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GCSE MATHS

Geometry and measures

Edexcel 1MA1 | Subtopic collection Topic 37

Angles, parallel lines and polygons

Foundation tier

Past paper question booklet

183	2010-2025	Foundation
question groups	available papers	tier

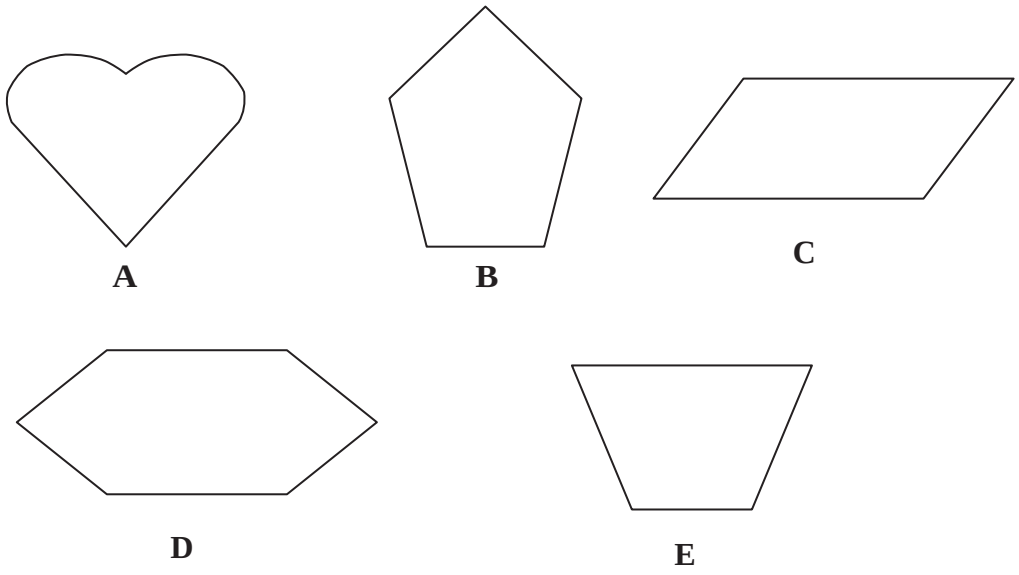
Before you begin

1. Show working and use units where appropriate.
2. Use extra paper if you need more space.
3. Print at actual size (100%) for measurement questions.

Name _____ **Date** _____

Whole questions are retained for context; some parts cover other points. Legacy sources are labelled.

3 Here are five shapes.



One of these shapes is a parallelogram.

(a) Write down the letter of this shape.

.....

(1)

One of these shapes has exactly **two** lines of symmetry.

(b) Which shape?

.....

(1)

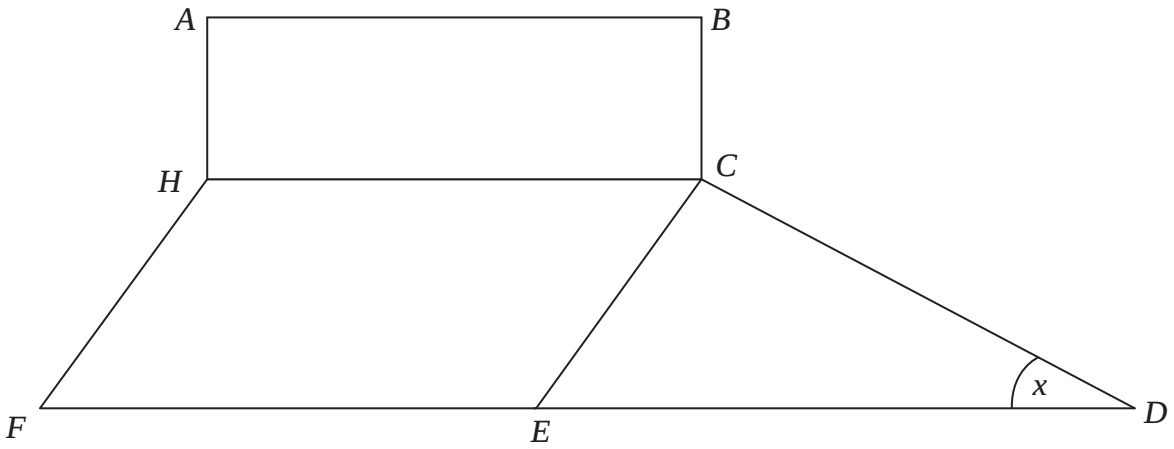
(c) Write down the order of rotational symmetry of shape **C**.

.....

(1)

(Total for Question 3 is 3 marks)

7 The diagram shows a rectangle, a parallelogram and a triangle.



(a) Mark with arrows (>>) a pair of parallel lines.

(1)

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

.....

(1)

(c) Mark the angle HCE with the letter y.

(1)

(Total for Question 7 is 3 marks)

13

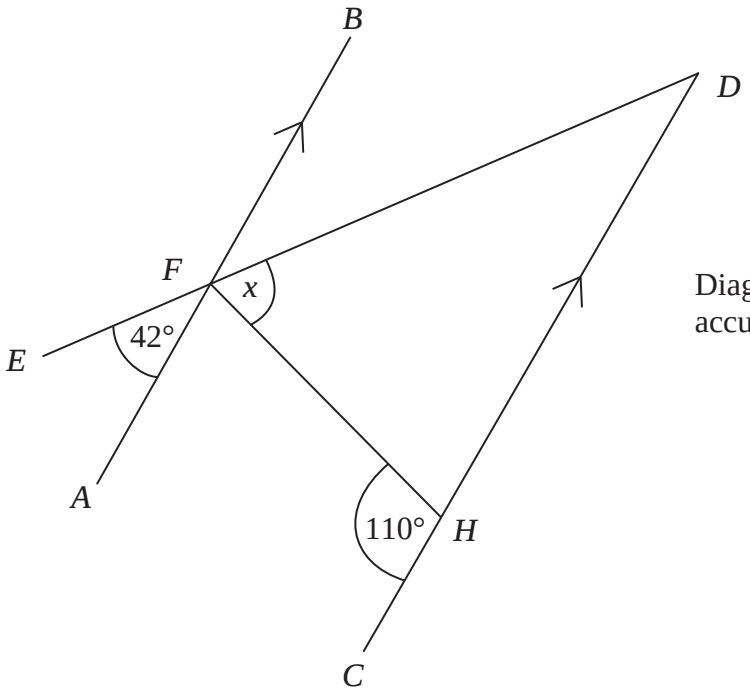


Diagram **NOT** accurately drawn

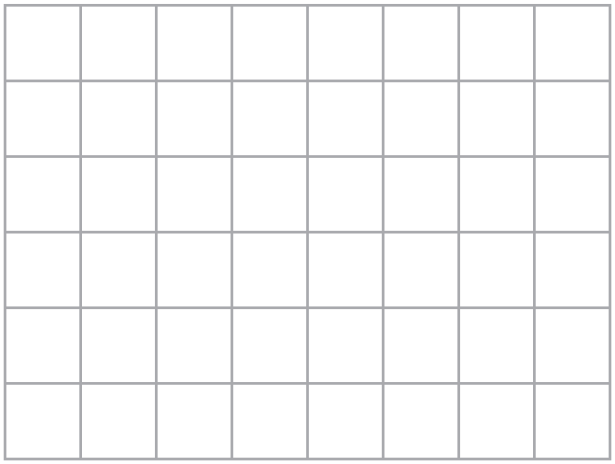
AFB and *CHD* are parallel lines.
EFD is a straight line.

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

x = ... °

(Total for Question 13 is 3 marks)

1 (a) On the grid, draw a kite.



(1)

(b) Here is a quadrilateral.



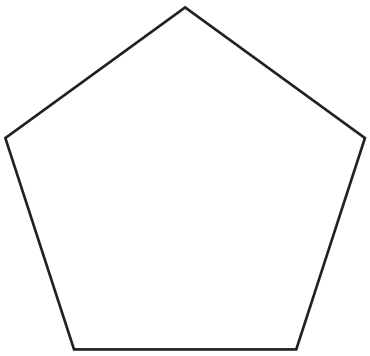
Write down the special name of this quadrilateral.

.....

(1)

(Total for Question 1 is 2 marks)

3 Here is a regular pentagon.



(a) What is the order of rotational symmetry of this pentagon?

.....

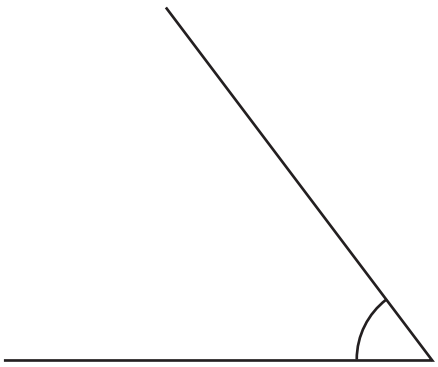
(1)

(b) Draw a line of symmetry on this pentagon.

(1)

(Total for Question 3 is 2 marks)

4 (i) What type of angle is this?



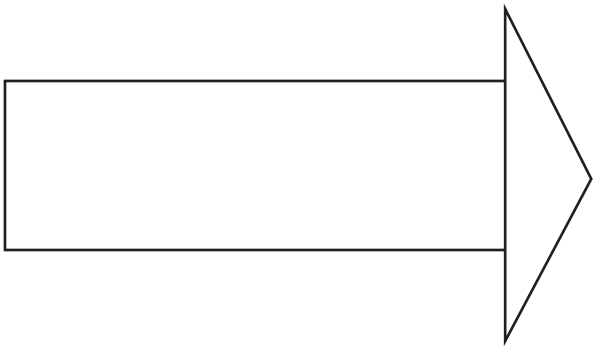
.....

(ii) Measure the size of the angle.

.....°

(Total for Question 4 is 2 marks)

6 The shape below is made from a rectangle and a triangle.



(a) Mark with arrows (>>) a pair of parallel lines.

(1)

(b) Mark with the letter A an acute angle.

(1)

(Total for Question 6 is 2 marks)

10 (a)

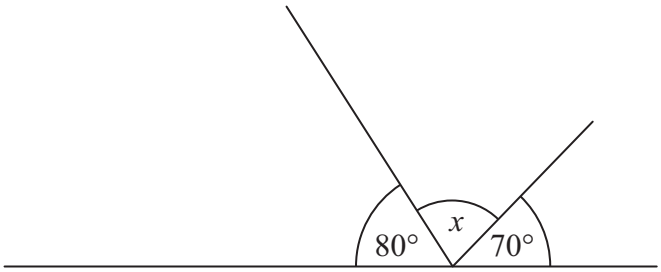


Diagram **NOT** accurately drawn

Work out the size of the angle marked x.

.....°

(2)

(b)

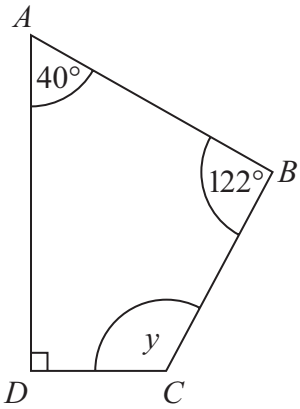


Diagram **NOT** accurately drawn

$ABCD$ is a quadrilateral.

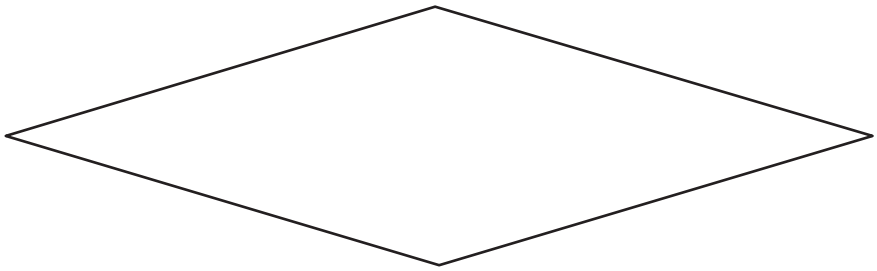
Work out the size of the angle marked y.

.....°

(2)

(Total for Question 10 is 4 marks)

1 This quadrilateral has all 4 sides the same length.



(a) Write down the special name of this quadrilateral.

.....

(1)

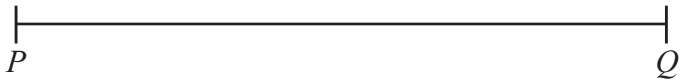
(b) On the shape, draw all the lines of symmetry.

(1)

(Total for Question 1 is 2 marks)

3 (a) Measure the length of the line PQ.

Give your answer in centimetres.



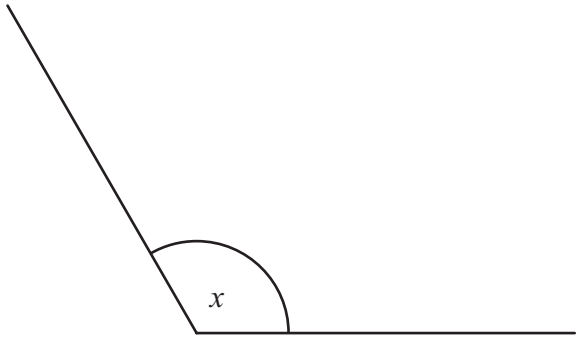
..... cm

(1)

(b) Mark with a cross (×) the point on the line PQ that is 5 cm from Q.

(1)

(c)



(i) Write down the special name for angle x.

.....

(ii) Measure the size of angle x.

.....°

(2)

(Total for Question 3 is 4 marks)

7

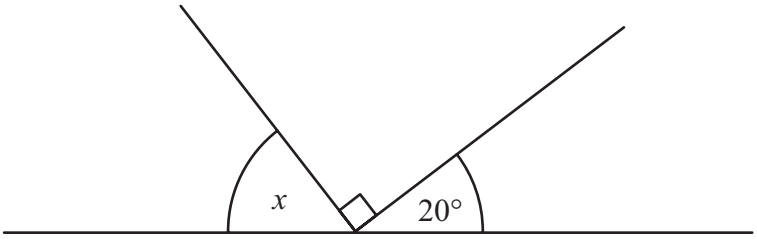


Diagram **NOT** accurately drawn

(i) Work out the size of the angle marked x.

.....°

(ii) Give a reason for your answer.

.....

(Total for Question 7 is 2 marks)

***17**

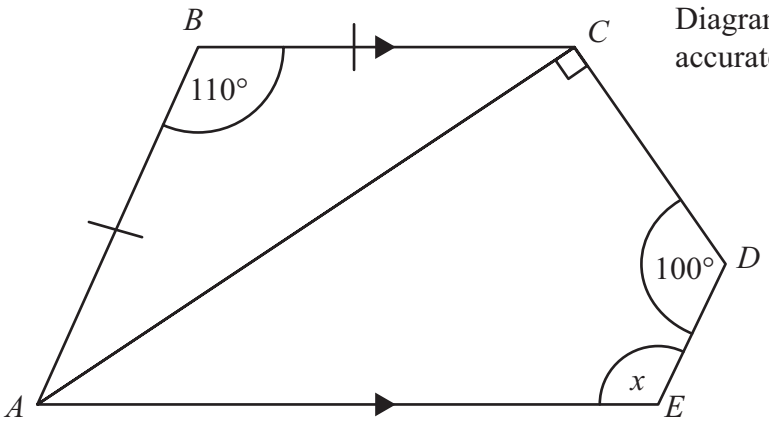


Diagram **NOT** accurately drawn

ABC is an isosceles triangle.
AB = *BC*.
Angle *ABC* = 110°.

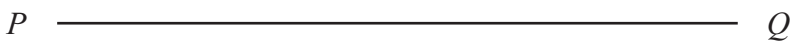
ACDE is a quadrilateral.
Angle *CDE* = 100°.
Angle *ACD* is a right-angle.

AE is parallel to *BC*.

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

(Total for Question 17 is 4 marks)

6 (i) Measure the length of PQ.



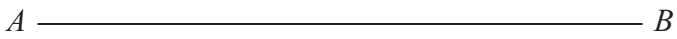
$PQ =$ ..... cm

(ii) Mark with a cross (×) the midpoint of the line PQ.

(iii) Draw a line perpendicular to the line PQ.

(Total for Question 6 is 3 marks)

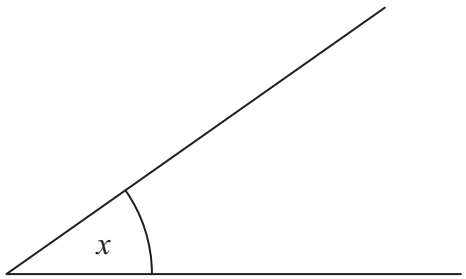
2 (a) Measure the length of the line AB.
Give your answer in centimetres.



..... cm

(1)

(b) Measure the size of angle x.



..... °

(1)

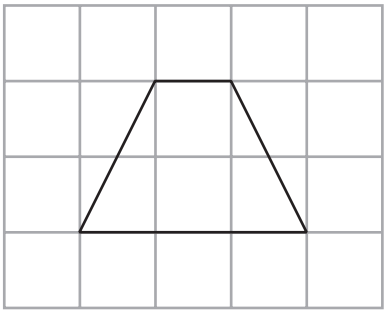
(c) In the space below, draw accurately a circle of radius 5 cm.
Use the point C as the centre of your circle.



