method to find interior or exterior angle of octagon (if labelled incorrectly do not award mark)
	e.g. $\frac{(8-2)\times 180}{8}(=135)$ **and** (180 – "135") ÷ 2 (=22.5) **OR** 360 ÷ 8 (= 45) **and** "45" ÷ 2 (= 22.5)			M1	correct method to find interior angle of hexagon and base angle of triangle.
		112.5		A1	
				Total 3 marks	

International GCSE Maths					
Apart from questions 11, 15, 19 and 22b the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method.					
Q		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		Tonga	1	B1 cao
	(b)		5 hundred(s)	1	B1 for 5 hundred(s) or 500
	(c)		four thousand, four hundred and thirty seven	1	B1 all numbers must be as words
	(d)		8458	1	B1 cao
	(e)	8047 + 2864		2	M1 for 'any value from table' + 2864
			10 911		A1 cao
					Total 6 marks

2	(a)		sphere	1	B1
	(b)		12	1	B1 cao
	(c)		10	1	B1 cao
					Total 3 marks

11	[interior angle of pentagon =] 540 ÷ 5 (= 108) oe or [exterior angle of pentagon =] 360 ÷ 5 (= 72)		3	M1	for a correct calculation for an interior or an exterior angle of a regular pentagon
	360 – (90 + "108") or 90 + "72" or 180 – ("108" – 90) oe			M1	for a fully correct method "108" or "72" must come from correct working and be used correctly
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	162		A1	
					Total 3 marks

7	(465 – 400) × 0.10 (= 6.5) or 65 × 0.10 (= 6.5)		4	M1	
	(1740 – 1500) × 0.05 (= 12) or 240 × 0.05 (= 12)			M1	
	20.75 + '6.5' + '12'			M1	
	Correct answer scores full marks (unless from obvious incorrect working)	39.25		A1	cao
					Total 4 marks

8	(360 – 122 – 122) ÷ 2 or 180 – 122		3	M1	
		58		A1	for 58°
		58 and correct reason		B1	dep on M1for a reason for their method used **allied** or **co-interior** angles add up to **180°** or **corresponding** angles are **equal** (angles on a **straight line** add up to **180°)** or **opposite angles** in a **rhombus** are **equal** or angles of a **rhombus/quadrilateral** add up to **360°**
					Total 3 marks

International GCSE Maths					
Apart from Questions 5b and 24 the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method					
Q		**Working**	**Answer**	**Mark**	**Notes**
1	(a)(i)		10 or 28	1	B1 accept 10 **or** 28 **or** 10 and 28
	(ii)		27	1	B1
	(iii)		23	1	B1
	(b)(i)		3578	1	B1
	(ii)		57 + 38 **or** 37 + 58	1	B1
					Total 5 marks

2	(a)		Isosceles	1	B1
	(b)		Correct lines of symmetry drawn	1	B1 with no additional lines
	(c)		5	1	B1
					Total 3 marks

International GCSE Maths						
Apart from question 22, the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method						
Q		**Working**	**Answer**	**Mark**	**Notes**	
1	(a)		7534	1	B1	
	(b)	eg 3600 − 3574 **or** 3745 – 3600		2	M1	for 3600 – "number" or "number" – 3600 where "number" contains the digits 3,4,5,7. Must have attempted to evaluate this calculation
			26		A1	cao
						Total 3 marks

2	(a)		Pentagon	1	B1	
	(b)		acute angle clearly indicated with '*A*'	1	B1	allow either angle or both acute angles indicated
	(c)		reflex angle clearly indicated with '*R*'	1	B1	accept either the interior reflex angle, or any of the exterior reflex angles, if labelled outside of the shape with an arc
						Total 3 marks

3	(a)		18	1	B1	
	(b)(i)	eg 66 − 15 − 9 − 3 − "18" **or** 66 − (7.5 × "6") **or** 66 − 45		2	M1ft	ft their 18 from part (a)
			21		A1ft	ft their 18 from part (a) eg 66 – 15 – 9 – 3 – their answer to part (a)
	(ii)		$3\frac{1}{2}$ diagrams drawn	1	B1ft	follow through their 21 from (b)(i)
						Total 4 marks

4	(a)		$\frac{7}{10}$	1	B1	oe eg $\frac{70}{100}$
	(b)		15	1	B1	
	(c)	eg $35 \times 3 \div 5$ **or** 7×3 **or** $\frac{3}{5} \times 35$		2	M1	for a complete method
			21		A1	
						Total 4 marks

5	(a)		1	1	B1	or one line (only) on the diagram clearly indicated
	(b)		2	1	B1	
	(c)		126	1	B1	allow ± 2
						Total 3 marks

6	(a) (i)		27	1	B1	
	(ii)		5, 16	1	B1	either or both indicated
	(b)	5 or 23 identified as a prime **or** 5 + 23		2	M1	at least one prime identified
			28		A1	
						Total 4 marks

7	(a)		(−1, 3)	1	B1	
	(b)		(5, 1)	2	B1 B1	for $x = 5$ for $y = 1$
	(c)	$\frac{1}{2} \times 6 \times 4$ oe		2	M1	for a correct method
			12		A1	
	(d)		*D* indicated at (−1, −1)	1	B1	label not required if coordinate clearly indicated
						Total 5 marks

International GCSE Maths

Apart from Questions 5, 18, 20, 22 the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method

Q		Working	Answer	Mark	Notes
1	(a)		7, 58, 123, 180, 202	1	B1
	(b)		0.015, 0.15, 0.155, 1.15, 1.5	1	B1
	(c)		5203	1	B1
	(d)		tens	1	B1 oe eg 6 tens, 60, ten(s), sixty,
					Total 4 marks

2	(a)		Bar drawn of height 8	1	B1
	(b)		USA	1	B1
	(c)		France	1	B1
	(d)		13	1	B1 Allow 13 000 000
					Total 4 marks

3	(a)		3.76	1	B1
	(b)		Arrow pointing at 0.04	1	B1
	(c)		5.7	1	B1 Allow 5,7
					Total 3 marks

4	(a)		Parallelogram drawn	1	B1
	(b)(i)		Pyramid	1	B1 accept square based pyramid or rectangular based pyramid
	(ii)		5	1	B1 Allow five
					Total 3 marks

19	3 × 180 (= 540) or 360 – [(180 – 90) + (180 – 135) + (180 – 67) + (180 – 119)] (= 51) or 360 – (90 + 45 + 113 + 61) (= 51)		3	M1
	90 + 135 + 67 + 119 + x = “540” oe 411 + x = “540” oe or “540” – (90 + 135 + 67 + 119) or 3 × 180 – (90 + 135 + 67 + 119) oe or 540 – 411 or 180 – “51” oe			M1
	Correct answer scores full marks (unless from obvious incorrect working)	129		A1
				Total 3 marks

20	2 : 3 : 15 oe or 20 or (1 : 5) × 3 or (1 : 5 =) 3 : 15 or 2n : 3n : 15n e.g. 4 : 6 : 30 or G(reen) = 2, O(range) = 3 , Y(ellow) = 15		3	M1
	$\frac{2}{\text{"20"}}$ × 280 oe or 14 × 2 or $\frac{2}{\text{"2"+ "3"+ "15"}}$ × 280 oe or $\frac{2n}{\text{"2}n\text{"+ "3}n\text{"+ "15}n\text{"}}$ × 280 oe			M1
	Correct answer scores full marks (unless from obvious incorrect working)	28		A1 or 28 : 42 : 210 or 28 , 42 , 210 If not in this order must be labelled correctly
				Total 3 marks