(1)

(Total for Question 2 is 3 marks)

16 A quadrilateral has been drawn on the grid.

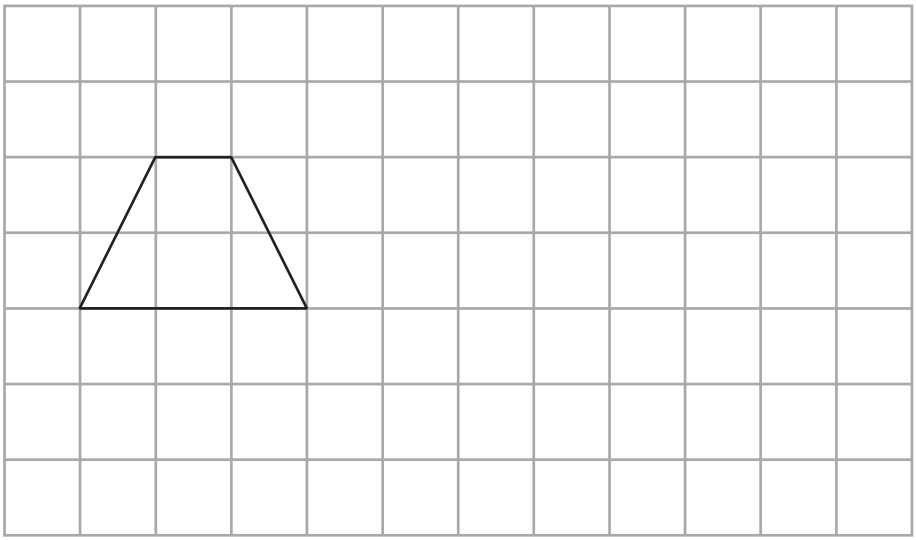


(a) Write down the mathematical name of this quadrilateral.

.....

(1)

(b) On the grid below, show how the quadrilateral tessellates.
You should draw at least 6 shapes.



(2)

(Total for Question 16 is 3 marks)

***21**

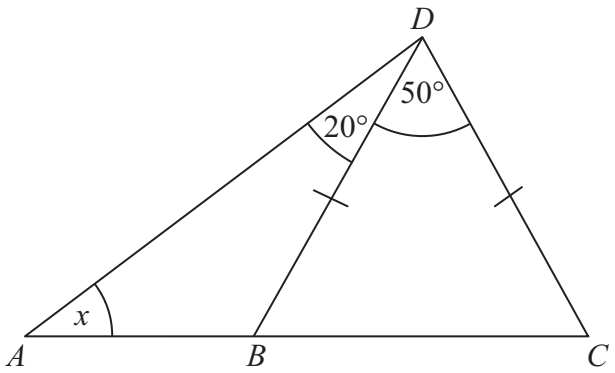


Diagram **NOT** accurately drawn

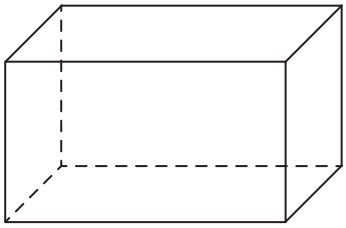
ABC is a straight line.
BD = *CD*.
Angle *BDC* = 50°.
Angle *ADB* = 20°.

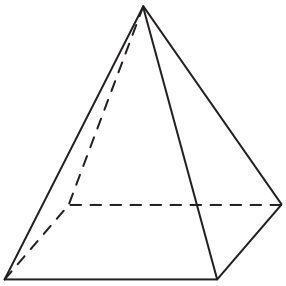
Work out the size of the angle marked *x*.
Give reasons for your answer.

(Total for Question 21 is 4 marks)

Question 17

2 Write down the name of each of these 3-D shapes.

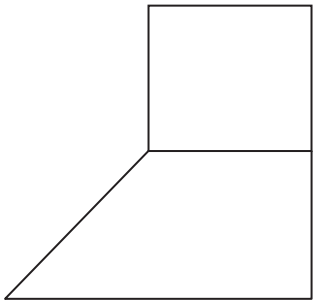




(i) ..... (ii) .....

(Total for Question 2 is 2 marks)

5 Here is a square and a trapezium.



(a) Write down the size of each angle of the square.

..... °

(1)

(b) Mark, with the letter O, an obtuse angle.

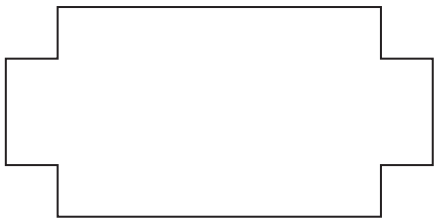
(1)

(c) Find two lines that are perpendicular.
Mark each of these lines with a letter P.

(1)

(Total for Question 5 is 3 marks)

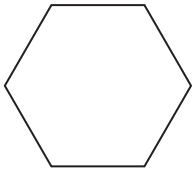
7 Here is a shape.



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

(2)

Here is a regular hexagon.



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

.....

(1)

(Total for Question 7 is 3 marks)

10

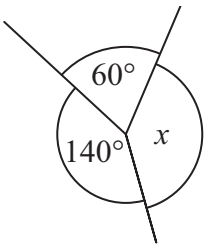


Diagram **NOT** accurately drawn

(i) Work out the size of angle x.

..... °

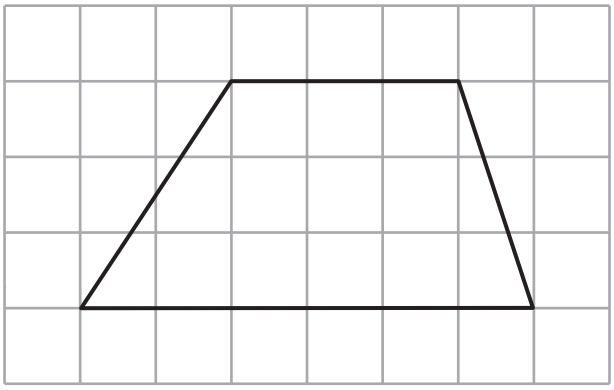
(ii) Give a reason for your answer.

.....

.....

(Total for Question 10 is 2 marks)

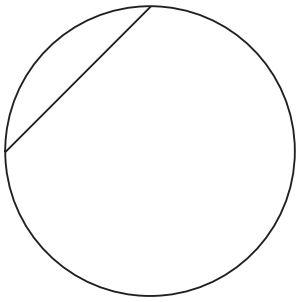
2 (a) Here is a quadrilateral.



Write down the mathematical name of this quadrilateral.

.....

(1)

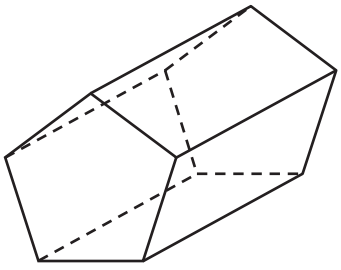


(b) Write down the mathematical name for the straight line inside this circle.

.....

(1)

(c) Here is a solid prism.



(i) Write down the number of faces.

..... faces

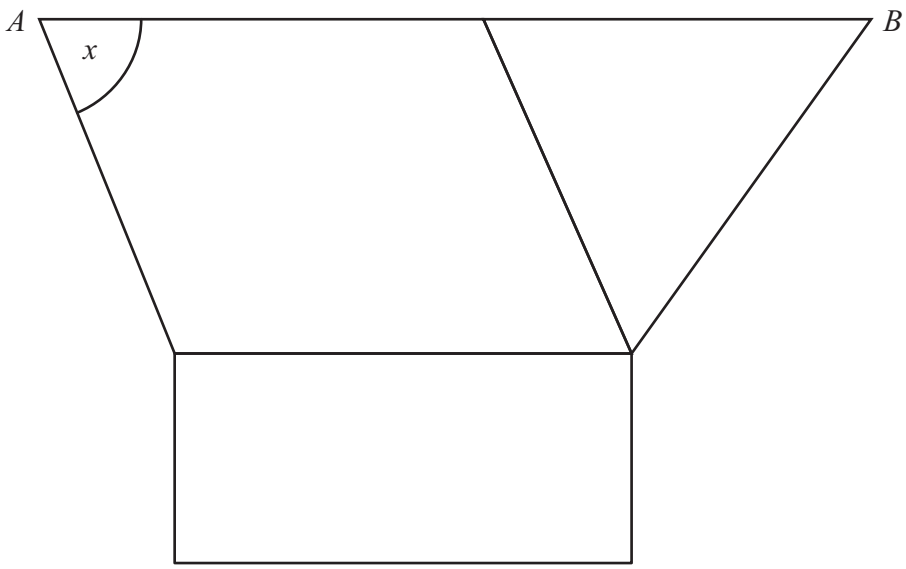
(ii) Write down the number of vertices.

..... vertices

(2)

(Total for Question 2 is 4 marks)

5 The diagram shows a rectangle, a parallelogram and a triangle.



(a) On the diagram,

(i) mark with arrows (>>) a pair of parallel lines,

(ii) mark with *P*s two lines that are perpendicular to each other.

(2)

(b) (i) Measure the length of the line *AB*.

..... cm

(ii) Measure the size of the angle marked *x*.

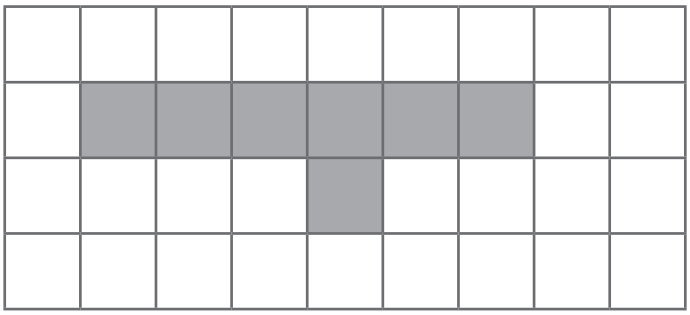
°

.....

(2)

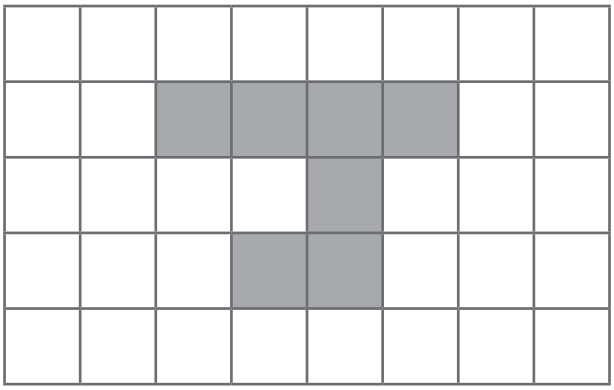
(Total for Question 5 is 4 marks)

8 (a) On the grid, shade in one more square so that the completed shape has one line of symmetry.



(1)

(b) On the grid below, shade in two more squares so that the completed shape has rotational symmetry of order 2



(1)

(Total for Question 8 is 2 marks)

***11**

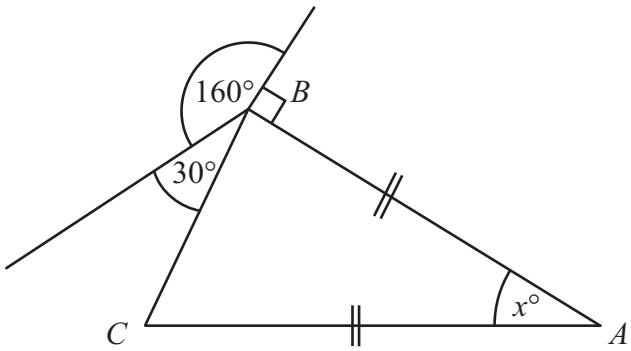


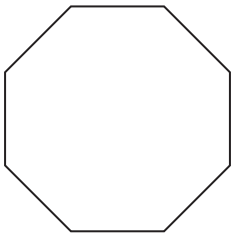
Diagram **NOT** accurately drawn

ABC is an isosceles triangle.

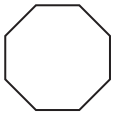
Work out the size of the angle marked $x°$.
Give reasons for your answer.

(Total for Question 11 is 5 marks)

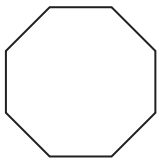
1 Here are some regular polygons.



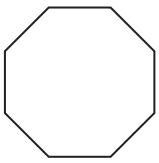
A



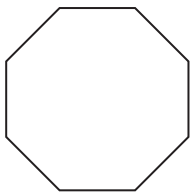
B



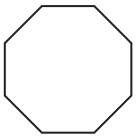
C



D



E



F

All these regular polygons have the same mathematical name.

(a) Write down this mathematical name.

.....

(1)

Two of these polygons are congruent.

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

..... and .....

(1)

The interior angles of this regular polygon add up to 1080°

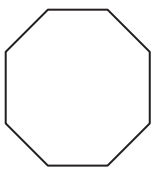


Diagram **NOT** accurately drawn

(c) What is the size of one interior angle?

..... °

(2)

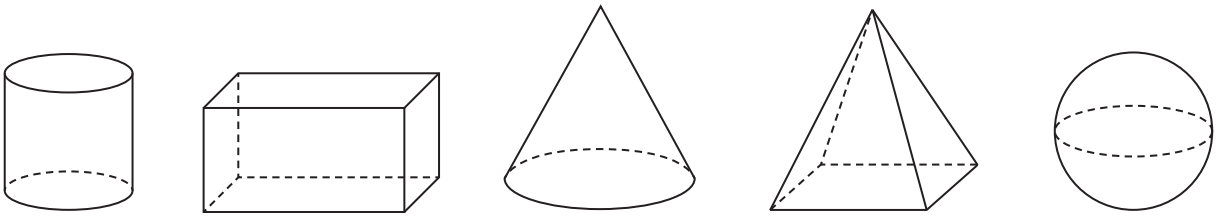
(Total for Question 1 is 4 marks)

Question 26

3 Draw a sketch of a pentagon.

(Total for Question 3 is 1 mark)

1 Here are some solid 3-D shapes.



A **B** **C** **D** **E**

(a) Write down the letter of the shape that is a sphere.

.....

(1)

(b) Write down the mathematical name of shape **A**.

.....

(1)

(c) How many faces does shape **B** have?

.....

(1)

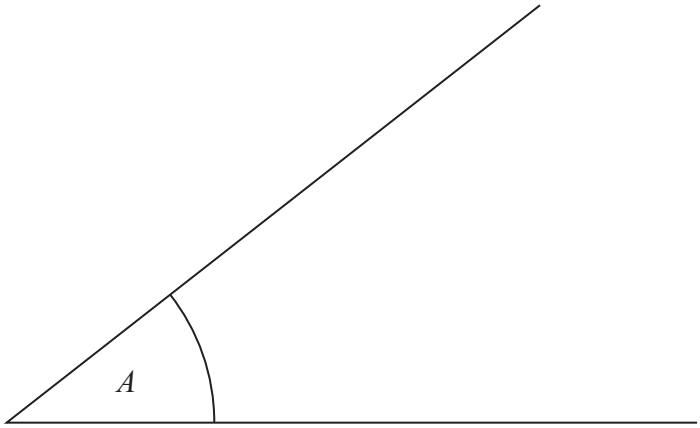
(d) How many edges does shape **D** have?

.....

(1)

(Total for Question 1 is 4 marks)

4



(a) Measure the size of the angle marked A.

.....°

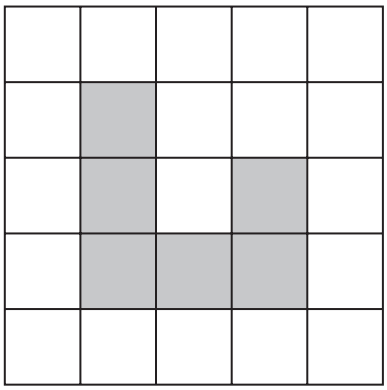
(1)

(b) In the space below, draw a line of length 5 cm.

(1)

(Total for Question 4 is 2 marks)

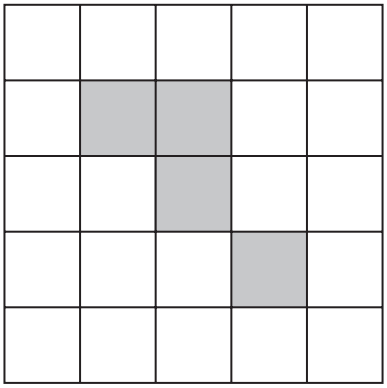
8 (a)



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

(1)

(b)



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

(1)

(Total for Question 8 is 2 marks)

*24

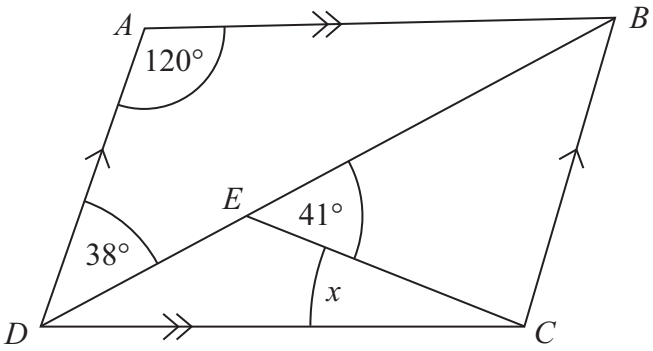


Diagram **NOT** accurately drawn

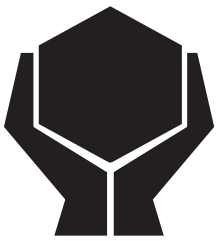
ABCD is a parallelogram.

Angle *ADB* = 38°.
Angle *BEC* = 41°.
Angle *DAB* = 120°.

Calculate the size of angle *x*.
You must give reasons for your answer.

(Total for Question 24 is 4 marks)

3 Here is a symbol.

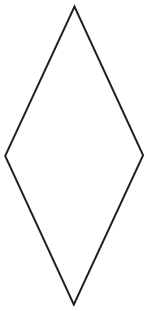


(a) Write down the number of lines of symmetry for this symbol.

.....

(1)

Here is a quadrilateral.



(b) (i) Write down the mathematical name for this quadrilateral.

.....

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

.....

(2)

(Total for Question 3 is 3 marks)

***15**

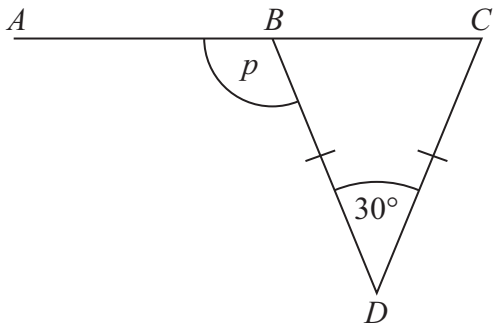


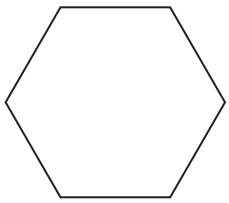
Diagram **NOT** accurately drawn

ABC is a straight line.
BD = *CD*.
Angle *BDC* = 30°.

Work out the size of the angle marked *p*.
You must give reasons for your answer.

(Total for Question 15 is 4 marks)

2 (a)

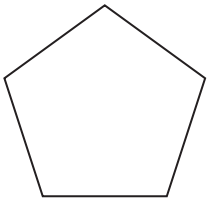


Write down the mathematical name of this polygon.

.....

(1)

(b)

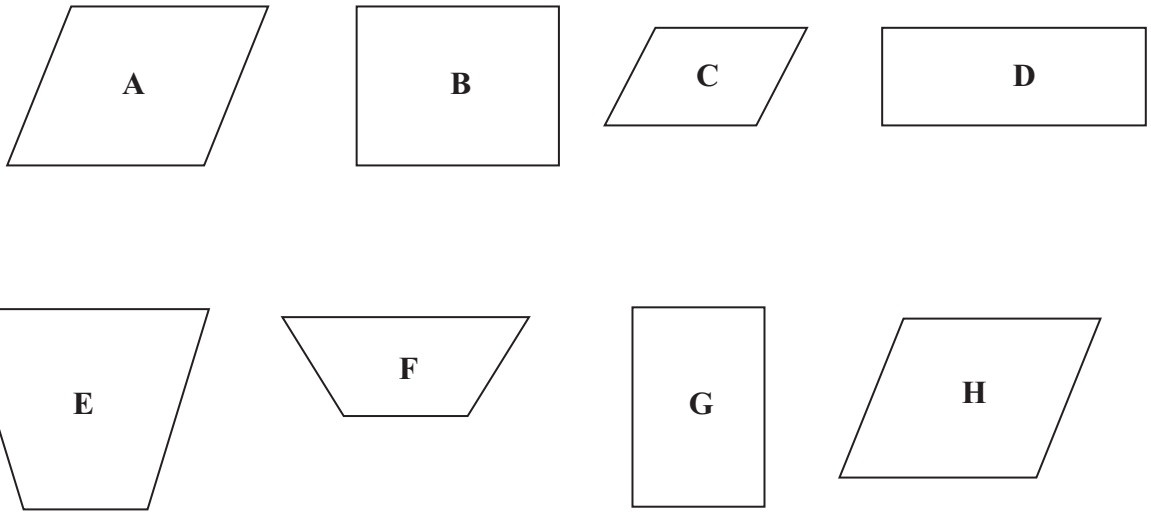


Write down the mathematical name of this polygon.

.....

(1)

(c) Here are eight shapes.



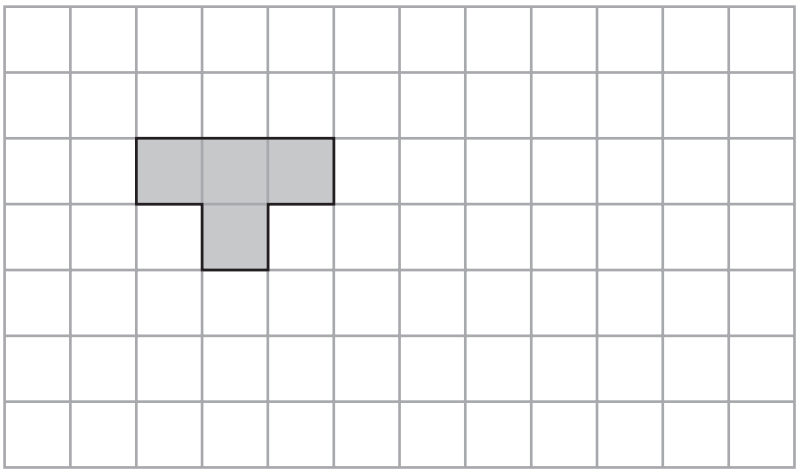
Two of these shapes are congruent.
Write down the letters of these two shapes.

..... and .....

(1)

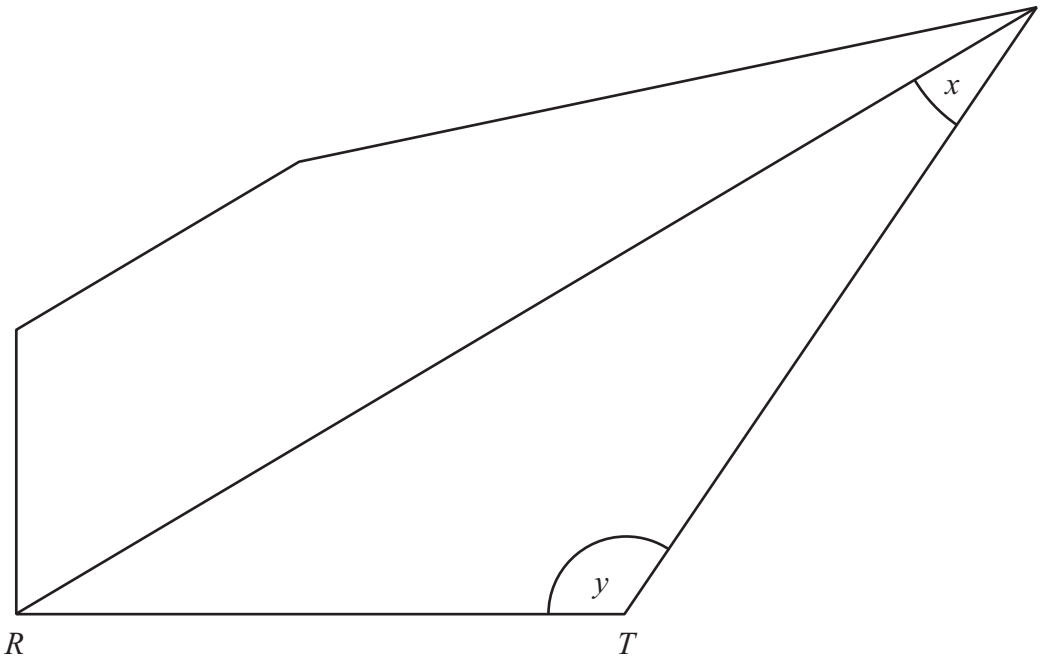
(Total for Question 2 is 3 marks)

14 On the grid, show how this shape will tessellate.
You should draw at least 8 more shapes.



(Total for Question 14 is 2 marks)

2



(a) Mark with arrows (>>) a pair of parallel lines.

(1)

(b) Measure the length of the line *RT*.

..... cm

(1)

(c) What type of angle is angle *x*?

.....

(1)

(d) Measure the size of angle *y*.

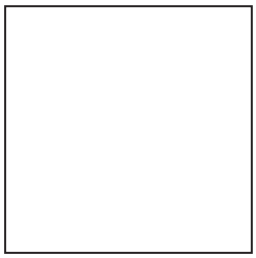
°

.....

(1)

(Total for Question 2 is 4 marks)

6 Here is a square.



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

(2)

Here is a rectangle.



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

.....

(1)

Here is a different rectangle.

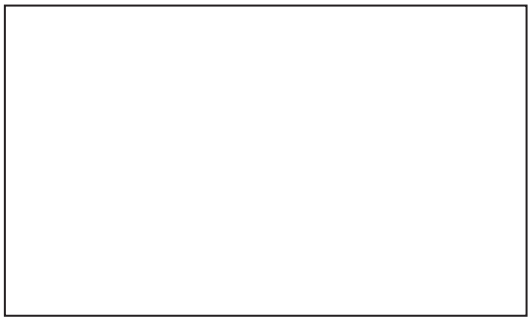


Diagram **NOT** accurately drawn

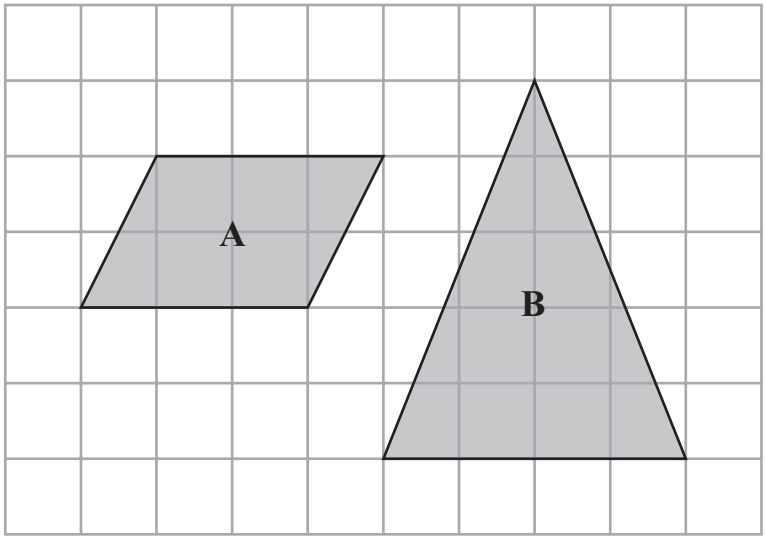
(c) Work out the area of this rectangle.

..... cm^2

(2)

(Total for Question 6 is 5 marks)

10 Here are a quadrilateral and a triangle drawn on a centimetre grid.



(a) Write down the special name for quadrilateral **A**.

.....

(1)

(b) Write down the special name for triangle **B**.

.....

(1)

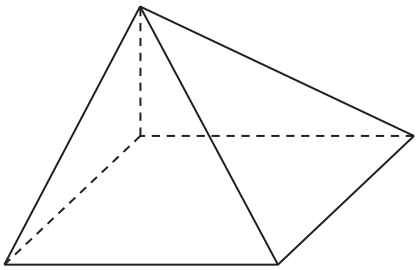
(c) Find the area of quadrilateral **A**.

..... cm^2

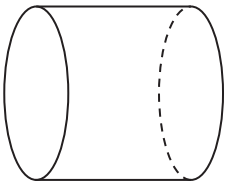
(2)

(Total for Question 10 is 4 marks)

3 Here are two 3-D shapes.



Shape A



Shape B

(a) Write down the mathematical name of

(i) Shape A,

.....

(ii) Shape B.

.....

(2)

(b) Write down the number of edges that Shape A has.

.....

(1)

(Total for Question 3 is 3 marks)

Question 39

11 Here is a rectangle.



Draw all the lines of symmetry on this rectangle.

(Total for Question 11 is 2 marks)

***14**

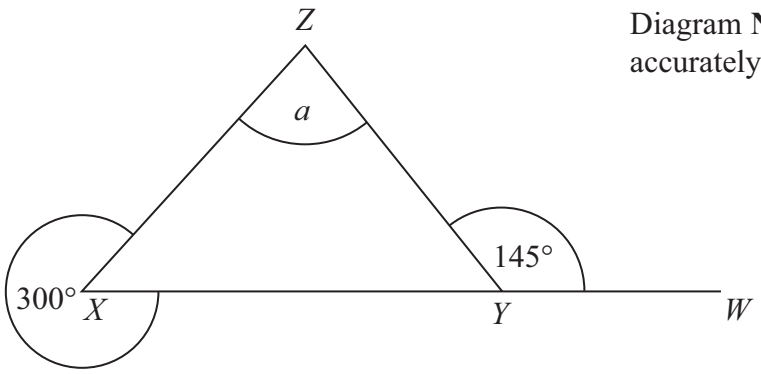


Diagram **NOT** accurately drawn

XYW is a straight line.

Work out the size of the angle marked *a*.
You must give reasons for your answer.

(Total for Question 14 is 4 marks)

16 Here is a list of the names of five types of quadrilateral.

trapezium parallelogram square rhombus rectangle

(a) From the list, write down the names of two quadrilaterals which must have all four sides the same length.

..... and .....

(1)

trapezium parallelogram square rhombus rectangle

(b) From the list, write down the name of the quadrilateral that has only one pair of parallel sides.

.....

(1)

trapezium parallelogram square rhombus rectangle

For one of these quadrilaterals,

the corners are not right angles,
the quadrilateral has rotational symmetry of order 2
and the diagonals cross at right angles.

(c) Write down the name of this quadrilateral.

.....

(1)

(Total for Question 16 is 3 marks)

4 Here is a 6-sided polygon.



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

.....

(1)

(b) How many sides has a pentagon?

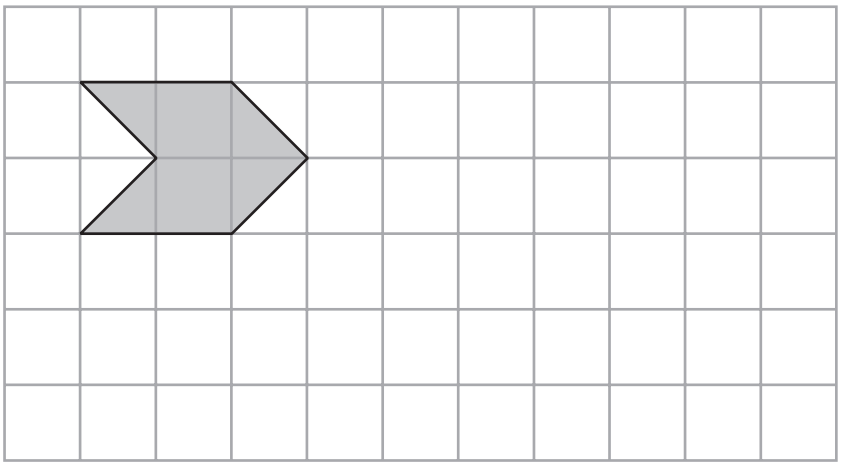
.....

(1)

(Total for Question 4 is 2 marks)

Question 43

16 On the grid below, show how the shape tessellates.
You must draw at least 6 more shapes.



(Total for Question 16 is 2 marks)

20 The diagram shows two regular shapes.

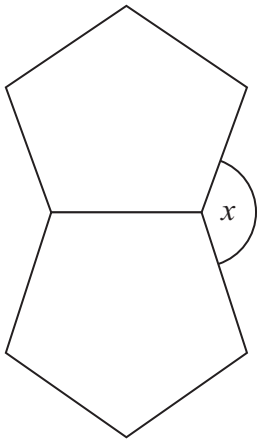


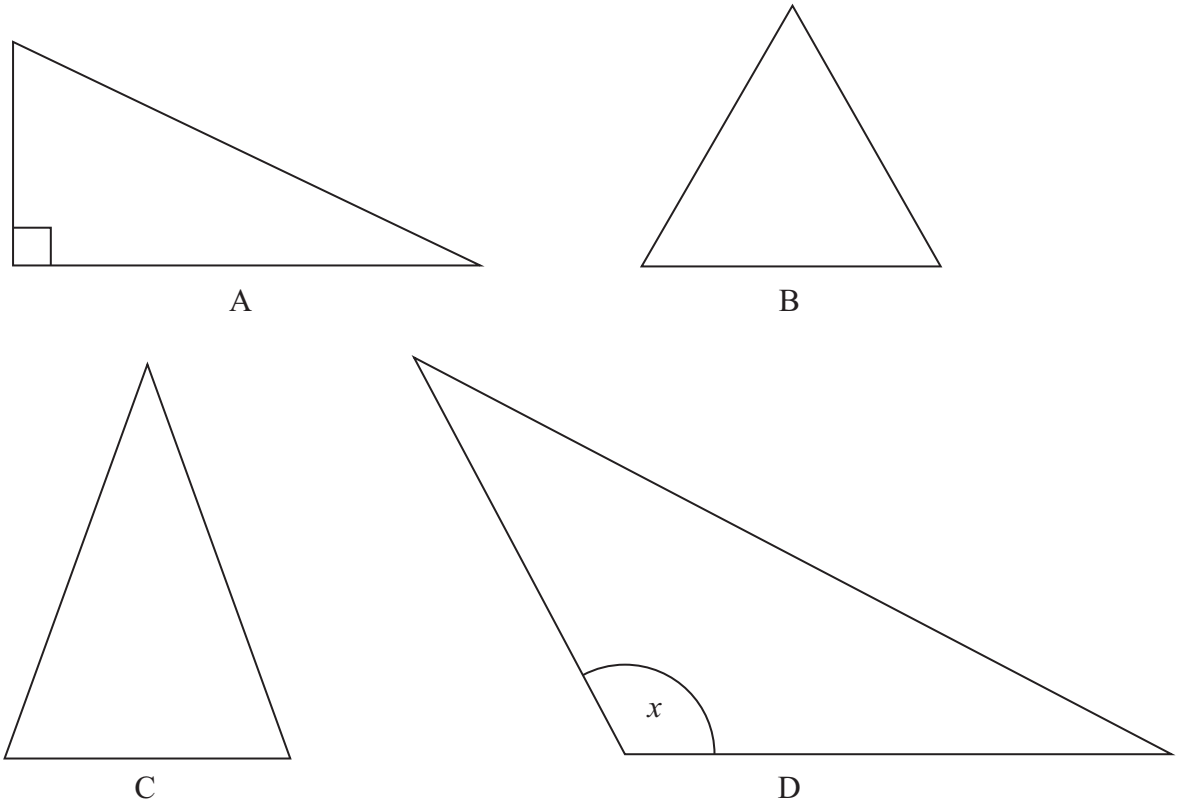
Diagram **NOT** accurately drawn

Work out the size of the angle marked x.

.....°

(Total for Question 20 is 3 marks)

1 Here are four triangles.



One of these triangles is an equilateral triangle.

(a) Write down the letter of the equilateral triangle.

.....

(1)

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

..... °

(1)

(c) Measure the length of the line EF.
Give your answer in centimetres.