3	(a)		Pentagon	1	B1	
	(b)		7.6	1	B1	accept 7.4 – 7.8
	(c)		*T* marked at interior angle *E* **or** exterior angle *C*	1	B1	must be the interior angle at *E* or exterior angle at *C*. Allow both angles to be marked but no others. Allow *t*
						Total 3 marks

4	(a)		16 squares shaded	1	B1	cao
	(b)		70	1	B1	cao
	(c)		0.049, 0.14, 0.4, 0.459, 0.49	1	B1	oe
						Total 3 marks

5	(a)		(2, 3)	1	B1	
	(b)		For the point (6, 1) marked	1	B1	If not marked *D* then award marks so long as unambiguous.
	(c)		(3.5, 1)	2	B2	oe for both coordinates correct (B1 for a correct calculation for one coordinate $\frac{2+5}{2}$ or $\frac{3+-1}{2}$ or for one correct coordinate or for (1, 3.5))
	(d)		line drawn	1	B1	horizontal line drawn – any length as long as unambiguous
						Total 5 marks

6	(a)		Octagon	1	B1	
	(b)		8.6	1	B1	allow in range 8.4 – 8.8
	(c)		B, D	1	B1	both given
					Total 3 marks

7	(i)		unlikely	1	B1	Award unlikely together with a fraction. Accept incorrect spelling if meaning is clear
	(ii)		evens	1	B1	
	(iii)		impossible	1	B1	
						Total 3 marks

27	eg (*DEK* =) $\frac{360}{9}$ **or** 40 **or (**interior angle =) $\frac{(9-2)\times 180}{9}$ **or** 140 **or** *OFK* = 140 ÷ 2 (= 70) **or** *FOK* = $\frac{2}{9}\times 360$ (= 80) **or** *EDK* = 180 – 0.5 × 140 (=110) Angles marked correctly (any exterior or interior angle) gains this mark		3	M1 method to find interior or exterior angle or correct interior or exterior angle stated or shown correctly on diagram or for using 70° for *OFK* or 80° for *FOK* or 110 for *EDK* If a student has only found an interior or exterior angle and has clearly mixed up interior and exterior angles this mark cannot be awarded but can still be awarded for any of the other angles stated
	EDK = 110 and *DEK* = 40 or *FOK* = 80 and *OFK* = 70 or *ODE* = 70 and *DEK* = 40 or *FED* = 140 and *EDK* = 110 oe			M1 For two correct angles that can lead directly to the answer in a single step (eg 180 – both angles or one angle minus the other)
	Correct answer scores full marks (unless from obvious incorrect working)	30		A1
				Total 3 marks

International GCSE Maths

Apart from Questions 17 and 22a the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method

Values in quotation marks must come from a correct method previously seen unless clearly stated otherwise.

Q		Working	Answer	Mark	Notes
1	(a)		5, 39, 71, 122, 150	1	B1
	(b)		0.074, 0.13, 0.37, 0.7, 3.77	1	B1
	(c)		5084	1	B1
	(d)		3 hundreds	1	B1 accept 300, hundreds
					Total 4 marks

2	(a)		Bar drawn of height 44	1	B1
	(b)		North America	1	B1
	(c)		Asia	1	B1
	(d)		68	1	B1
					Total 4 marks

3	(a)		57.6	1	B1
	(b)		Arrow pointing at 240	1	B1
	(c)		0.79	1	B1
					Total 3 marks

4	(a)		kite	1	B1
	(b)(i)		Prism	1	B1 accept triangular prism
	(ii)		9	1	B1
					Total 3 marks

Question	Working	Answer	Mark	Notes
23	$160^2 + 200^2$ (=65600) $\sqrt{160^2 + 200^2}$	 256	3	M1 M1 A1 accept 256 – 256.2
				Total 3 marks

24	Interior angle of pentagon (180 × 3) ÷ 5 (= 108) oe Interior angle of octagon (180 × 6) ÷ 8 (= 135) oe (*CBF* =) 360 – ("108" + "135") (= 117)	 31.5	4	M1 or exterior angle of pentagon = $\frac{360}{5}$ (= 72) or exterior angle of octagon = M1 $\frac{360}{8}$ (= 45) M1 (*CBF* =) "72" + "45" (= 117) A1
				Total 4 marks

Question	Working	Answer	Mark	Notes
23	360 ÷ 8 (= 45) or 180 – (360 ÷ 8) (= 135) or $\frac{6\times180}{8}$ (=135) oe e.g. $\frac{540-112-112-84}{2}$ (=116) or $\frac{540-308}{2}$ (= 116) or $\frac{232}{2}$ (= 116) e.g. '135' – '116' or 180 – '116' – '45'	19	4	M1 Correct method to find the interior or exterior angle of octagon M1 Correct method to find a missing angle from pentagon M1 Complete method A1
24	1 + 0.65 + 1.22 (=2.87) or 100 + 65 + 122 (=287) 861 ÷ 2.87 or (861 ÷ 287) × 100 oe	300	3	M1 oe Note: 863÷3=287 is M0 M1 A1
25 (a)		$4d^2e(3+4e)$	2	B2 B1 for correct partial factorisation with at least one correct factor
(b)		$3k^3m$	2	B2 B1 for an answer in the form ak^xm^y with 2 correct from $a = 3$, $x = 3$, $y = 1$

3	(a)		Diameter	1	B1
	(b)		Chord	1	B1
	(c)		Sector shaded	1	B1 accept the semicircle shaded
					Total 3 marks

4	(a)		A	1	B1
	(b) (i)		D	1	B1
	(ii)		3	1	B1
	(c)		Octagon	1	B1 accept regular octagon
					Total 4 marks

5	(a)		$\frac{16}{20}$	1	B1
	(b)		12 squares shaded	1	B1
	(c)		80	1	B1
	(d)	48 ÷ 4 × 5 **or** 48 × 5 ÷ 4 **or** 48 ÷ 0.8 **or** 48 × 1.25 oe			M1 for a complete method
			60	2	A1
					Total 5 marks

International GCSE Maths				
Apart from questions 15, 17b, 20, 24 (where the mark scheme states otherwise) the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method				
Q	**Working**	**Answer**	**Mark**	**Notes**
1 a		8632	1	B1 cao
b		24	1	B1 cao
c		17	1	B1 cao
				Total 3 marks

2	a	5 − 9			M1
			−4	2	A1
	bi		4	1	B1
	bii	−7, −6, −5, −1, 0, 4, 4			M1 for writing the values in the correct order, condone one error or omission **or** for an answer of 0
			−1	2	A1
					Total 5 marks

3	a		Kite drawn	1	B1
	b		Octagon	1	B1
	ci		Cuboid	1	B1
	cii		8	1	B1
					Total 4 marks

4	(a)		pentagon	1	B1	
	(b)		85	1	B1	for 83 – 87
	(c)		parallel sides marked	1	B1	No additional sides marked
	(d)		No with reason	1	B1	No and, for example, 12 ÷ 4 = 3 but 5 ÷ 3 does not equal 3
						Total 4 marks

5	20 – 2.35 (=17.65)		3	M1	
	'17.65' ÷ 0.74 (= 23.8…) **or** 24			M1	A clear attempt to subtract 0.74 23 times
		23		A1	
					Total 3 marks