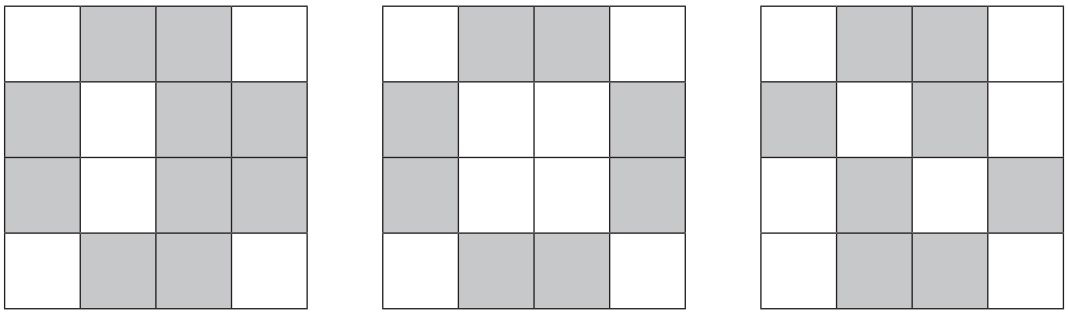
E ——————————————————— F

..... cm

(1)

(Total for Question 1 is 3 marks)

21 The diagrams show patterns made from grey tiles and white tiles.



A B C

One of the patterns has exactly 1 line of symmetry.

(a) Write down the letter of this pattern.

.....

(1)

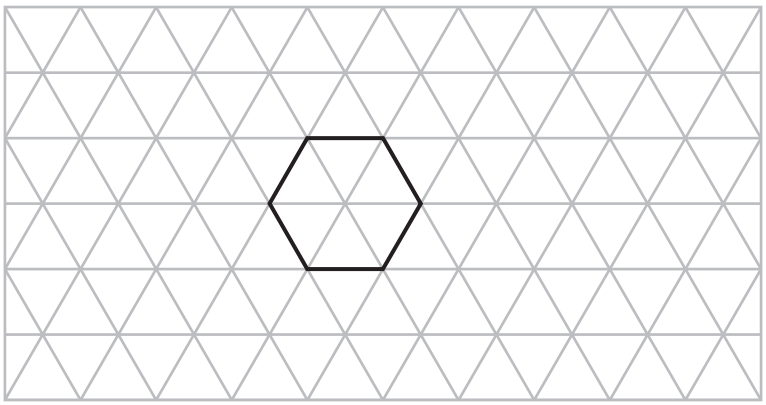
(b) Write down the order of rotational symmetry of pattern C.

.....

(1)

The diagram on the grid shows a tile in the shape of a hexagon.

(c) On the grid, show how the tile will tessellate.
You should draw at least 6 tiles.



(2)

(Total for Question 21 is 4 marks)

***25**

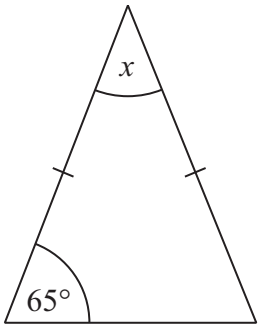
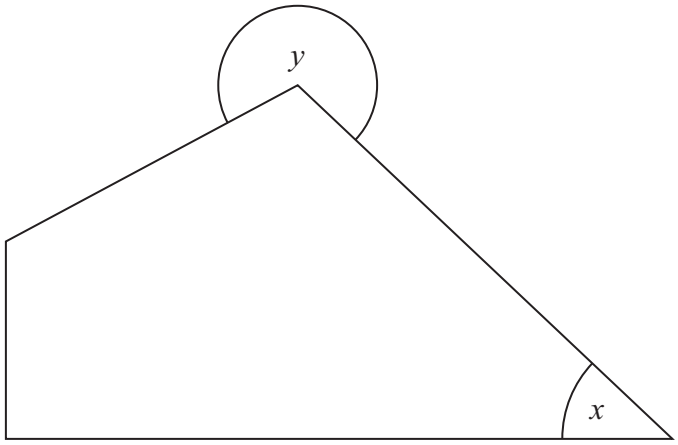


Diagram **NOT** accurately drawn

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

(Total for Question 25 is 3 marks)

3



(a) (i) On this diagram mark, with a letter R, a right angle.

(ii) What type of angle is angle x?

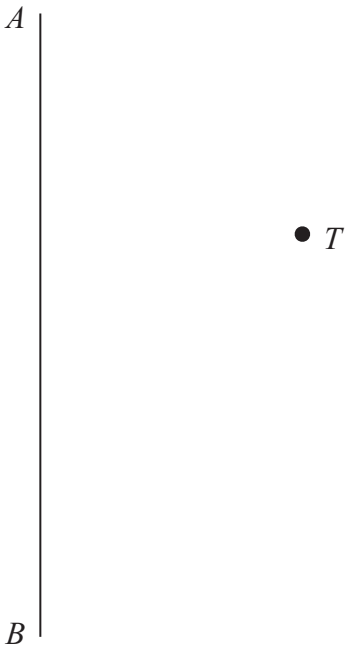
.....

(iii) What type of angle is angle y?

.....

(3)

(b) AB is a straight line.



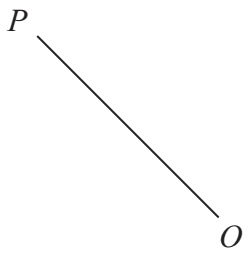
Draw a line from the point T perpendicular to the line AB.

(1)

(Total for Question 3 is 4 marks)

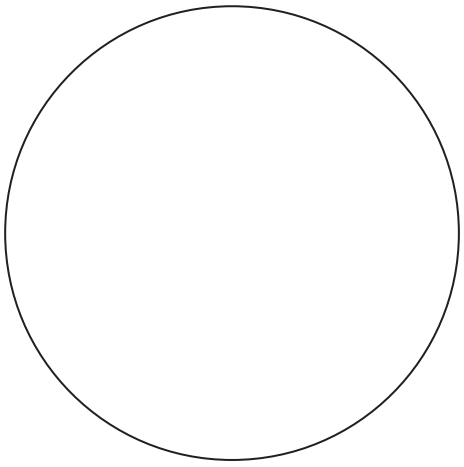
6 The line OP is a radius of a circle, centre O.

(a) Draw accurately the circle.



(1)

(b) On the circle below, draw a chord.



(1)

(Total for Question 6 is 2 marks)

***20**

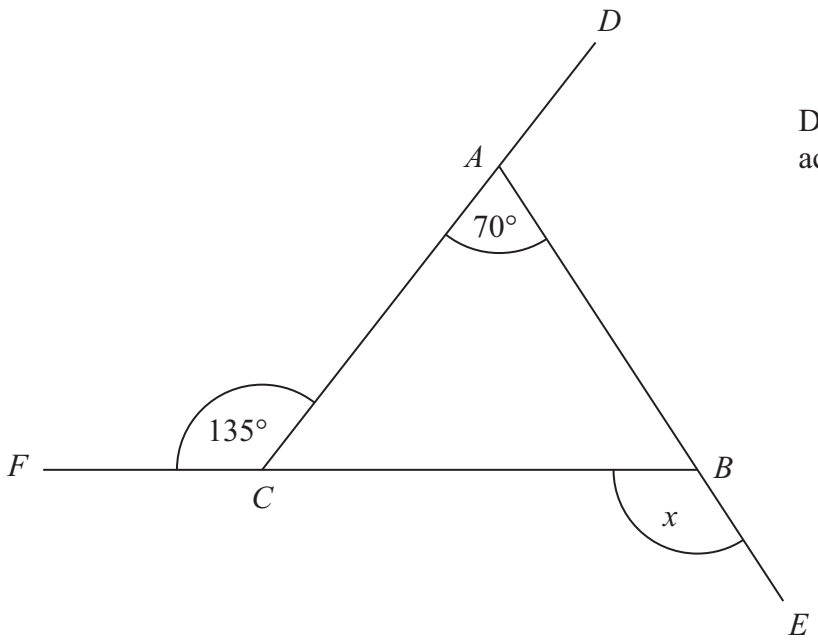


Diagram **NOT** accurately drawn

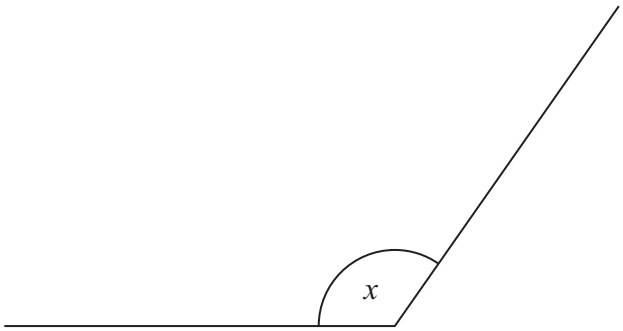
DAC, *FCB* and *ABE* are straight lines.

Work out the size of the angle marked *x*.
You must give reasons for your answer.

(Total for Question 20 is 5 marks)

Question 51

2



(a) Write down the special name for the angle marked x.

.....

(1)

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

.....°

(1)

(Total for Question 2 is 2 marks)

***14**

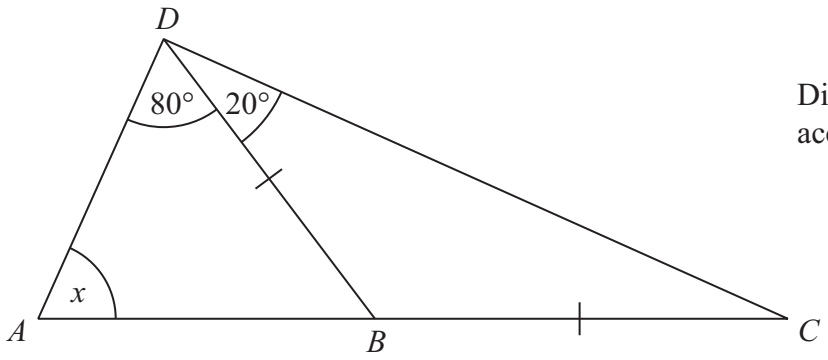


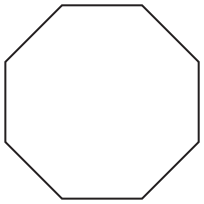
Diagram **NOT** accurately drawn

ABC is a straight line.
BD = *BC*
Angle *ADB* = 80°
Angle *BDC* = 20°

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

(Total for Question 14 is 4 marks)

3 Here is a polygon.



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

.....

(1)

(b) In the space below, draw a pentagon.

(1)

Here is a heptagon.

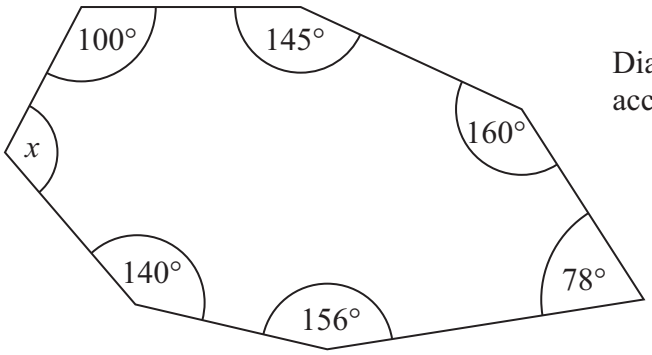


Diagram **NOT** accurately drawn

All the angles of a heptagon add up to 900°

(c) Work out the size of the angle marked x.

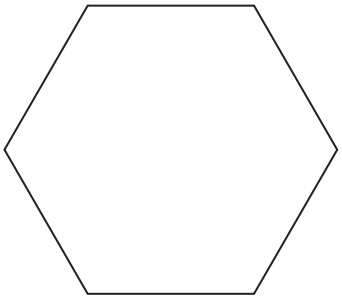
.....°

(3)

(Total for Question 3 is 5 marks)

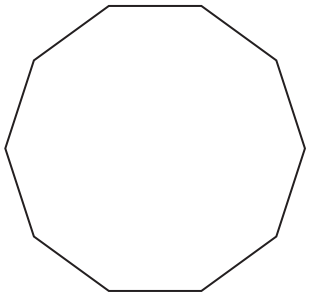
2 Write down the mathematical name of each of these polygons.

(i)



.....

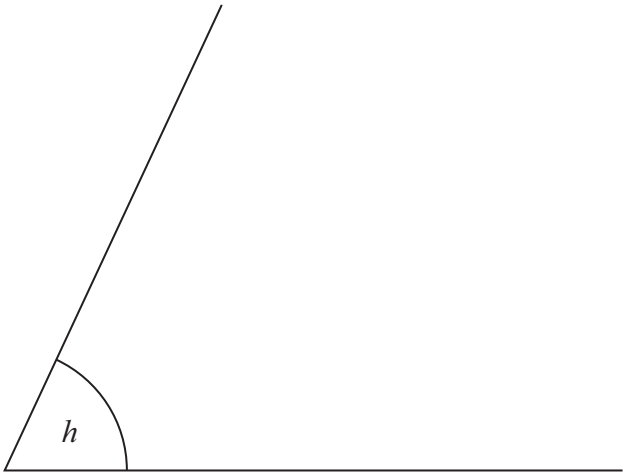
(ii)



.....

(Total for Question 2 is 2 marks)

4



(a) (i) What type of angle is angle h ?

.....

(ii) Measure the size of angle h.

..... °

(2)

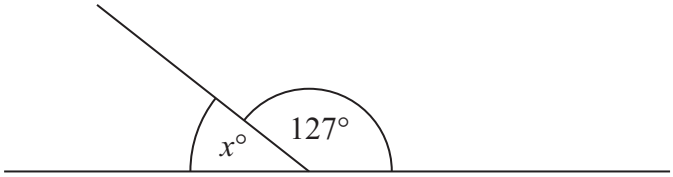


Diagram **NOT** accurately drawn

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

$x =$ .....

(ii) Give a reason for your answer.

.....

.....

(2)

(Total for Question 4 is 4 marks)

24 The diagram shows a pattern using four identical rhombuses.

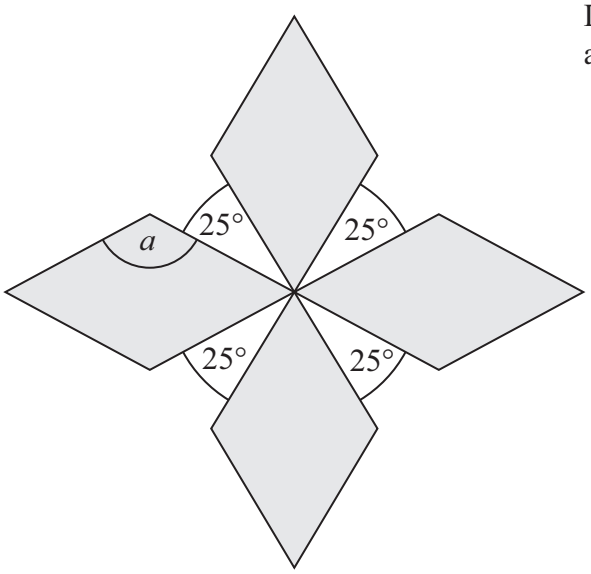


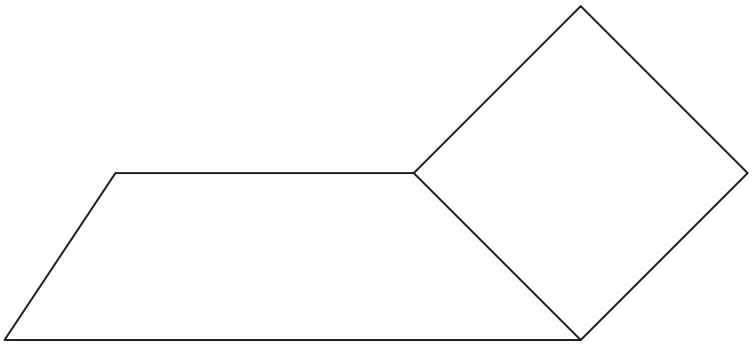
Diagram **NOT** accurately drawn

Work out the size of the angle marked a.
You must show your working.

.....°

(Total for Question 24 is 4 marks)

1 The diagram shows a trapezium and a square.



(a) Write down the size of each of the angles of a square.

..... °

(1)

(b) Mark, with the letter *O,* an obtuse angle.

(1)

(c) Mark, with arrows (>>), a pair of parallel lines.

(1)

(Total for Question 1 is 3 marks)

8

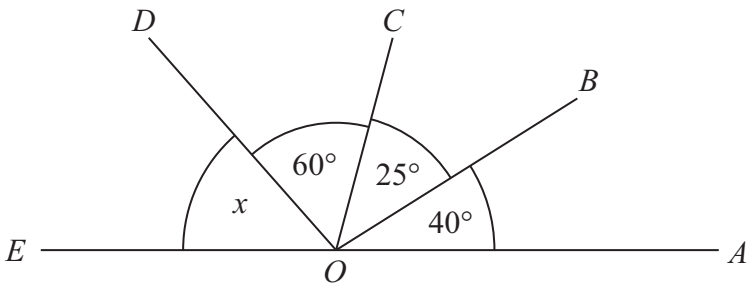


Diagram **NOT** accurately drawn

(a) Write down the size of the angle *AOB*.

..... °

(1)

EOA is a straight line.

(b) (i) Work out the size of the angle marked *x*.

..... °

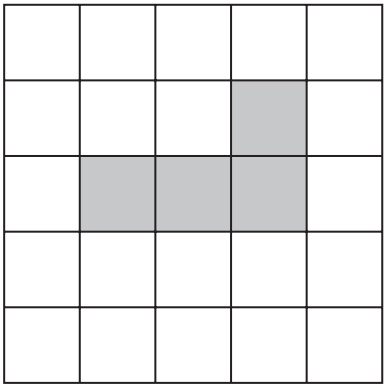
(ii) Give a reason for your answer.

.....