21	(10 – 2) × 180 oe (= 1440) **or** (6 – 2) × 180 oe (= 720)		4	M1	for a method to find the sum of the interior angles of a decagon or a hexagon
	'1440' – 148 – 2×150 – 2×168 – 2×134 – 2×125 (=138) **or** '1440' – 1302 (= 138) **or** '720' – 148÷2 – 150 – 168 – 134 – 125 (= 69) **or** '720' – 651 (= 69)			M1	Allow omission of one angle
	360 – '138' **or** 360 – 2 × '69'			M1	
		222		A1	
	Alternative method (exterior angles)				
	360 – 2×(180 – 125) – 2×(180 – 134) – 2×(180 – 168) – 2×(180 – 150) – (180 – 148) **or** 360 – 2×55 – 2×46 – 2×12 – 2×30 – 32		4	M2	If not M2 then award M1 for at least 3 or (180 – 125) , (180 – 134) , (180 – 168) , (180 – 150), (180 – 148) **or** at least 3 of 55, 46, 12, 30, 32
	180 + '42'			M1	
		222		A1	
					Total 4 marks

22	E.g. 1 − 0.2 (= 0.8) **or** 100(%) − 20(%) (= 80(%)) **or** $\frac{1080}{80}$ (= 13.5) oe		3	M1
	E.g. 1080 ÷ 0.8 or 1080 ÷ 80 × 100 or '13.5' × 100 1080 × 100 ÷ 80			M1 for a complete method
		1350		A1
				Total 3 marks

International GCSE Maths				
Apart from questions 15c, 17, 25 (where the mark scheme states otherwise) the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method				
Q	**Working**	**Answer**	**Mark**	**Notes**
1 a		Makalu	1	B1 Accept 8485
b		Five thousand eight hundred and ninety five	1	B1
c		800	1	B1 Accept 8 (eight) hundreds, hundreds, 100('s),
d		2077	1	B1 Accept −2077
				Total 4 marks

2	ai		likely	1	B1
	aii		impossible	1	B1
	b		cross at $\frac{1}{2}$	1	B1
	c		cross at $\frac{1}{6}$	1	B1
					Total 4 marks

3	a		Trapezium	1	B1
	b		42	1	B1 Accept 40 – 44
	c		Correct lines marked	1	B1
	d		2	1	B1
					Total 4 marks

26	$\frac{360}{10}$ (= 36) ext angle **or** $\frac{(10 - 2)\times 180}{10}$ **(=** 144)		4	M1	method to find interior or exterior angle. (angles may be seen on diagram)
	$x =$ "144" – 90 (= 54) or $x = \frac{"540" - 3\times "144"}{2}$ (=54) or $x = 90 - "36"(=54)$ 54 on the diagram is insufficient – must see working			M1	method to find x (must show it is intended to be x) eg use of int angle – 90º use of ext angle + x = 90º use of pentagon *GHIJA* All figures in " " must come from correct working
	$BAD = CDA = GDE = DGF = \frac{360 - 2\times "144"}{2} (= 36)$			M1	A correct method to find an angle of 36º within the shape (not exterior angle) or 36º shown in correct place in diagram
	There are other correct methods. Please check for correct working.	x = 54 y = 54		A1	dep on M3 to find each of x and y and the correct value of 54 for both from correct working
					Total 4 marks
ALT	*ADG* = "144" – 2 × "36" (= 72)			M1	
	JA is parallel to *GD*			M1	
	DGA = *DAG* (*y*) [isosceles triangle]			M1	
	x = *DGA* = y	shown		A1	
	There are other correct methods. Please check for correct working.				**Total 4 marks**

7	(a)	21 : 48		2	M1 or 16 : 7
			7 : 16		A1 cao
	(b)		$\frac{11}{15}$	1	B1 oe exact fraction
					Total 3 marks

8	0.14 × 350 (= 49)		3	M1
	'49' + 25 or 0.14 × 350 + 25			M1
		74		A1
				Total 3 marks

9	(i)	360 – (92 + 44) (= 224) oe **or** 92 + 44 + x + x = 360 oe		3	M1
		'224' ÷ 2 or 2x = '224' oe			M1
			112		A1
	(ii)		Correct reason	1	B1 dep on M1 for a correct reason Angles in a quadrilateral sum to 360^o (accept Angles in a quadrilateral sum to 360^o)
					Total 4 marks

21	360 ÷ 8 (= 45) or 360 ÷ 5 (= 72) or 180 – (360 ÷ 8) (= 135) oe or 180 – (360 ÷ 5) (= 108) oe		4	M1 finding interior or exterior angle of octagon or pentagon Angles may be seen on diagram – but must be obtuse if interior and acute if exterior.
	'72' – '45' (= 27) or '135' – '108' (= 27)			M1 (dep 1st M1) using a pair of interior or pair of exterior angles to find angle *IBC* Angle may be seen on diagram.
	$\frac{180 - '27'}{2}$ (= 76.5)			M1
		76.5		A1
				Total 4 marks

22	7200 × 0.025 (= 180) or 7200 × 1.025 (= 7380) oe or 7200 × 1.075 (= 7740) oe or 7200 × 0.075 (= 540) oe		3	M1	M2 for $7200 \times (1.025)^3$
	(7200 + '180') × 0.025 (= 184.5) and (7200 + '180' + '184.5') × 0.025 (= 189.1125) and 7200 + '180' + '184.5' + '189.1…' (= 7753.6125)			M1 NB year end values are 7380 and 7564.5(0) 7753.6125	
		7754		A1 answer in range 7753 – 7754	
				Total 3 marks	

19	$7x + 3x + 8x = 360$ oe		4	M1	M2 for $7x = 140$
	$(x =)\ 360 \div 18\ (= 20)$			M1	(140 can be on diagram)
	$360 \div (180 - 7 \times$ "20") oe or $360 \div (180 -$ "140") $\frac{(n-2)\times 180}{n} = 7 \times$ "20" oe or $360 \div 40$			M1 for $360 \div$ exterior angle	
		9		A1	
				Total 4 marks	

20	(a)	$n^2 - 6n + 4n - 24$		2	M1 for any 3 correct terms **or** for 4 out of 4 correct terms ignoring signs **or** for $n^2 - 2n \ldots$ **or** for $\ldots - 2n - 24$
			$n^2 - 2n - 24$		A1 oe
	(b)	$8x - 12$ **or** $\frac{3}{4}x - \frac{5}{4}$ oe or $0.75x - 1.25$ oe		3	M1 for correct multiplication by 4 **or** separate fractions on the RHS
		$8x - 3x = -5 + 12$ oe or $5x = 7$ oe **or** $2x - \frac{3}{4}x = -\frac{5}{4} + 3$ or $2x - 0.75x = -1.25 - 3$ oe			M1 ft (dep on 4 terms) for terms in x on one side of equation and number terms on the other
			$\frac{7}{5}$		A1 oe dep on M1 1.4 or $1\frac{2}{5}$ oe
					Total 5 marks

International GCSE Maths					
Apart from Questions 13, 14d, 15, 25 the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method					
Q		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		84, 105, 171, 233, 490	1	B1
	(b)		5102	1	B1
	(c)		3 tens	1	B1 accept 30, tens
	(d)		700	1	B1
					Total 4 marks

2	(a)		40	1	B1
	(b)		USA	1	B1
	(c)		95	1	B1
	(d)		Bar drawn height 25	1	B1
					Total 4 marks

3	(a)		Octagon	1	B1
	(b)		Acute	1	B1
	(c)		Chord drawn	1	B1
	(d)		360	1	B1
					Total 4 marks

24	eg $\pi \times 3^2 \times 7$ (= 63π or 197.9…)		3	M1	for method to find the volume of Solid **A**
	eg $\frac{2000}{[\text{vol A}]}$ **or** $\frac{3375}{450}$ (= 7.5 oe) **or** $\frac{2000+3375}{[\text{vol A}]+450}$			M1	(indep) for method to find the density of Solid **A**, **B** or **C,** allow use of their volume for Solids **A** and **C**
	Correct answer scores full marks (unless from obvious incorrect working)	8.3		A1	accept 8.29 – 8.31
					Total 3 marks

25	*SCD* = 128° **or** *BCS* = 32° **or** *TSC* = 180 – 128 (= 52)		4	M1	angles need to be identified or may be seen marked on the diagram	M2 for (*BCD* =) 128 + 32 (= 160) **or (***DCV* =) 52 – 32 (= 20) (may be seen marked on the diagram). To award these marks 160 or 20 must be clearly used or identified as the interior or exterior angle.
	eg (int∠ =)128 + 32(= 160) **or** (ext∠ =)180 – (128 + 32)(= 20) **or** (ext∠ =)"52" – 32(= 20)			M1	(dep on previous M1) for method to find the size of one interior or exterior angle, may be seen marked on the diagram.	
	eg 180(n – 2) = "160"n **or** 360 ÷ "20"			M1	for setting up an equation for the sum of interior angles **or** 360 ÷ "20"	
	Working required	18		A1	dep on M2	
						Total 4 marks

19	$(4x - 27) + (3x + 46) = 180$ oe or "expression for C" + $(3x + 10) = 180$ **or** $7x + 19 = 180$ **or** $3x + 46 + 4x - 27 + 3x + 10 + [\text{"}180 - (3x + 10)\text{"}] = 360$		4	M1	Sum angles *A* and *B* to 180, or find an expression for *BCD* and sum all angles to 360. [condone missing brackets and condone use of any letter for angle *C* (even *x* or *BCD*)]
				A1	$x = 23$
	eg $3 \times$"23" + 46 (= 115) **or** eg $180 - (3 \times$"23" + 10) (= 101)			M1ft	dep on M1 using **their *x*** to calculate a value for angle *B* or *C* (cannot be a negative value and cannot just be *x*)
	Correct answer scores full marks (unless from obvious incorrect working)	115		A1	Allow $3x + 46$ or *ABC* if 115 is clearly seen in working or on diagram
					Total 4 marks

International GCSE Maths					
Where the mark scheme states otherwise, the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method					
Q		**Working**	**Answer**	**Mark**	**Notes**
1	(a)(i)		20	1	B1 cao
	(ii)		25	1	B1 cao
	(b)(i)		cube	1	B1 ignore misspelling
	(ii)		factor	1	B1 ignore misspelling
					Total 4 marks

2	(a)		8	1	B1 cao
	(b)		Correct shape drawn	1	B1
	(c)		2	1	B1 cao
	(d)		240	1	B1 cao
					Total 4 marks

3	(a)		Neptune	1	B1 cao allow −210
	(b)		630	1	B1 allow −630
					Total 2 marks

4	(a)(i)		(2, 6)	1	B1 cao
	(ii)		(−4, 3)	1	B1 cao
	(b)		Cross at (4, 2)	1	B1 cao
					Total 3 marks

International GCSE Maths					
Apart from questions 11, 13, 16b and 24 (where the mark scheme states otherwise) the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method					
Q		**Working**	**Answer**	**Mark**	**Notes**
1	(a)(i)		40	1	B1 cao
	(ii)		27	1	B1 allow 3^3
	(b)		–9	1	B1 cao
	(c)		21	1	B1 cao
	(d)		2 + odd prime number	1	B1 eg. 2 + 3, 2 + 5 etc
					Total 5 marks

2	(a)		Canada	1	B1
	(b)		420	1	B1 cao
	(c)		90	1	B1 cao
	(d)		Correct bar chart	1	B1 Allow ± half square tolerance for height of bar
					Total 4 marks

3	(a)		reflex	1	B1
	(b)		radius	1	B1
	(c)		pentagon	1	B1
	(d)		9	1	B1 cao
					Total 4 marks

3	(a)		Cross at $\frac{1}{2}$	1	B1 cao
	(b)		Cross at 0	1	B1 cao
	(c)	Acceptable answers eg 1. It is over 1/more than 1 oe 2. It is over 100%/more than 100% oe 3. Probability of 1/100% is the highest oe 4. Probability ranges from 0 – 1 or 0 – 100% oe 5. 1.2/120% is impossible oe 6. It has to be 1 or less oe 7. It has to be below 1 oe Do not accept eg 1. It is (too) high oe 2. Sum has to be 1 oe This is not an exhaustive list	Correct reason	1	B1 for probability cannot be more than 1 oe Do not allow contradictory answers Any reference to **sum** of probabilities is 1 is B0
					Total 3 marks

4	(a)		octagon	1	B1
	(b)		240	1	B1
	(c)		C	1	B1 allow c
	(d)		metres	1	B1 or m
					Total 4 marks

19	1 + 0.15 (= 1.15) **or** x + 0.15x = 943 **or** 100(%) + 15(%) (= 115(%)) **or** $\frac{943}{115}$ (= 8.2) oe		3	M1
	943 ÷ "1.15" **or** 943 ÷ "115" × 100 **or** 943 × 100 ÷ "115" oe **or** 8.2 × 100			M1 dep on M1
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	820		A1
				Total 3 marks

20	(5 – 2) × 180 (= 540) **or** 360 ÷ 5 (= 72)		4	M1 NB If angles are on the diagram they must be from correct working and correctly assigned
	$\frac{"540"}{5}$ (= 108) or 180 – "72" (= 108) **or** 180 – 96 (= 84)			M1
	"72" + "84" **or** 360 – (96 + "108") **or** 180 – ("108" – "84")			M1 for a complete method
	Working required	156		A1 dep on M2
				Total 4 marks

6	(a)		8	1	B1	
	(b)		*R* marked at bottom left vertex	1	B1	accept a clear unambiguous right angle symbol instead of *R*
	(c)		*O* marked at bottom right vertex	1	B1	
	(d)		42	1	B1	Allow 40 – 44
						Total 4 marks

7	(a)	$72 \div 24\ (= 3)$ **or** $24 \div 72\ \left(= \frac{1}{3}\ \text{oe}\right)$ **or** $24 \div \frac{72}{360}(=120)$ **or** $96 \div 72\ \left(= \frac{4}{3}\ \text{oe}\right)$ **or** $72 \div 96\ \left(= \frac{3}{4}\ \text{oe}\right)$		2	M1	for a method to find the number of degrees per person **or** the number of people per degree **or** the total number of people represented by the pie chart **or** the scale factor between mahjong and chess
		Correct answer scores full marks (unless from obvious incorrect working)	32		A1	cao
	(b)	$72 \div 24 \times 40$ oe eg 3×40 **or** $40 \div (24 \div 72)$ oe eg $40 \div \frac{1}{3}$ **or** $\frac{40}{24} \times 72$		2	M1ft	some working may be seen in part (a) eg $72 \div 24\ (= 3)$
		Correct answer scores full marks (unless from obvious incorrect working)	120		A1	accept 119.5 – 120.3
						Total 4 marks