(3)

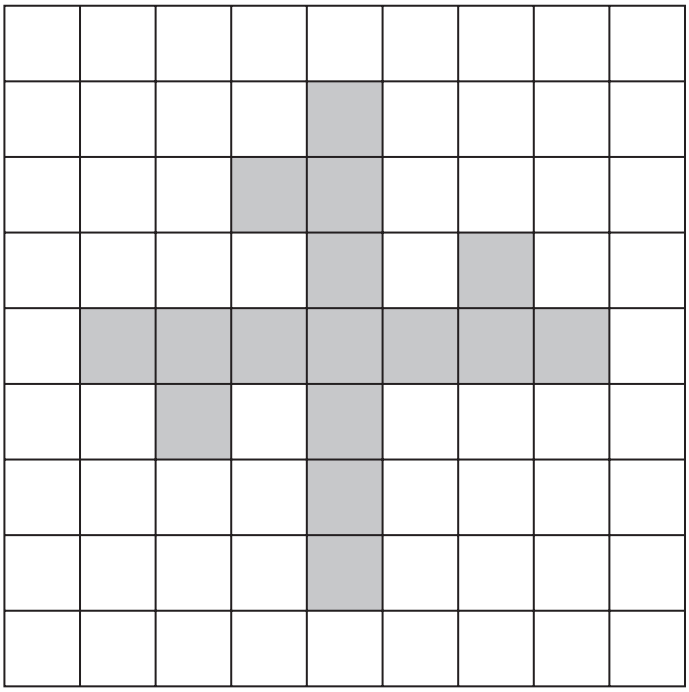
(Total for Question 8 is 4 marks)

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



(1)

(b) Shade **one** more square to make a pattern with rotational symmetry of order 4



(1)

(Total for Question 12 is 2 marks)

14 Here is an isosceles triangle.

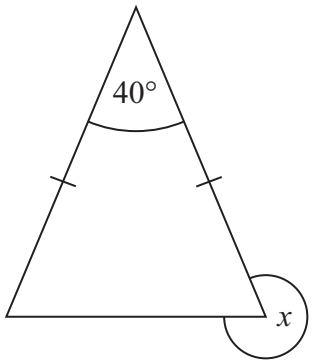


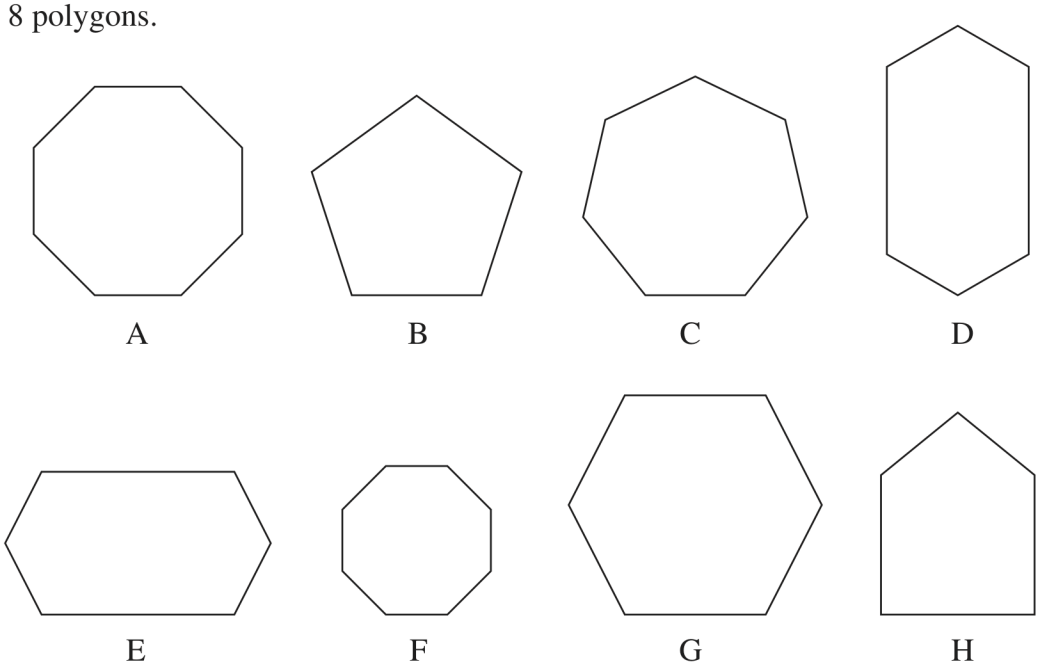
Diagram **NOT** accurately drawn

Work out the size of the angle marked x.

.....°

(Total for Question 14 is 3 marks)

3 Here are 8 polygons.



(a) Write down the mathematical name for polygon G.

.....

(1)

Two of the polygons are congruent.

(b) Write down the letters of these polygons.

..... and .....

(1)

One of the polygons is similar to polygon F.

(c) Write down the letter of this polygon.

.....

(1)

The interior angles of this regular polygon add up to 540°.

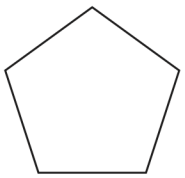


Diagram **NOT** accurately drawn

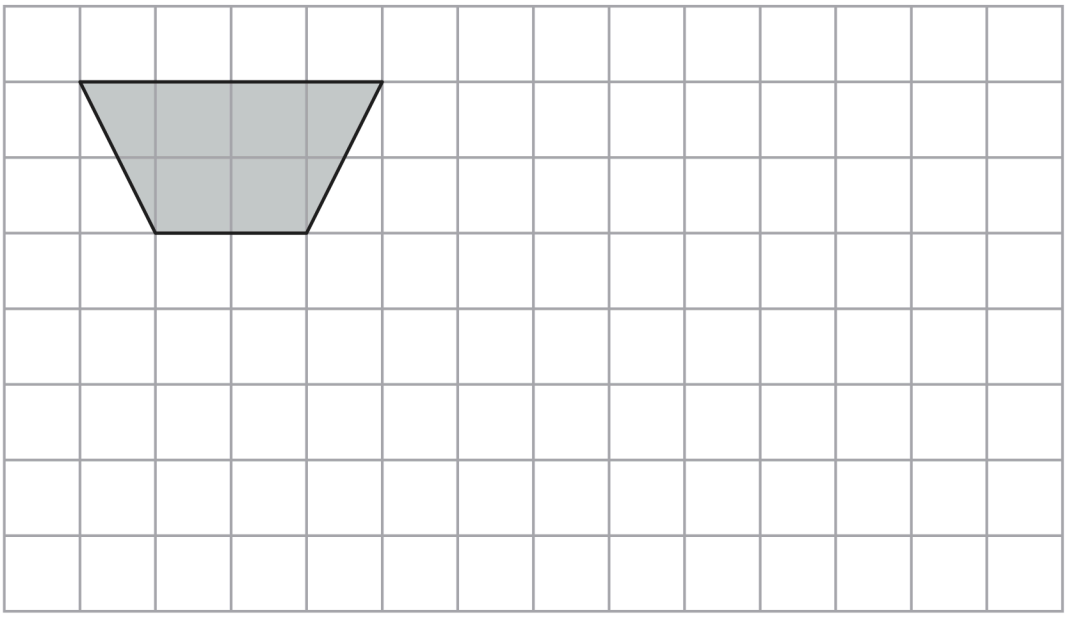
(d) What is the size of one interior angle?

..... °

(2)

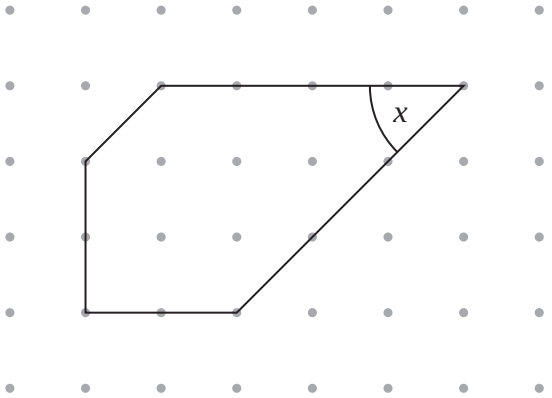
(Total for Question 3 is 5 marks)

13 On the grid, show how this shape will tessellate.
You should draw at least **six** shapes.



(Total for Question 13 is 2 marks)

8 Here is a 5-sided polygon on a dotted centimetre grid.



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

.....

(1)

(b) On the diagram, mark with arrows (>>) a pair of parallel lines.

(1)

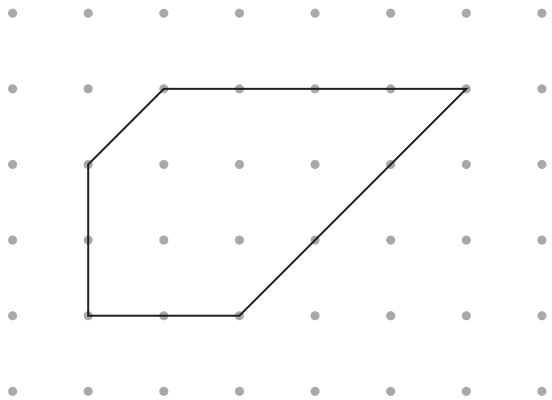
(c) What type of angle is the angle marked x?

.....

(1)

Here is the 5-sided polygon on a dotted centimetre grid.

(d) Work out the area of the 5-sided polygon.

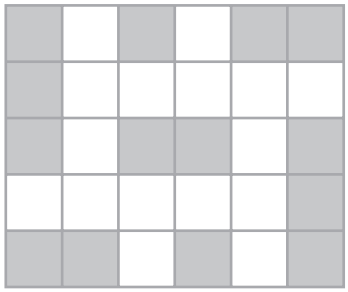


.....

(2)

(Total for Question 8 is 5 marks)

11



(a) What fraction of this shape is shaded?
Give your answer in its simplest form.

.....

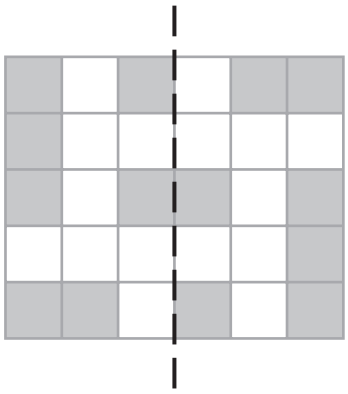
(2)

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

.....

(1)

(c) On the shape below, shade as few squares as possible so that the dotted line is a line of symmetry.



(2)

(Total for Question 11 is 5 marks)

13 5600 copies of the Village Advertiser are printed each week.

(a) Write the number 5600 in words.

.....

(1)

People have to pay to have an advert in the Village Advertiser.

Each advert is in the shape of a rectangle.

The table gives information about the cost of having an advert in the Village Advertiser.

Advert size	Size of rectangle	Cost per week
Size 1	44 mm by 27 mm	**£6.50**
Size 2	90 mm by 35 mm	**£13.50**
Size 3	90 mm by 60 mm	**£20.00**
Size 4	90 mm by 125 mm	**£33.00**

A Size 2 advert is a 90 mm by 35 mm rectangle.

(b) In the space below, draw a 90 mm by 35 mm rectangle.

(2)

David has this advert in the Village Advertiser for **2 weeks**.
The advert is accurately drawn.

Guitar Lessons
Lessons for beginners
Phone David on
01778 234525

(c) What is the total cost of the advert for 2 weeks?

£.....

(3)

Raja wants to have a Size 2 advert in the Village Advertiser for 8 weeks.
He has £100 to spend.

(d) Show that Raja does **not** have enough money to pay for the advert for 8 weeks.
You must show all your working.

(2)

(Total for Question 13 is 8 marks)

***16**

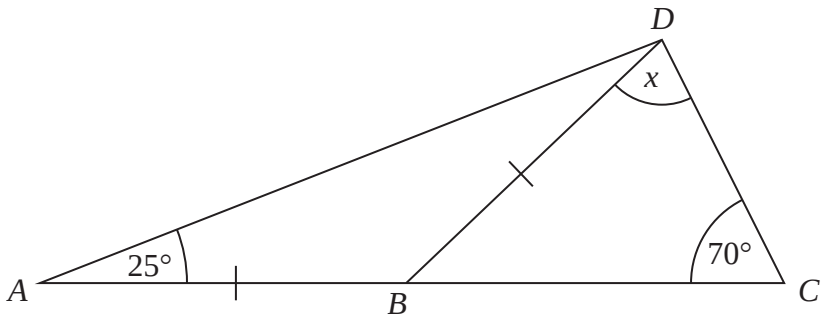


Diagram **NOT** accurately drawn

ABC is a straight line.
AB = *BD*
Angle *BAD* = 25°
Angle *BCD* = 70°

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

(Total for Question 16 is 4 marks)

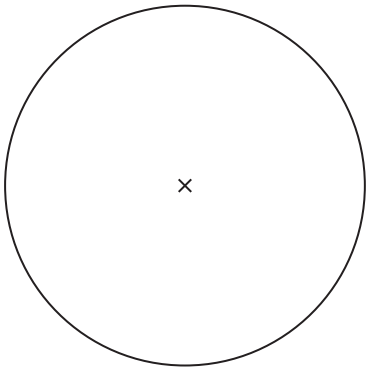
2 (a) In the space below, draw a straight line 10 cm long.

(1)

(b) Mark with a cross (×), the midpoint of the line below.

(1)

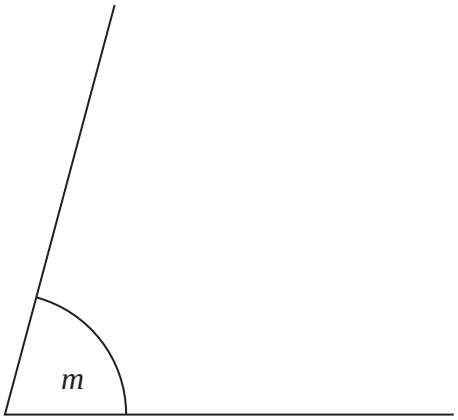
Here is a diagram of a circle, with centre marked ×.



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

(1)

(d) Measure the size of angle *m*.

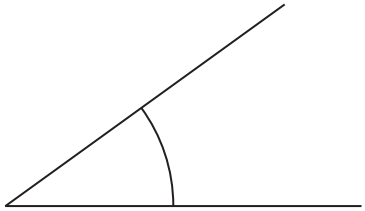


..... °

(1)

(Total for Question 2 is 4 marks)

3 Here is an angle.

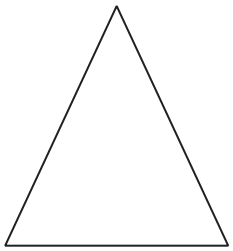


(a) Write down the mathematical name for this angle.

.....

(1)

The triangle below has exactly one line of symmetry.



(b) Draw the line of symmetry on this triangle.

(1)

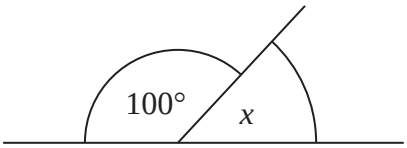


Diagram **NOT** accurately drawn

(c) Write down the size of the angle marked x.

.....°

(1)

(Total for Question 3 is 3 marks)

***15**

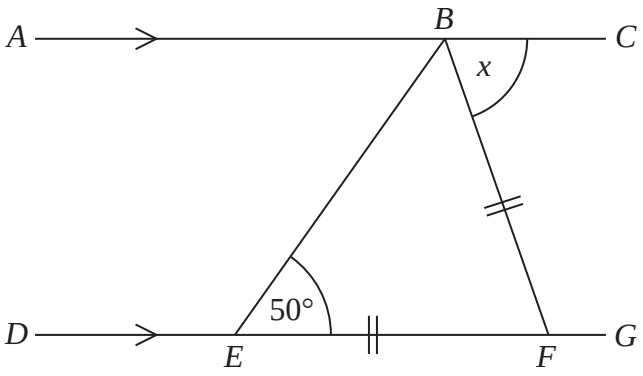


Diagram **NOT** accurately drawn

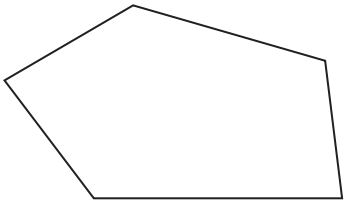
ABC is a straight line.
DEFG is a straight line.
AC is parallel to *DG*.
EF = *BF*.
Angle *BEF* = 50°.

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

.....°

(Total for Question 15 is 4 marks)

3 Here is a polygon.



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

.....

(1)

(b) Draw a sketch of a hexagon.

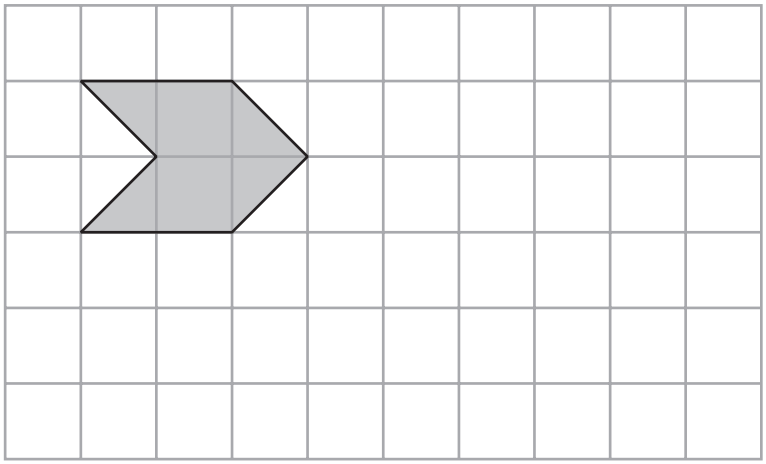
(1)

(c) In the space below, draw accurately a rectangle with a length of 5 cm and a width of 3 cm.

(2)

(Total for Question 3 is 4 marks)

15 On the grid, show how this shape will tessellate.
You should draw at least 6 shapes.

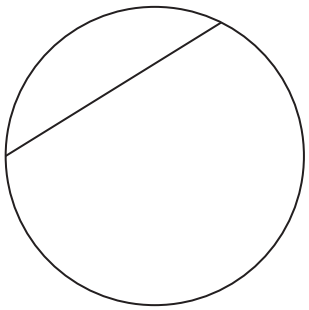


(Total for Question 15 is 2 marks)

2 (a) In the space below, draw a sketch of a rectangle.

(1)

(b)

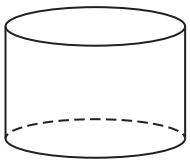


Write down the mathematical name for the straight line inside this circle.

.....

(1)

(c) Here is a solid shape.



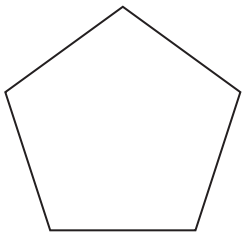
Write down the mathematical name for this solid shape.

.....

(1)

(Total for Question 2 is 3 marks)

3 Here is a regular pentagon.



A regular pentagon has rotational symmetry.