2	(a)(i)		Isosceles	1	B1 allow incorrect spelling
	(ii)		Square	1	B1 allow incorrect spelling
	(b)		Correct line	1	B1
	(c)		4	1	B1 cao
					Total 4 marks

3	(a)		16	1	B1 cao
	(b)	19 and 10 or –9 or 19 – x or y – 10		2	M1 Allow 19 and 10 seen on pictogram x and y are incorrect values
		Correct answer scores full marks (unless from obvious incorrect working)	9		A1 SC B1 for 3 or 6 with or without seeing the figures on the pictogram
	(c)		Three large squares and one small square	1	B1 oe eg 13 small squares
					Total 4 marks

4	(a)		70	1	B1 cao
	(b)		15	1	B1 cao
	(c)		7000	1	B1 allow −40
					Total 3 marks

International GCSE Mathematics Values in quotation marks must come from a correct method previously seen unless clearly stated otherwise.					
Q		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		725	1	B1 cao
	(b)		32	1	B1 cao
	(c) (i)		4578	1	B1 cao
	(ii)		8754	1	B1 cao
					Total 4 marks

2	(a)		24	1	B1 cao
	(b)	"24" + 32 + 42 + 28 or 15 × 8 + 4 + 2 oe		2	M1 ft their "24", allow one error or omission in adding values
			126		A1 cao
	(c)		2 and ¾ circles	1	B1 oe eg 2 and ½ and ¼ circles
					Total 4 marks

3	(a)		6	1	B1 cao
	(b)		8	1	B1 cao
	(c)		diameter	1	B1 accept chord, condone incorrect spelling
	(d)		tangent	1	B1 condone incorrect spelling
					Total 4 marks

4	(a)		20*e*	1	B1 allow *e*20
	(b)		15	1	B1 cao
					Total 2 marks

20	eg 360 – (148 + 50) (= 162) **or** 180 – 50 (= 130) **or** 180 – 148 (= 32)			4	M1 for method to find the interior angle of the polygon **or** start to the method of finding the exterior angle of the polygon
	eg 180 – "162" (= 18) **or** 148 – "130" (= 18) **or** 50 – "32" (= 18)	eg 180(n – 2) = "162"n **or** 180(n – 2) ÷ n = "162"			M1 for method to find the exterior angle **or** for setting up an equation using sum of interior angles formula
	eg 360 ÷ "18"	eg (n =) 360 ÷ (180 − "162")			M1 for a complete method
	Working required		20		A1 dep on M1
					Total 4 marks

21	(a)		12	1	B1	accept x^{12}
	(b)		5	1	B1	accept y^5
	(c)		$125a^{12}r^6$	2	B2	for $125a^{12}r^6$ (B1 for a product in the form ka^pr^q where 2 from k, p or q are correct eg $5a^{12}r^6$ Allow $125a^{12}$ or $125r^6$ or $a^{12}r^6$ so as long as not added to any other terms)
						Total 4 marks

International GCSE Maths					
Values in quotation marks must come from a correct method previously seen unless clearly stated otherwise.					
Q		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		Montana	1	B1
	(b)		314 200	1	B1
	(c)		4 thousands	1	B1 accept 4000, thousands
	(d)		420 727	1	B1
	(e)		Twenty three thousand, eight hundred (and) seventy one	1	B1
					Total 5 marks

2	(a)		unlikely	1	B1
	(b)		× at 1	1	B1
	(c)		2 numbers which are even	1	B1
					Total 3 marks

3	(a)		5.3 cm or 53 mm or 5cm 3mm	2	B2 for 5.3 cm or 53 mm or 5cm 3mm (allow 5.1 – 5.5 cm or 51 – 55 mm or 5cm 1mm – 5cm 5 mm) (B1 for 5.3 (allow 5.1 – 5.5) **or** 53 (allow 51 – 55) **or** cm with a value from 4.8 – 5.8 **or** mm with a value from 48 – 58)
	(b)		109	1	B1 (± 2)
	(c)		hexagon	1	B1
					Total 4 marks

International GCSE Mathematics					
Values in quotation marks must come from a correct method previously seen unless clearly stated otherwise.					
Q		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		46 83 99 148 229	1	B1 cao
	(b)		0.08 0.25 0.417 0.46 0.5	1	B1 cao
	(c)		$\frac{81}{100}$	1	B1 oe fraction
	(d)		0.25	1	B1 allow $\frac{1}{4}$ oe
					Total 4 marks

2	(a)		9	1	B1 cao
	(b)	2 4 6 7 9 9 10 **or** 10 9 9 7 6 4 2		2	M1 for ordering the numbers allow one error or one omission
		Correct answer scores full marks (unless from obvious incorrect working)	7		A1
	(c)		8	1	B1 cao
					Total 4 marks

3	(a)(i)		Cube	1	B1 allow misspelling, allow cuboid Allow prism or square prism or rectangular prism
	(ii)		12	1	B1 cao
	(b)		B and D	1	B1 allow D and B (or b and d etc)
	(c)		C	1	B1 allow c
					Total 4 marks

23	(5 – 2) × 180 ÷ 5 (= 108) **or** 360 ÷ 5 (= 72)		5	M1	for method to find an interior or exterior angle of a pentagon
	(6 – 2) × 180 ÷ 6 (= 120) **or** 360 ÷ 6 (= 60)			M1	for method to find an interior or exterior angle of a hexagon
	360 – 108 – 120 (= 132) **or** 60 + 72 (= 132) **or** (180 – '120') + (180 – '108')			M1	dep on M2 for a correct method to find angle *EDI* using correct figures
	360 – '72' – '60' – '132' (= 96)			M1	for a complete method to find angle *x*
		96		A1	dep on correct working
				Note:	Angles may be seen on diagram throughout
					Total 5 marks

24	a		$2^6 \times 3 \times 11^4$	2	B2	oe, accept 2 811 072
					B1	for $2^a \times 3^b \times 11^c$ oe where two of *a*, *b* and *c* are correct
	b		$2^9 \times 3^5 \times 11^8$	2	B2	cao
					B1	for $2^a \times 3^b \times 11^c$ oe where two of *a*, *b* and *c* are correct **or** $2.666... \times 10^{13}$ **or** an equivalent expression for e.g. $2^2 \times 2^7 \times 3^5 \times 11^3 \times 11^5$
						Total 4 marks

International GCSE Maths					
Apart from questions 8d, 15, 16, 18b, 22, 23 (where the mark scheme states otherwise) the correct answer, unless clearly obtained from an incorrect method, should be taken to imply a correct method.					
Question	**Working**	**Answer**	**Mark**	**Notes**	
1 (a)		Pacific	1	B1	Allow P or incorrect spelling so long as meaning is clear Allow 135 663
(b)		Seventeen thousand nine hundred [and] sixty eight	1	B1	Must be all in words – allow incorrect spelling as long as meaning is clear, eg thosand, hunded, hunder, etc
(c)		67 000	1	B1	or '67 thousand'
(d)		181 052	1	B1	cao
					Total 4 marks