(a) Write down the order of rotational symmetry.

.....

(1)

(b) Draw a line of symmetry on this pentagon.

(1)

(Total for Question 3 is 2 marks)

5 Here is a list of names of some quadrilaterals.

square rectangle rhombus parallelogram trapezium

(a) Write down the names of the quadrilaterals that **must** have a right angle at each vertex.

.....

(1)

(b) Write down the names of the quadrilaterals that **must** have four sides the same length.

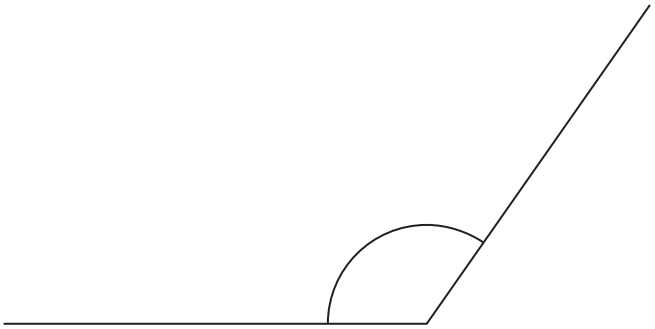
.....

(1)

(Total for Question 5 is 2 marks)

6 An angle is marked below.

(i) What type of angle is it?



.....

(ii) Measure the size of the angle.

.....°

(Total for Question 6 is 2 marks)

10

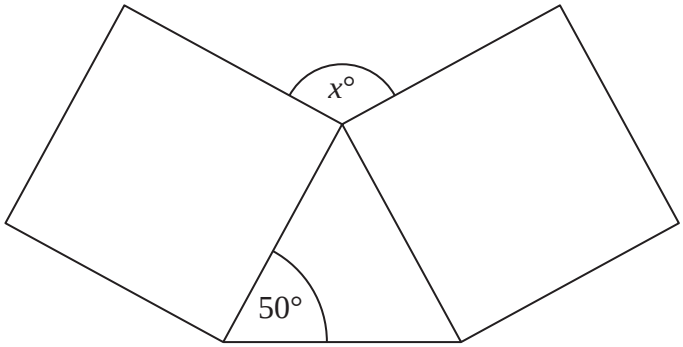


Diagram **NOT** accurately drawn

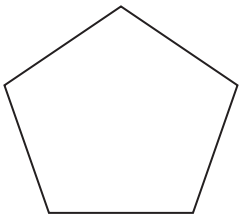
The diagram shows two identical squares and a triangle.

Find the size of the angle marked $x°$.

.....°

(Total for Question 10 is 4 marks)

2 Here is a polygon.



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

.....

(1)

(b) Write down the number of sides of a heptagon.

.....

(1)

The diagram shows a quadrilateral.

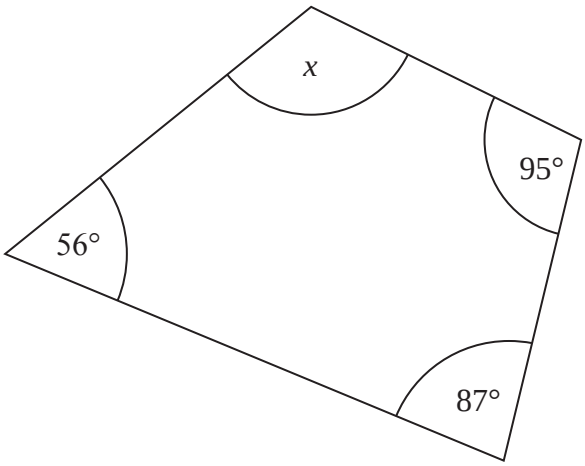


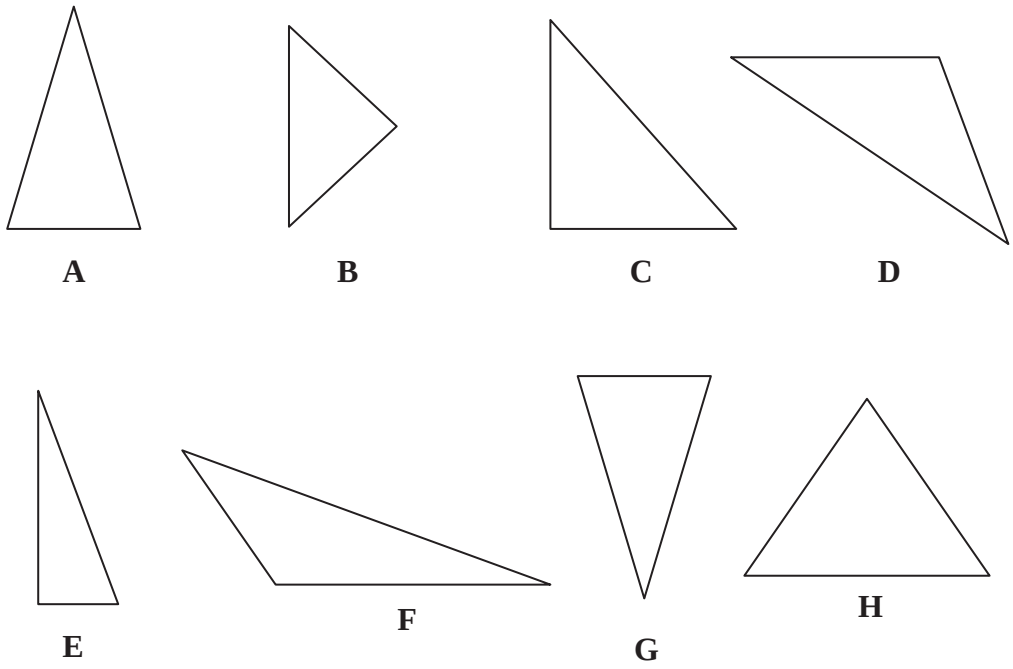
Diagram **NOT** accurately drawn

(c) Work out the size of the angle marked x.

.....°

(2)

Here are eight triangles.



Two of these triangles are congruent.

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

..... and .....

(1)

(Total for Question 2 is 5 marks)

20

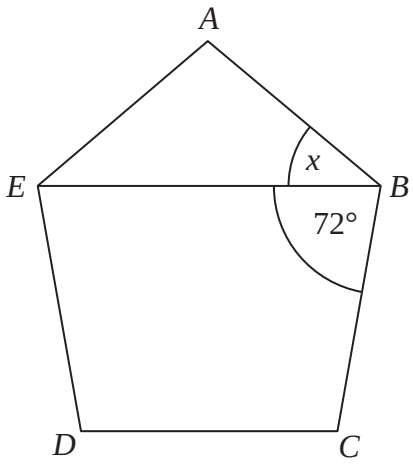


Diagram **NOT** accurately drawn

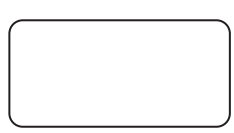
ABCDE is a regular polygon.
EB is a straight line.
Angle *EBC* = 72°.

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

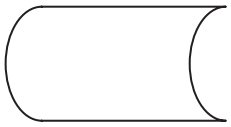
..... °

(Total for Question 20 is 3 marks)

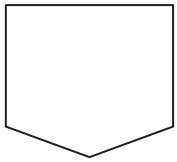
5 Here are nine shapes.



A



B



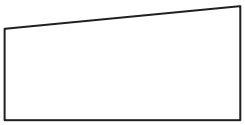
C



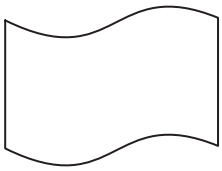
D



E



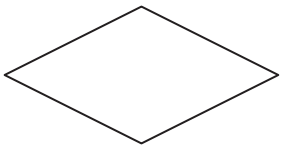
F



G



H



I

(a) Write down the letter of a shape that has exactly one line of symmetry.

.....

(1)

Two of these shapes have rotational symmetry of order 2 and no lines of symmetry.

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

..... and .....

(2)

Shape **D** is a polygon.

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

.....

(1)

Shape **E** is a quadrilateral.

(d) Write down the mathematical name of this type of quadrilateral.

.....

(1)

(Total for Question 5 is 5 marks)

***22**

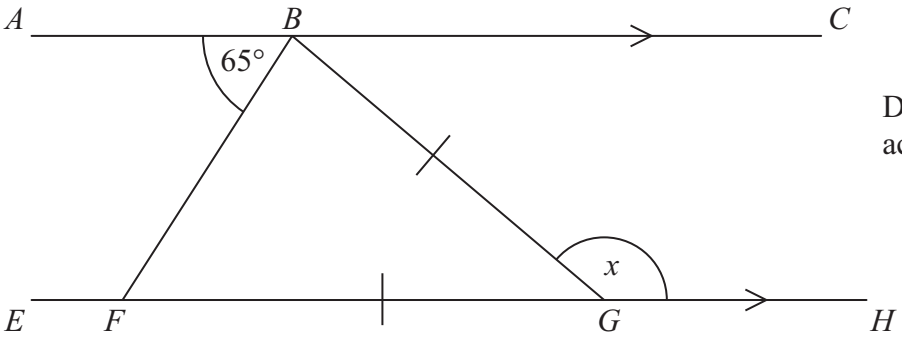


Diagram **NOT** accurately drawn

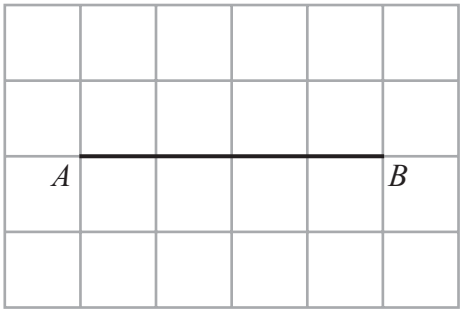
ABC is parallel to *EFGH*.

GB = *GF*
Angle *ABF* = 65°

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

(Total for Question 22 is 4 marks)

4 (a) On the grid below, draw a line that is perpendicular to the line AB.



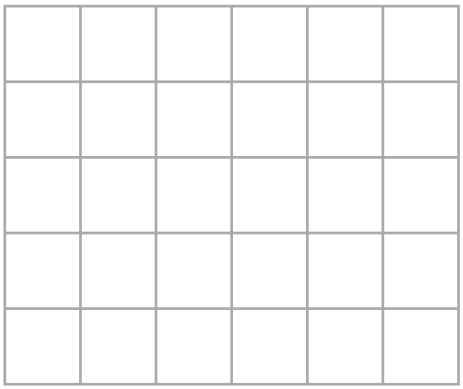
(1)

(b) In the space below, draw accurately a circle of radius 4 cm.
Use the point C as the centre of your circle.



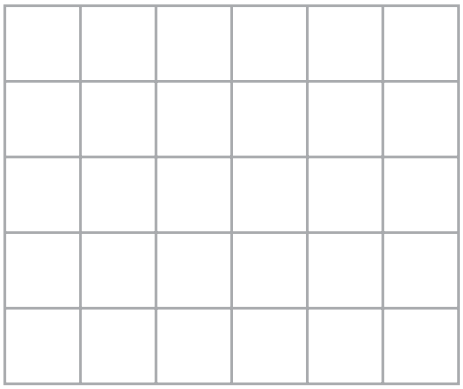
(1)

(c) On the grid below, draw an isosceles triangle.



(1)

(d) On the grid below, draw a quadrilateral with exactly 2 right angles.



(1)

(Total for Question 4 is 4 marks)

***15**

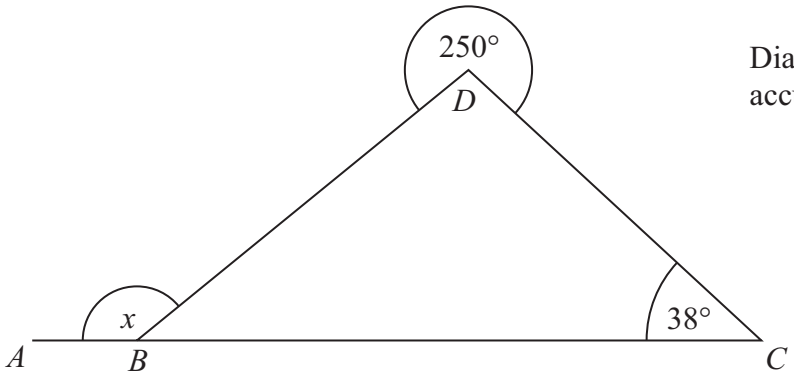


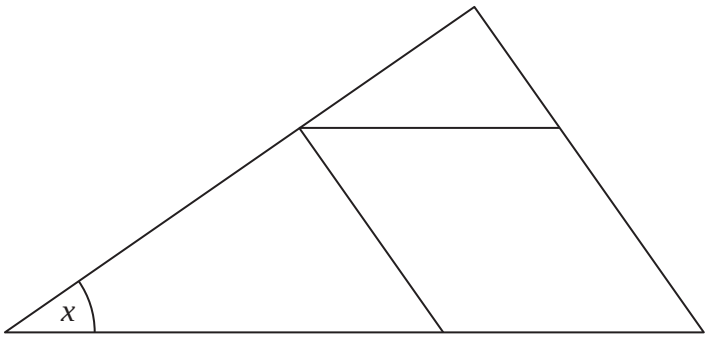
Diagram **NOT** accurately drawn

ABC is a straight line.
Angle *BCD* = 38°
The reflex angle *BDC* = 250°

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

(Total for Question 15 is 4 marks)

5



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

(1)

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

(1)

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

..... °

(1)

(Total for Question 5 is 3 marks)

***18**

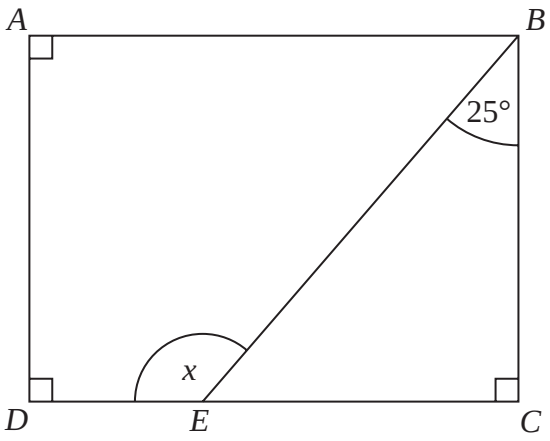


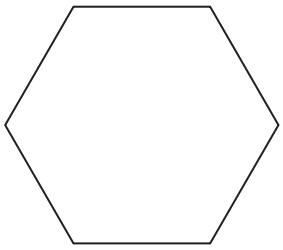
Diagram **NOT** accurately drawn

ABCD is a rectangle.
E is a point on *DC*.
Angle *EBC* = 25°

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

(Total for Question 18 is 3 marks)

2



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

.....

(1)

(b) How many sides has an octagon?

.....

(1)

(Total for Question 2 is 2 marks)

7 Here is a triangle.

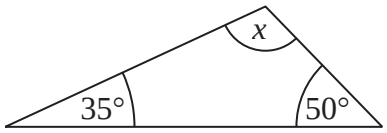


Diagram **NOT** accurately drawn

(a) (i) Work out the size of the angle marked x.

.....°

(ii) Give a reason for your answer.

.....

.....

(2)

Here is a different triangle.

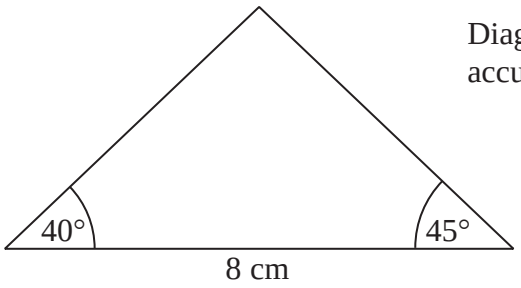


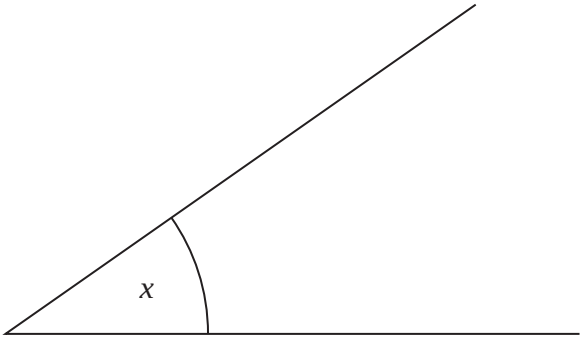
Diagram **NOT** accurately drawn

(b) In the space below, make an accurate drawing of this triangle.

(3)

(Total for Question 7 is 5 marks)

4



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

..... °

(1)

(b)

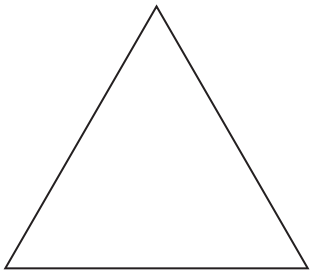


On the line, mark with a cross (×) the point 6.4 cm from the point P.

(1)

(Total for Question 4 is 2 marks)

2 Here is an equilateral triangle.

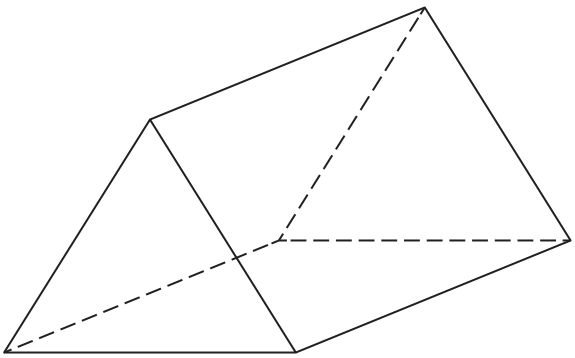


(a) Write down the order of rotational symmetry of the triangle.

.....

(1)

Here is a solid prism.



(b) (i) Write down the number of faces of the prism.

.....