Question	**Working**	**Answer**	**Mark**	**Notes**
2 (a)		4	1	B1 or 'four'
(b)(i)		54	1	B1 allow from 52 to 56 (inclusive) including decimals eg 52.5
(b)(ii)		Acute	1	B1 allow incorrect spelling as long as meaning is clear
(c)(i)		[Square based] Pyramid	1	B1 allow rectangular based pyramid or 'pyramid' allow incorrect spelling as long as meaning is clear
(c)(ii)		8	1	B1 or 'eight'
				Total 5 marks

21	$(5 - 2) \times 180 - 112 - 102 - 96$ (= 230) oe eg $540 - 112 - 102 - 96$ (= 230) **or** 360 – (180 – 112) – (180 – 102) – (180 – 96) (= 360 – 68 – 78 – 104 = 360 – 230 = 130) oe		5	M1
	$\frac{'540' - 112 - 102 - 96}{2}$ (= 115) **or** '130' ÷ 2 (= 65)			M1 dep on previous mark
	$\frac{180 \times (8-2)}{8}$ (= 135) **or** 180 – (360 ÷ 8) (= 135) **or** $\frac{360}{8}$ (= 45) as exterior angle of octagon			M1 indep Withhold the mark for $\frac{360}{8}$ (= 45) if shown as an interior angle
	360 – '115' – '135' **or** '65' + '45'			M1
	Working required	110		A1 dep on M1
				Total 5 marks

3	(a)		14 squares shaded	1	B1	any 14 squares shaded
	(b)		two tenths	1	B1	allow 'tenths' or $\frac{2}{10}$
	(c)		0.625	1	B1	
	(d)		2.008, 2.081, 2.8, 2.803, 2.83	2	B2 (B1	for all numbers in correct order for one number when covered leaves the others in order **or** for all numbers in correct reverse order)
						Total 5 marks

4	(a)		4.5 cm or 45 mm	2	B2 (B1	for 4.5 cm or 45 mm (allow 4.3 – 4.7 cm or 43 – 47 mm) for 4.5 (allow 4.3 – 4.7) **or** 45 (allow 43 – 47) **or** cm with a value from 4 – 5 **or** mm with a value from 40 – 50)
	(b)		29	1	B1	(± 2)
	(c)		the pair of parallel sides marked	1	B1	only 2 sides marked correctly
	(d)		pentagon	1	B1	
						Total 5 marks

International GCSE Maths					
Apart from Question 21, the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method					
Q		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		15	1	B1
	(b)		18	1	B1
	(c)		16	1	B1
	(d)		2	1	B1
	(e)		8 and 18	1	B1
					Total 5 marks

2	(a)		Unlikely	1	B1 Tick at
	(b)		Evens	1	B1 Tick at
	(c)		Impossible	1	B1 Tick at
					Total 3 marks

3	(a)		Prism	1	B1 Accept pentagon(al) prism
	(b) (i)		7	1	B1
	(ii)		10	1	B1
	(c)	±(70 − 8 × 5) or − 30 or 70 − 5 − 5 − 5 − 5 − 5 − 5 − 5 − 5 − 5 oe		2	M1 Could be done in 2 parts
		Correct answer scores full marks (unless from obvious incorrect working)	30		A1
					Total 5 marks

27	int angle of pentagon = (3 × 180) ÷ 5 (= 108) oe **or** ext angle of pentagon = 360 ÷ 5 (= 72) oe		5	M1	allow in working but not if labelled in wrong place on diagram (unless clearly started again)
	int angle of hexagon = (4 × 180) ÷ 6 (= 120) **or** ext angle of hexagon = 360 ÷ 6 (= 60)			M1	allow in working but not if labelled in wrong place on diagram (unless clearly started again)
	360 – (“108” + “120”) (= 132) oe **or** “60” + “72” (= 132) **or** $(180-"108")+(180-"120")$ (= 132)			M1	A fully correct method to find the size of angle *AEF* but not if labelled in wrong place on diagram [Figures in inverted commas must come from correct working]
	$[180-("60"+"72")]\div 2$ oe **or** $\frac{180-"132"}{2}$ oe **or** $[180-(180-"108")-(180-"120")]\div 2$ oe			M1	A fully correct method to find the size of angle *EAF* [Figures in inverted commas must come from correct working]
	Correct answer scores full marks (unless from obvious incorrect working)	24		A1	cao
					Total 5 marks

3	(a)		243	1	B1	cao
	(b)		Multiplying previous term by 3	1	B1	for multiplying previous term by 3 oe "×3" or 81×3
	(c)		19 683	1	B1	cao
						Total 3 marks

4	(a)		2.7	1	B1	condone 2.7 million
	(b)		Malaysia	1	B1	cao
	(c)		Correct bar drawn	1	B1	for correct bar at a height of 5.4 (within half small square) allow any bar width or location (no gap required) condone stick at correct height.
	(d)		Russia	1	B1	cao
						Total 4 marks

5	(a)		3.0 – 3.2	1	B1	for in the range 3.0 – 3.2
	(b)		Parallelogram	1	B1	allow trapezium
	(c)		2	1	B1	cao
	(d)		Correctly labelled	1	B1	Angle *DAB* or angle *DCB* or both labelled
	(e)	$\frac{1}{2}(6+10)\times 4$		2	M1	for correct application of formula allow triangle method
			32		A1	cao
						Total 6 marks

Apart from Questions 18 & 19 (where the mark scheme states otherwise), the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method.

Question		Working	Answer	Mark	Notes
1	(a)		$\frac{5}{25}$ $\frac{8}{40}$	2	B1 B1 B2 for 2 correct only. B1 for 1 correct only – 1 mark for each incorrect tick if more than 2 ticks
	(b)		Octagon	1	B1 Accept misspellings
	(c)		6 'sectors' shaded oe	1	B1 Shading equivalent to 6 sectors
	(d)	$\frac{56\times3}{4}(=\frac{168}{4})$ or $\frac{56}{4}\times3(=14\times3)$		2	M1
			42		A1
					Total 6 marks

2	(a)		Sevilla	1	B1 Accept misspellings
	(b)		66 000	1	B1
	(c)		600	1	B1 Accept in words ie 6 hundred(s), six hundred(s)
	(d)		2 : 3	1	B1 Allow 1:1.5
	(e)	$\frac{72}{100}$		2	M1 or $\frac{36}{50}$
			$\frac{18}{25}$		A1
					Total 6 marks

3	(a) (i)		kilometres	1	B1	Accept km or kms
	(ii)		litres	1	B1	
	(iii)		square cm	1	B1	Accept sq cm, square centimetres, cm^2 etc.
	(b)		1.8 → 2.2 metres	2	B2	B2 for 1800 → 2200 mm or 180 → 220 cm or 1.8 → 2.2 m If not B2, then B1 for metres, centimetres or millimetres
						Total 5 marks

4	(a) (i)		Sphere	1	B1	
	(a) (ii)		Cone	1	B1	
	(a) (iii)		Prism	1	B1	Accept hexagon prism or hexagonal prism
	(b) (i)		8	1	B1	
	(ii)		12	1	B1	
	(c)	54 ÷ (9 × 2)		2	M1	
			3		A1	
						Total 7 marks

Question	Working	Answer	Mark	Notes
17	180 + 149 **or** 360 − 31			M1
	Working not required, so correct answer scores full marks	329	2	A1
				Total 2 marks

Question		Working	Answer	Mark	Notes
18	(a)(i)	other seen orders of letters: a, b, d, e, i, l, n, r, z b, r, I, a, e, z, l, n, d	b, r, a, z, i, l, e, n, d	1	B1 no repeats, letters can be in any order. Condone capital letters rather than lower case letters. (no need for commas)
	(ii)		b, z	1	B1 No repeats, letters can be in any order. Condone capital letters. (no need for commas)
	(b)		correct explanation that shows they know the meaning of intersection and empty set	1	B1 eg letter 'a' is in both sets $B \cap K = \{a\}$ Set *B* and set *K* have an element (or letter) in common. There is a letter that is in set *B* and in set *K* There is an intersection so it isn't the null set There is a letter in common (do **not** allow 'letters' or 'elements' (plural) in common) (If students mention the letter that is in common, it must be the correct one (ie a))
					Total 3 marks

Question	Working	Answer	Mark	Notes
16*	180 + 73 or 360 – (180 – 73) or 360 – 107 or 270 – (90 – 73) or 270 – 17 or 270 – (180 – 90 – 73)		2	M1 or for 73 or for 107 or for 253 seen in the correct place on the diagram by point *B* or correctly identified by labelling
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	253		A1
				Total 2 marks

Question		Working	Answer	Mark	Notes
17*	(a)	12 ÷ 4 (= 3) or 50 ÷ 4 (= 12.5) oe		2	M1 for a correct method to find the SF or a correct calculation to find the amount of cheese for one person
		Working not required, so correct answer scores full marks (unless from obvious incorrect working)	150		A1
	(b)	180 ÷ 40 (= 4.5) oe or 40 ÷ 4 (= 10)		2	M1 for a correct method to find the SF or a correct calculation to find the amount of butter for one person
		Working not required, so correct answer scores full marks (unless from obvious incorrect working)	18		A1
					Total 4 marks

13	(a)		209	1	B1
	(b)			2	M1 For showing or stating NTR = 180 – 125 = 55°(where N is North at T) or SRT = 180 – 125 = 55° (where S is South at R) or RTS = 125°(where S is south of T) or NT(SE) = 125°(where N is north of T and SE is South-East of T) or for 360 – (180 – 125) or 180 + 125
			305		A1
					Total 3 marks

14	(a)	0.5 × (13.5 + 17) × 10.4	158.6	2	M1 for a complete method eg rectangle ±2 triangles
					A1 allow 159
	(b)	15.5 × 8 (=124) or 15.5 × 8 × x 15.5 × 8 × x = 806	6.5	3	M1
		806 ÷ "124"			M1 dep
					A1
					Total 5 marks

15	6 hrs 39 mins = 6.65 (hrs) or $6\frac{39}{60}$ or $6\frac{13}{20}$ or $\frac{133}{20}$ or 399 (mins)		3	B1
	Average speed = $\frac{429}{6.65}$ oe eg $\frac{429}{399}\times 60$			M1 Use of $S = D \div T$ (use of their time in hours) [Allow $\frac{429}{6.39}$ if B0 awarded]
		64.5		A1 awrt 64.5
				Total 3 marks

9	(a)		107	1	B1	Accept 105 → 109
	(b)	360 – 135 or 180 + 45		2	M1	
			225		A1	
						Total 3 marks

10	(a)	(60 ÷ 24) × 100 or $\frac{100}{24}\times 60$		2	M1	Complete method accept 4.16 × 60
			250		A1	cao
	(b)	$\frac{30-24}{24}(\times 100)$ oe or 30 ÷ 24 (=1.25) or $\frac{125}{100}$ or $\frac{30}{24}(=1.25)$ or $\frac{"250"}{2}-100$		2	M1	ft *their* 250 from (a)
			25		A1	cao
						Total 4 marks

13	1750 × 100 (= 175 000)	160 ÷ 100 (= 1.6)		4	M1 for a correct conversion (can be embedded in working) eg. 502(.654…) ÷ 100
	$\pi \times 160$ (= 502(.654…))	$\pi \times$"1.6"(= 5.02…) or			M1
	"175 000 ÷ "502(.654…)" (= 348.151…)	1750 ÷ "5.02…" (= 348.151…)			M1 allow 1750 ÷ "502(.654…)" (= 3.48…) or 175 000 ÷ "5.02" (= 34815…)
			348		A1 cao
					Total 4 marks

14	(a)		30	1	B1 allow 28 – 32
	(b)	[7.8, 8.2] × 4.5		2	M1 allow 7.8 – 8.2
			36		A1 allow 35 – 37
					Total 3 marks

15	(a)		5 7 9 11 13 15	1	B1 all numbers must be present with no repeats. Numbers can be in any order
	(b)		5 15	1	B1
	(c)		6 8 12 14 16	1	B1
					Total 3 marks

Question		Working	Answer	Mark	Notes	
14	a		110	1	B1	for 108 – 112
	b		cross marked in correct position	3	M1	for arc drawn radius 7.8 cm – 8.2 cm centre *L* **or** *P* marked 7.8 cm – 8.2 cm from *L* **or** 40 ÷ 5 (= 8)
					M1	for bearing of 238 º – 242 º from *M*
					A1	Overlay (*P* 7.8 cm – 8.2 cm from *L* and on a bearing of 238 º – 242º from *M*)
15	a		$0 < p \leq 1$	1	B1	
	b	0.5 × 19 + 1.5 × 12 + 2.5 × 5 + 3.5 × 2 + 4.5 × 2 (=56) **or** 9.5 + 18 + 12.5 + 7 + 9 (=56)	1.4	4	M2	for at least 4 correct products added (need not be evaluated) If not M2 then award M1 for consistent use of value within interval (including end points) for at least 4 products which must be added **OR** correct mid-points used for at least 4 products and not added
		"56" ÷ 40			M1	dep on at least M1 Allow division by their $\sum f$ provided addition or total under column seen
					A1	for 1.4 or $1\frac{2}{5}$

21		tan (*BCA*) = $\frac{234}{356}$	tan (*ABC*) = $\frac{356}{234}$			M1 candidates that use Pythagoras to find *BC* can gain M1 for cos *BCA* = $\frac{356}{\sqrt{234^2+356^2}}$ **or** sin *BCA* = $\frac{234}{\sqrt{234^2+356^2}}$ **or** sin *ABC* = $\frac{356}{\sqrt{234^2+356^2}}$ **or** cos *ABC* = $\frac{234}{\sqrt{234^2+356^2}}$
		(*BCA* =) $\tan^{-1}\left(\frac{234}{356}\right)$ (=33(.317...))	(*ABC* =) $\tan^{-1}\left(\frac{356}{234}\right)$ (=56(.682...))			M1 (dep) complete method to find angle *BCA* or *ABC*
		270 + '33.317...'	360 – '56.682...'			M1 complete method
				303	4	A1 accept 303 – 303.4
						Total 4 marks

22	(a)		$y = 5x - 3$ oe	2	B2 fully correct equation eg $y = 5x + -3$ or $y - -3 = 5(x - 0)$ If not B2 then B1 for $y = 5x$ or $y = 5x + a$ or $y = bx - 3$ ($b \neq 0$) or ($L=$) $5x - 3$
	(b)	$x \geq 0$, $x \leq 2$, $y \geq 1$, $y \leq 3$ or	$0 \leq x \leq 2$ $1 \leq y \leq 3$	2	B2 fully correct oe (B1 for 2 or 3 out of 4 inequalities correct) (Treat double−ended inequalities as two separate inequalities) (SC B2 $y > 3$, $y < 1$, $x < 0$, $x > 2$) Accept <, ≤, > and ≥ throughout
					Total 4 marks