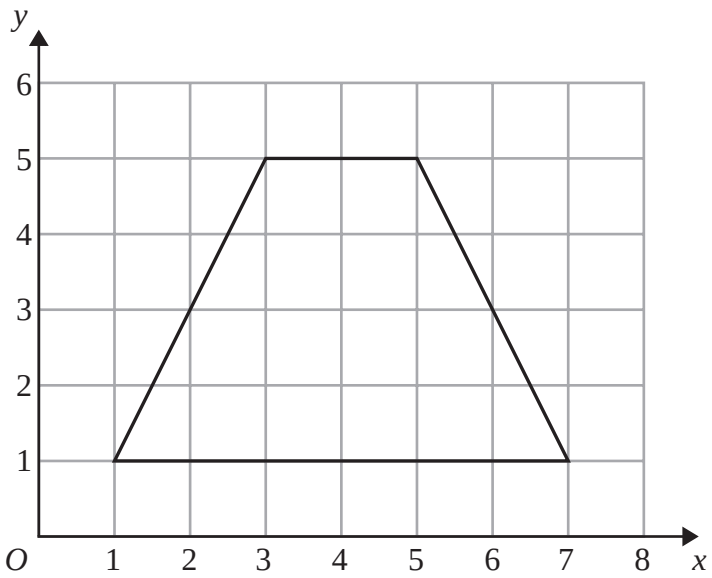
(ii) Write down the number of edges of the prism.

.....

(2)

(Total for Question 2 is 3 marks)

8 A quadrilateral is drawn on the grid.



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

.....

(1)

(b) On the grid, draw the line of symmetry of the quadrilateral.

(1)

(c) On the grid, mark with a cross (×) the point (3, 4).

Label this point *P*.

(1)

(Total for Question 8 is 3 marks)

***15**

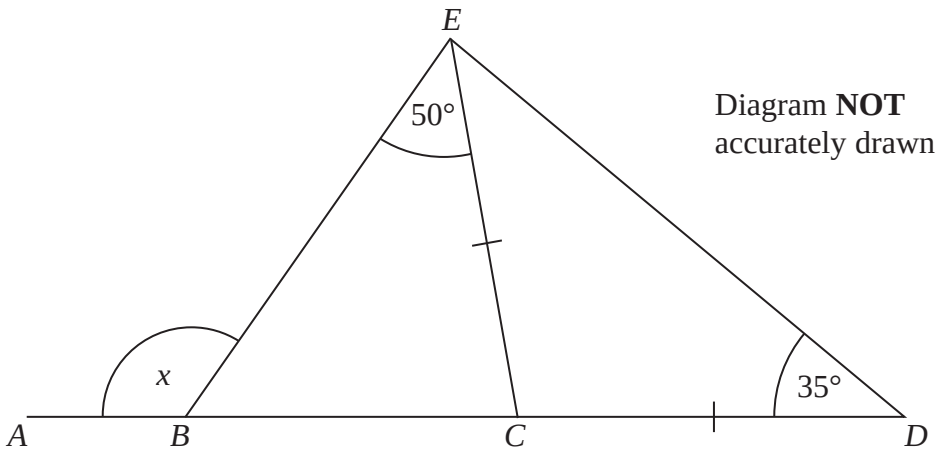


Diagram **NOT** accurately drawn

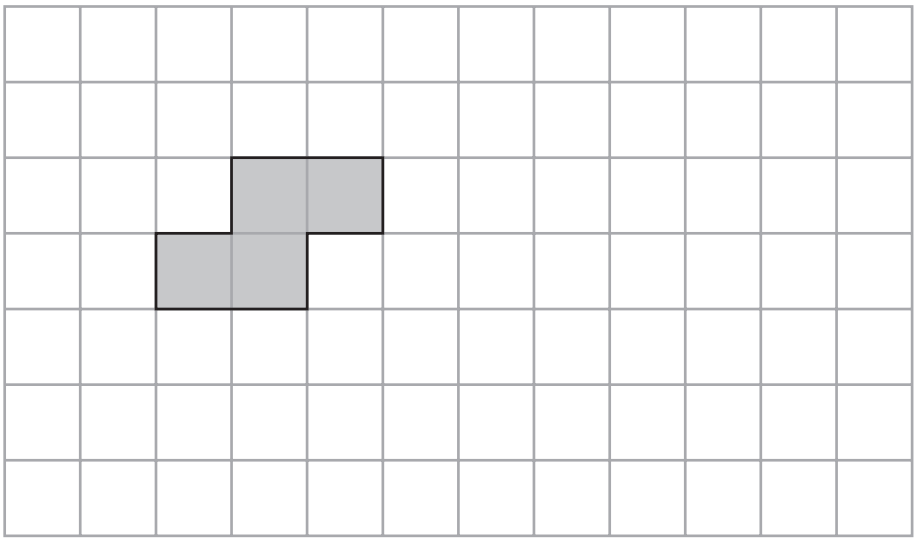
ABCD is a straight line.
CE = *CD*
Angle *BEC* = 50°
Angle *CDE* = 35°

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

You must give reasons for your answer.

(Total for Question 15 is 4 marks)

13 On the grid, show how this shape will tessellate.
You should draw at least 8 more shapes.



(Total for Question 13 is 2 marks)

4

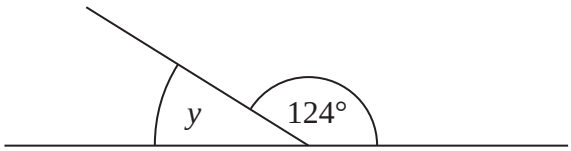


Diagram **NOT** accurately drawn

(a) (i) Work out the size of the angle marked y.

.....°

(ii) Give a reason for your answer.

.....

(2)

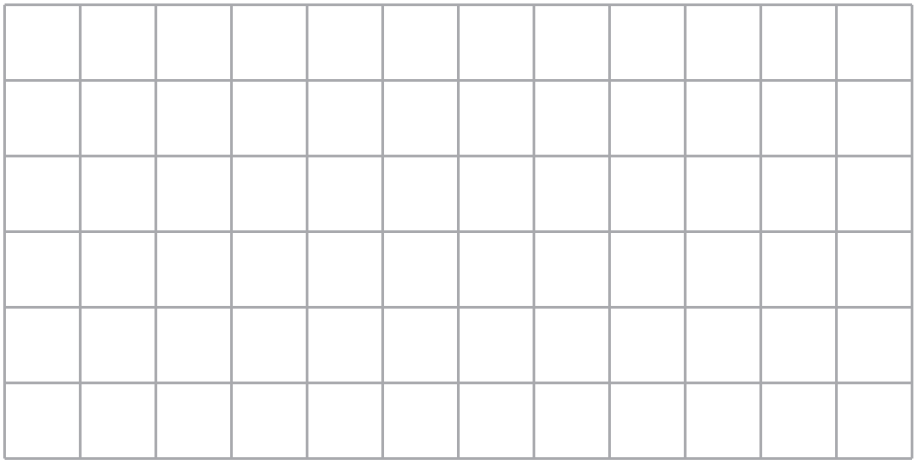
A quadrilateral has four angles.
Each angle is 90°

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

.....

(1)

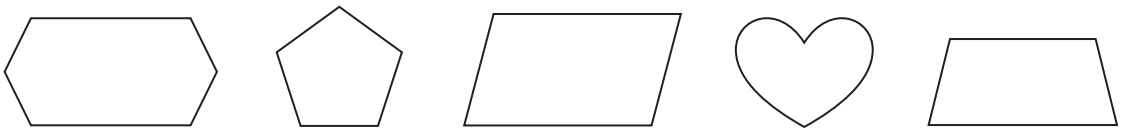
(c) On the grid of centimetre squares, draw a kite.



(1)

(Total for Question 4 is 4 marks)

7 Here are five shapes.



Shape E is a quadrilateral.

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

.....

(1)

One of these shapes has exactly **two** lines of symmetry.

(b) Write down the letter of this shape.

.....

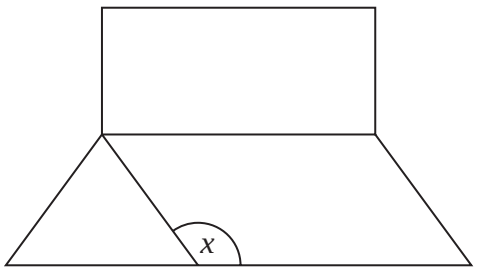
(1)

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

.....

(1)

The diagram below shows a rectangle, a parallelogram and a triangle.



(d) Mark with arrows (>>) a pair of parallel lines.

(1)

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

.....

(1)

(Total for Question 7 is 5 marks)

13 Here is a rectangle.

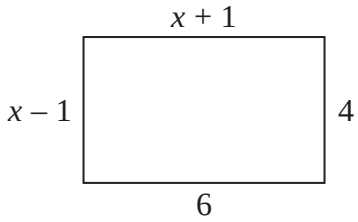


Diagram **NOT** accurately drawn

All measurements on the diagram are in centimetres.

(a) Find the value of x.

.....

(2)

Here is a triangle.

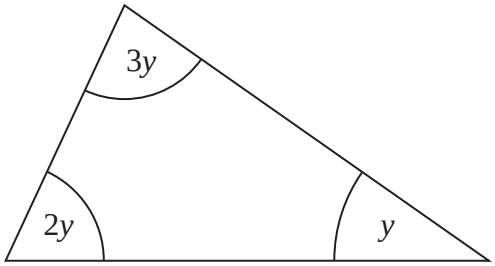


Diagram **NOT** accurately drawn

(b) Find the size of the angle marked y.

.....°

(2)

(Total for Question 13 is 4 marks)

16 Here is a quadrilateral.

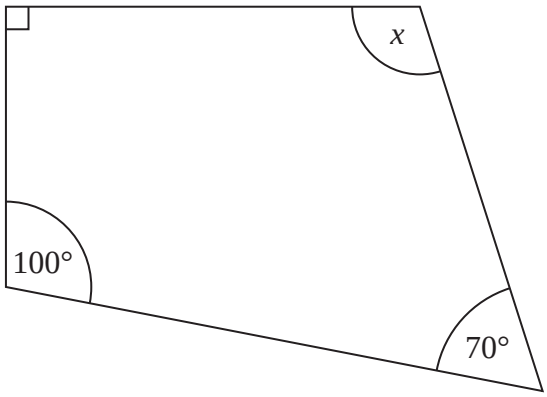


Diagram **NOT** accurately drawn

*(a) Explain why the angle marked x **cannot** be a right angle.

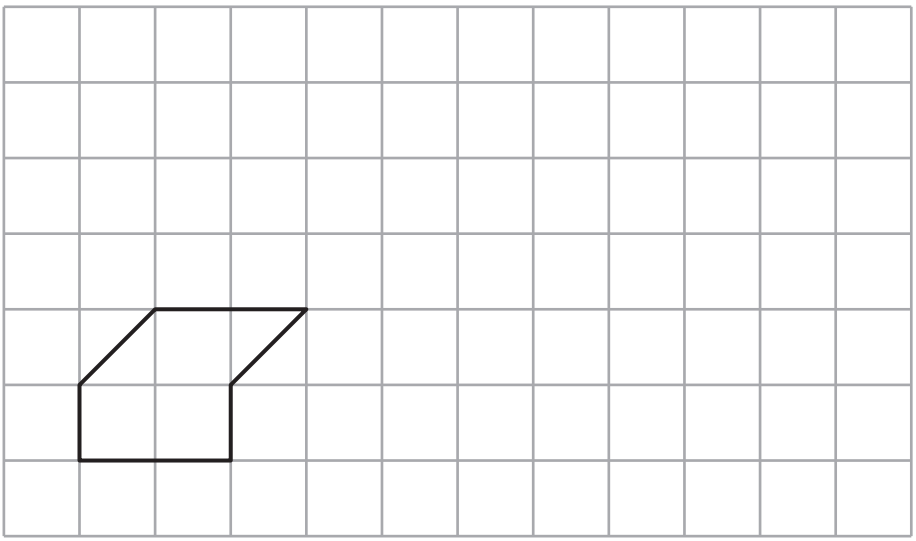
.....

.....

.....

(3)

(b) On the grid below, show how the shape tessellates.
You should draw at least **6** shapes.



(2)

(Total for Question 16 is 5 marks)

***20**

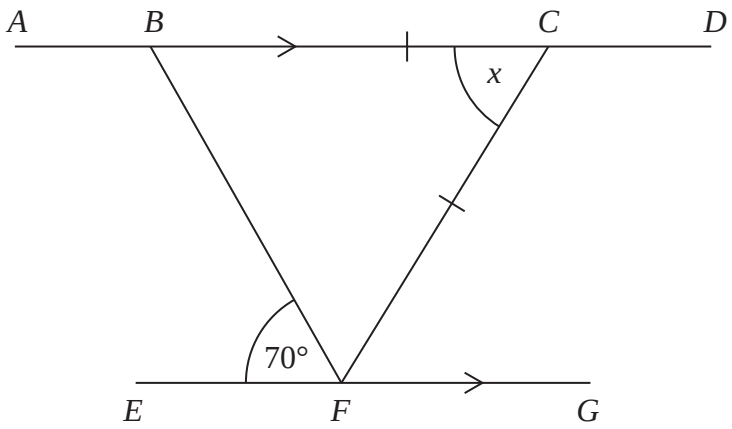


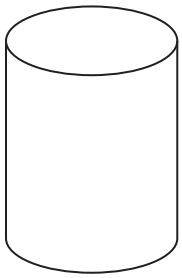
Diagram **NOT** accurately drawn

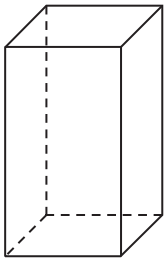
ABCD and *EFG* are parallel lines.
BC = *CF*
Angle *BFE* = 70°

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

(Total for Question 20 is 4 marks)

1 Write down the mathematical name of each of these 3-D shapes.





(i) .....

(ii) .....

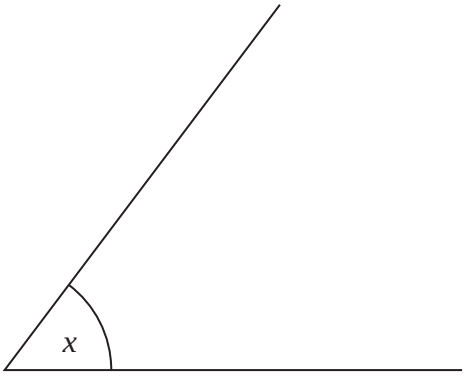
(Total for Question 1 is 2 marks)

5 (a) Measure the length of the line *AB*.



.....

(2)



(b) (i) Write down the special name for the angle marked *x*.

.....

(ii) Measure the size of the angle marked *x*.

..... °

(2)

(Total for Question 5 is 4 marks)

7 Here is a quadrilateral.



(a) Write down the mathematical name for this quadrilateral.

.....

(1)

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

.....

(1)

(Total for Question 7 is 2 marks)

***16** This shape is made from an equilateral triangle and 3 identical isosceles triangles.

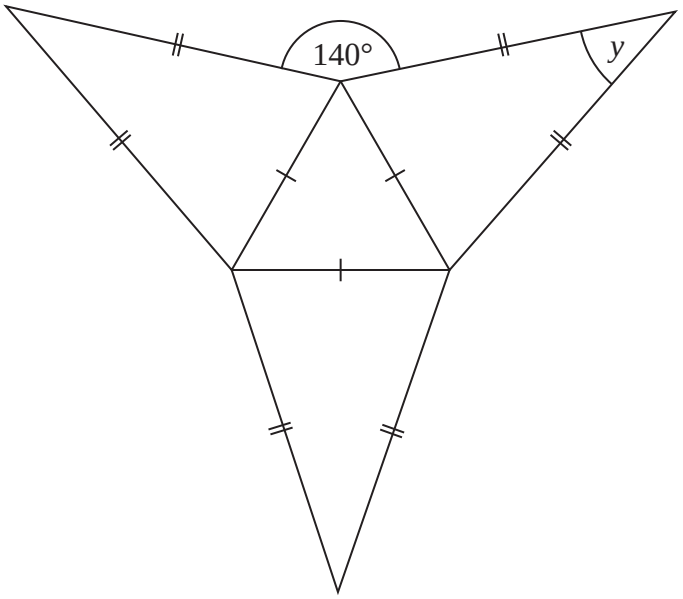
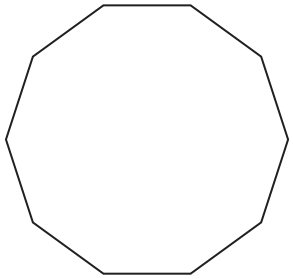


Diagram **NOT** accurately drawn

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

(Total for Question 16 is 4 marks)

8 Here is a regular 10-sided polygon.



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

.....

(1)

One of the interior angles of this regular polygon is 144°

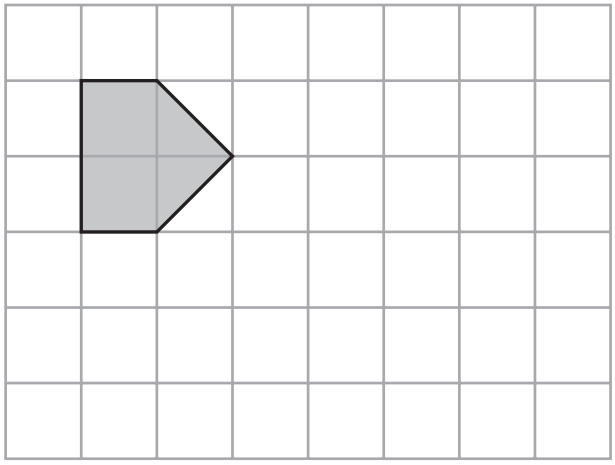
(b) Work out the sum of the interior angles of the polygon.

.....°

(1)

(Total for Question 8 is 2 marks)

19 A shape is drawn on the grid.



On the grid, show how this shape will tessellate.

You should draw at least 8 shapes.

(Total for Question 19 is 2 marks)

7 Here is a quadrilateral.



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

.....