15	(a)		13.5	1	B1	
	(b)	16.24 ÷ 2.03 (= 8) reading from graph from their "8"	 85 → 90	3	M1 M1 dep A1 ft	 Dependent on 1st M1 if not 85 → 90
						Total 4 marks

16	(a)		080°	1	B1	80° ok. Accept 78° → 82°
	(b)		 (×) in correct position	3	M1 M1 A1	9 cm stated or shown on diagram 8.9 to 9.1 acceptable Correct bearing (118° to 122°)
						Total 4 marks

18	(a)	$\frac{12}{4}(=3)$ or $\frac{4}{12}(=0.\dot{3})$ or $\frac{BC}{4}=\frac{16.5}{12}$ **or** $BC\div16.5=4\div12$ **or** $(BC=)16.5\div\frac{12}{4}$		2	M1	correct scale factor (given as 3 or a fraction or a ratio) **or** correct equation using BC **or** a correct expression for BC
			5.5		A1	
	(b)		$3x$	1	B1	allow $3\times x$ or $x\times 3$ ft their "3" in (a)
						Total 3 marks

19	(a)		17.75	1	B1	oe
	(b)		18.25	1	B1	oe $18.24\dot{9}$ (allow 18.2499…)
						SC B1 for 17.5 in (a) **and** 18.5 (or $18.4\dot{9}$) in (b)
						Total 2 marks

20	(a)	700 ÷ 200 (= 3.5)		3	M1	or 3.5 shown on diagram – within bounds of overlay
					M1	for line drawn at correct angle ± 2° within bounds of overlay
			C indicated in correct position		A1	for *C* drawn within bounds of overlay, inclusive of lines
	(b)		(1 :) 20 000	1	B1	
						Total 4 marks

13	2.4 ÷ 0.4 (= 6**)** or 240 ÷ 40 (= 6) or 10 ÷ 0.4 (= 25) or 1000 ÷ 40 (= 25) or 40 × 40 × 40 (= 64 000) or 0.4 × 0.4 × 0.4 (= 0.064) or 1000 × 240 × 240 (= 57 600 000) or 10 × 2.4 × 2.4 (= 57.6) oe		3	M1	could show the number of boxes along the edge of a container – award marks if this is unambiguous.
	"6" × "6" × "25" oe or "57 600 000" ÷ "64 000" or "57.6" ÷ "0.064" oe			M1	fully correct method to find greatest number of boxes
	Correct answer scores full marks (unless from obvious incorrect working)	900		A1	
					Total 3 marks

14 (a)		121	1	B1	Accept 119 – 123
(b)	Stating 6.5cm **or** an arc with centre *T*, radius 6.5 cm		3	B1	
	Line drawn or × from *S*, with a bearing of 084°			B1	
		B correctly indicated		B1	See overlay
					Total 4 marks

16	(a)		104	1	B1	accept 102 – 106
	(b)	eg "9.4" × 50 (= 470) [460 – 480] **or** eg "9.4" ÷ 2 (= 4.7) [4.6 – 4.8]		3	M1	**Their** measurement × 50 or ÷2 Working may be shown by diagram
		"9.4" × 50 ÷ 2			M1	**Their** measurement × 50 and ÷2 Working may be shown by diagram
		Correct answer scores full marks (unless from obvious incorrect working)	235		A1	accept 230 – 240
						Total 4 marks

17	(a)		140	1	B1 accept 138 – 142 May be seen on diagram.
	(b)	[5.8, 6.2]		4	M1
		'[5.8, 6.2]' × 500 (= '[2900, 3100]')			M1 ft
		'[2900, 3100]' ÷ 0.44			M1 ft
			6818		A1 ft answer in range 6590-7045 but must be an integer
					Total 5 marks

18	(a)	1 – (0.24 + 0.16 + 0.38) oe		2	M1
			0.22		A1 oe
	(b)	0.24 + 0.16 (= 0.4) oe		2	M1
			0.4		A1 oe
					Total 4 marks

10	$\frac{4}{5} \times 120$ (= 96) oe		4	M1
	"96" × 46 (= 4416) oe			M1
	"4416" – 120 × 28 or "4416" – "3360"			M1
	Correct answer scores full marks (unless from obvious incorrect working)	1056		A1
				Total 4 marks

11		**Seoul**	**Tokyo**	**Total**	correct table	3	B3 for all correct entries (B2 for 6 or 7 or 8 correct entries) (B1 for 3 or 4 or 5 correct entries)
	Business	51	35	86			
	Economy	25	69	94			
	Total	76	104	180			
	Correct answer scores full marks (unless from obvious incorrect working)						**Total 3 marks**

12	(a)	[7.3 – 7.7] × 3		2	M1
		Correct answer scores full marks (unless from obvious incorrect working)	22.5		A1 accept an answer in the range 21.9 – 23.1
	(b)	for stating 8 cm **or** within or on guidelines on overlay		1	B1
		for × from B with a bearing of 110° **or** × plotted within or on guidelines on overlay **or** line drawn within or on guidelines		1	B1
			Correct position	1	B1 within or on guidelines
					Total 5 marks

10	a		050	1	B1 ±2°, condone 50
	b	7 × 2.5			M1 allow 6.8 – 7.2 for 7
			17.5	2	A1 accept 17-18
	c				M1 for a bearing of 115±2° from *A*
					M1 for 20 ÷ 2.5 (= 8) **or** for an arc drawn 8 cm from *B* within tolerance
			C marked within tolerance	3	A1
					Total 6 marks

11	(−2, −4) (−1, −1) (0, 2) (1, 5) (2, 8) (3, 11) (4, 14)	Correct line between $x = -2$ and $x = 4$	3	B3 for a correct line between $x = -2$ and $x = 4$ B2 for a correct straight line segment through at least 3 of (−2, −4) (−1, −1) (0, 2) (1, 5) (2, 8) (3, 11) (4, 14) **OR** for all of (−2, −4) (−1, −1) (0, 2) (1, 5) (2, 8) (3, 11) (4, 14) plotted but not joined **OR** for a line drawn with a positive gradient through (0, 2) and clear intention to use a gradient of 3 B1 for at least 2 correct points stated (may be in a table) **OR** for a line drawn with a positive gradient through (0, 2) **OR** for a line with a gradient of 3
				Total 3 marks

6	(a)		(1, 4)	1	B1	
	(b)	180 + "68" or 360 – "112"		2	M1	accept 66° to 70° or 110° to 114° seen or used.
			248		A1	accept 246° to 250°
	(c)		5.4	1	B1	accept 5.2 cm to 5.6 cm ignore answer line if 1dp answer given on diagram or in space.
	(d)		27	1	B1ft	ft "*their* c" × 5 if B1 awarded in part (c)
	(e)		2 hr 20 min	2	B1 B1	for 2 hours for 20 minutes if no marks awarded, SC B1 for eg 1hr 80min or 140min
						Total 7 marks

7	(a)		4	1	B1	
	(b)		24*ab*	1	B1	accept *ab*24 etc. but no × signs
	(c)	$8w + w$ or $-4y$ (+) $-3y$		2	M1	M1 for $9w$ or $-7y$
			$9w - 7y$		A1	
	(d)		$4(4 + 3t)$ oe	2	B2	if not B2 then B1 for $2(8 + 6t)$
						Total 6 marks