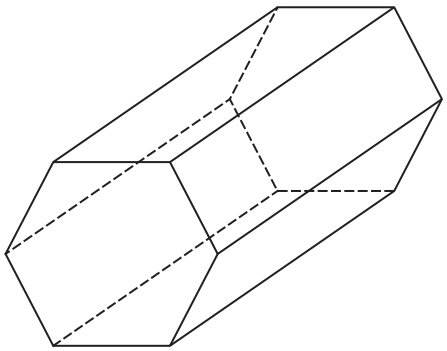
(1)

(b) In the space below, sketch a cuboid.

(1)

(Total for Question 7 is 2 marks)

19 The diagram shows a prism.



(a) (i) Write down how many vertices the prism has.

.....

(ii) Write down how many faces the prism has.

.....

(2)

The cross section of the prism is a regular hexagon.

(b) In the space below, sketch a net of the prism.

(2)

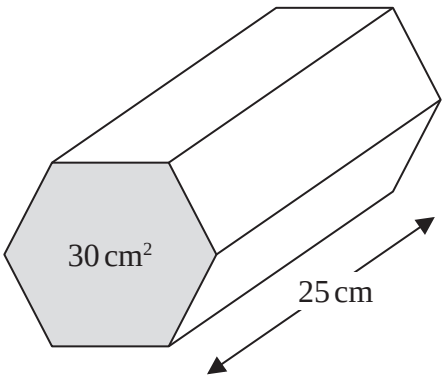


Diagram **NOT** accurately drawn

The area of the cross section of the prism is 30 cm^2.
The length of the prism is 25 cm.

(c) Work out the volume of the prism.

.....

(3)

(Total for Question 19 is 7 marks)

3 Here is a parallelogram.

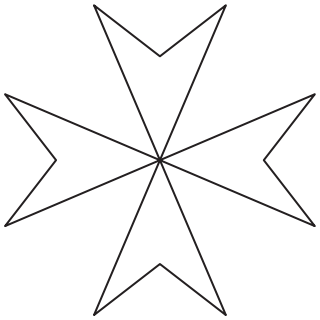


(a) Write down the order of rotational symmetry of this parallelogram.

.....

(1)

Here is a shape.



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

(2)

(Total for Question 3 is 3 marks)

***25**

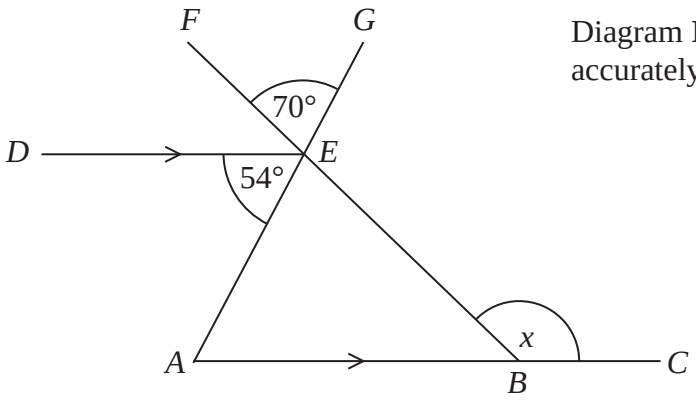


Diagram **NOT** accurately drawn

ABC and *DE* are parallel lines.
AEG and *BEF* are straight lines.

Angle *AED* = 54°
Angle *FEG* = 70°

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

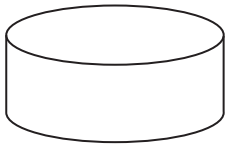
(Total for Question 25 is 4 marks)

2 (a) Write down the name of a quadrilateral that has 4 right angles.

.....

(1)

The diagram shows a solid shape.



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

.....

(1)

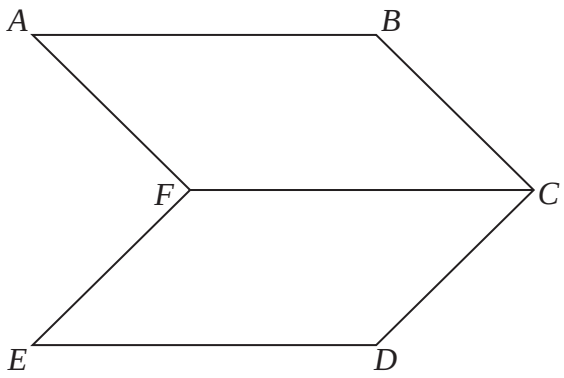
(c) In the space below, draw accurately a circle of radius 4 cm.
Use the cross (×) as the centre of your circle.

×

(1)

(Total for Question 2 is 3 marks)

4 The diagram shows two parallelograms.



(a) Measure the length of the line *AB*.
Give your answer in cm.

..... cm

(1)

(b) Mark with arrows (>>) one pair of parallel lines.

(1)

(c) Mark with the letter *x* an acute angle.

(1)

(d) Mark with the letter *y* the angle *EDC*.

(1)

(Total for Question 4 is 4 marks)

6

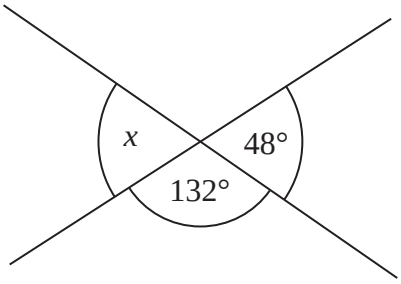


Diagram **NOT** accurately drawn

(a) Write down the size of the angle marked x.

.....°

(1)

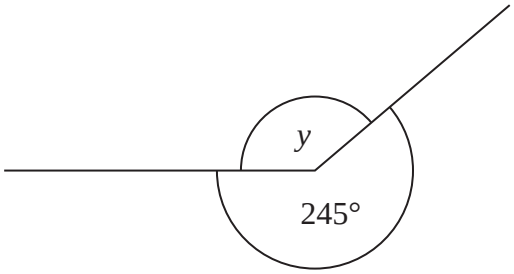


Diagram **NOT** accurately drawn

(b) Work out the size of the angle marked y.

.....°

(1)

(Total for Question 6 is 2 marks)

18

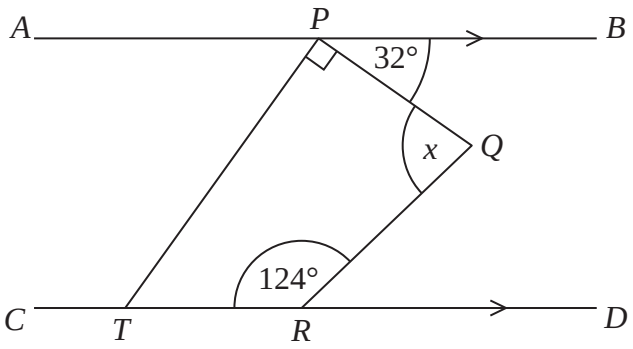


Diagram **NOT** accurately drawn

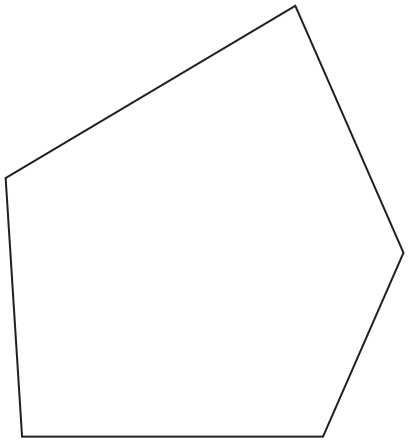
APB is parallel to *CTRD*.
PQRT is a quadrilateral.

Work out the size of the angle marked *x*.
You must show your working.

.....°

(Total for Question 18 is 4 marks)

5 Here is a polygon.



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

.....

(1)

Here is a straight line.

(b) In the space above, draw a line parallel to this line.

(1)

(Total for Question 5 is 2 marks)

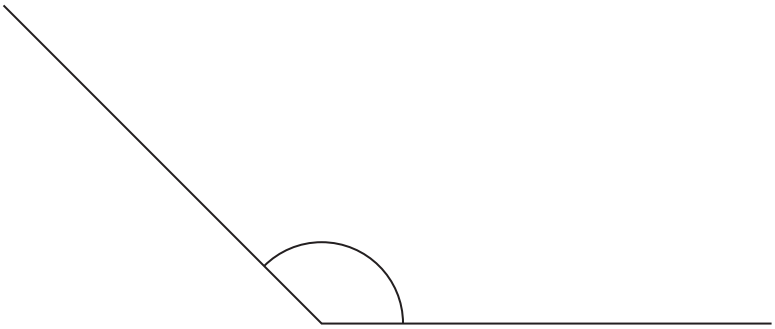
2 (a) Measure the length of the line *AB*.
Give your answer in centimetres.



..... cm

(1)

An angle is marked in this diagram.



(b) Write down the special name for this type of angle.

.....

(1)

(c) Measure the size of the angle.

..... °

(1)

(Total for Question 2 is 3 marks)

16

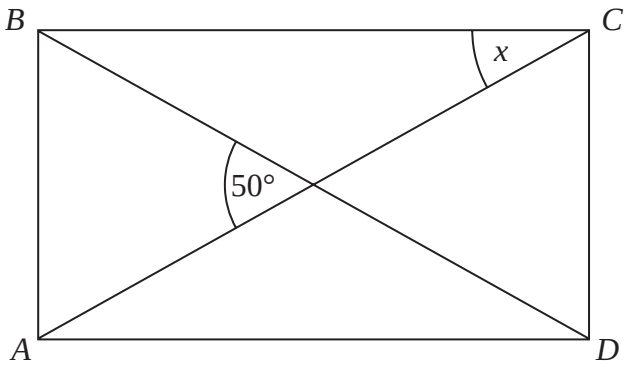


Diagram **NOT** accurately drawn

ABCD is a rectangle.
AC and *BD* are straight lines.
The angle between *AC* and *BD* is 50º.

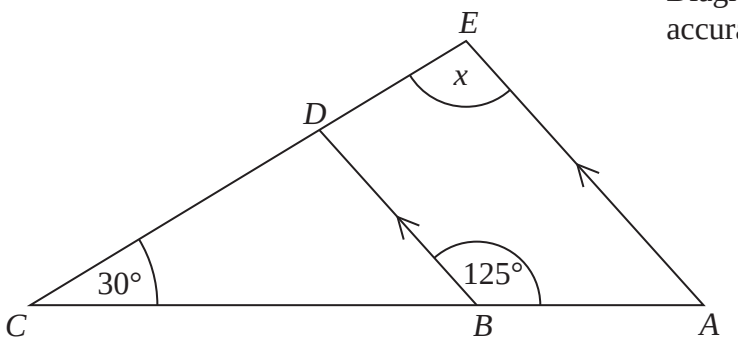
Work out the size of the angle marked *x*.

.....°

(Total for Question 16 is 3 marks)

***25**

Diagram **NOT** accurately drawn

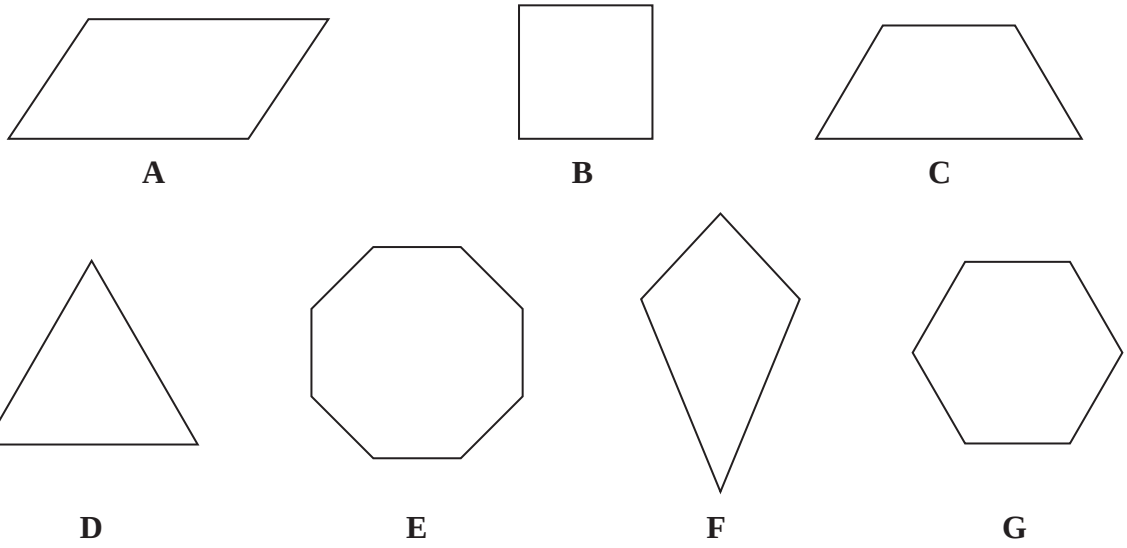


ABC and *EDC* are straight lines.
AE and *BD* are parallel.
Angle *ABD* = 125°
Angle *BCD* = 30°

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

(Total for Question 25 is 4 marks)

4 Here are seven shapes.



One of these shapes is a hexagon.

(a) Write down the letter of this shape.

.....

(1)

One of these shapes has no lines of symmetry.

(b) Write down the letter of this shape.

.....

(1)

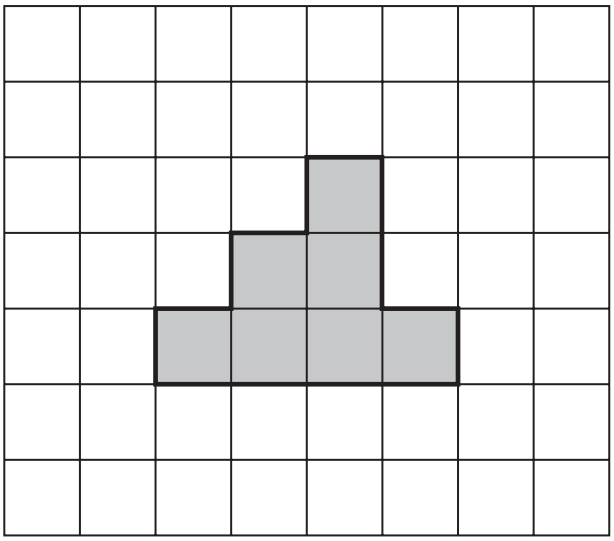
(c) Write down the order of rotational symmetry of shape **E**.

.....

(1)

(Total for Question 4 is 3 marks)

11 Here is a shaded shape drawn on a centimetre grid.



(a) Work out the perimeter of this shape.

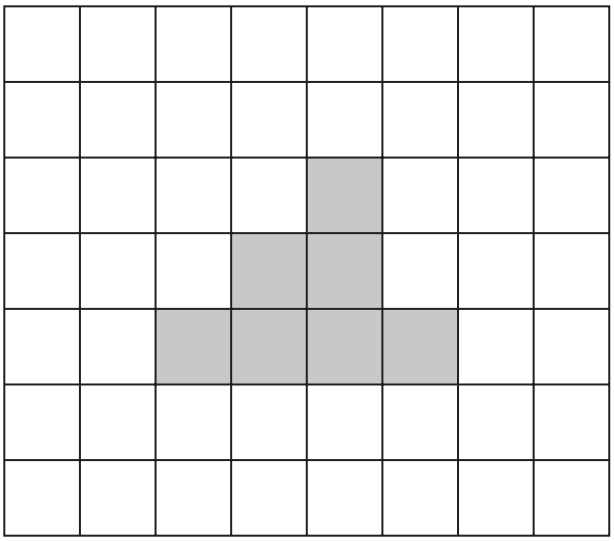
.....

(2)

(b) What fraction of the grid is shaded?
Give your answer in its simplest form.

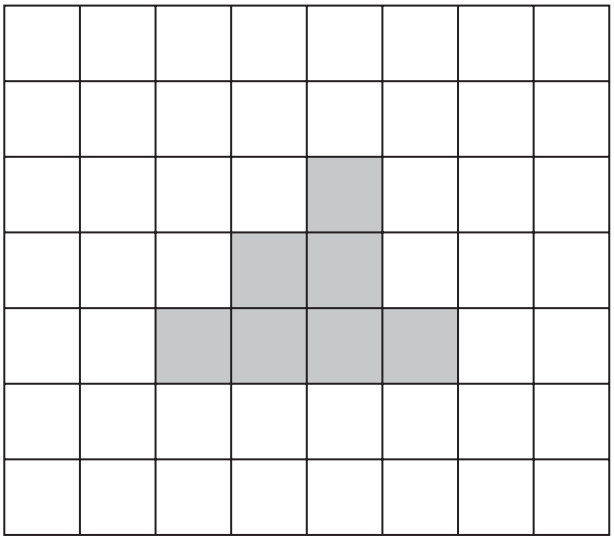
.....

(2)



(c) On the grid above, shade in 3 more squares so that the completed shape has exactly one line of symmetry.

(1)

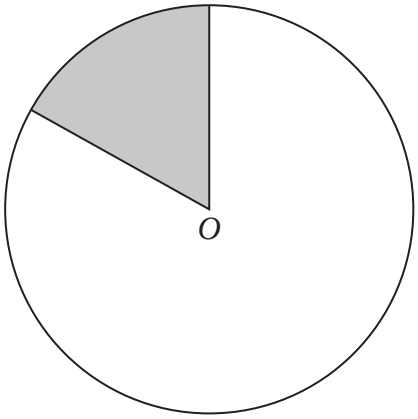


(d) On this grid, shade in 3 more squares so that the completed shape has rotational symmetry of order 2

(1)

(Total for Question 11 is 6 marks)

6 Here is a circle, centre O.

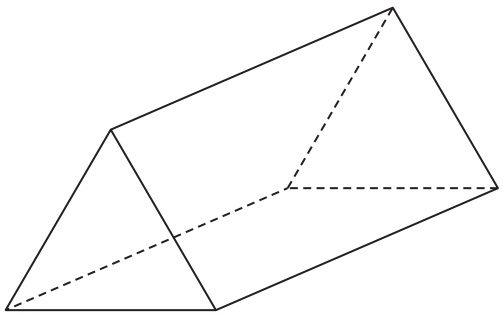


(a) Write down the mathematical name for the shaded region.

.....

(1)

Here is a 3-D shape.



(b) (i) Write down the mathematical name for the shape.

.....

(ii) How many faces does the shape have?

.....

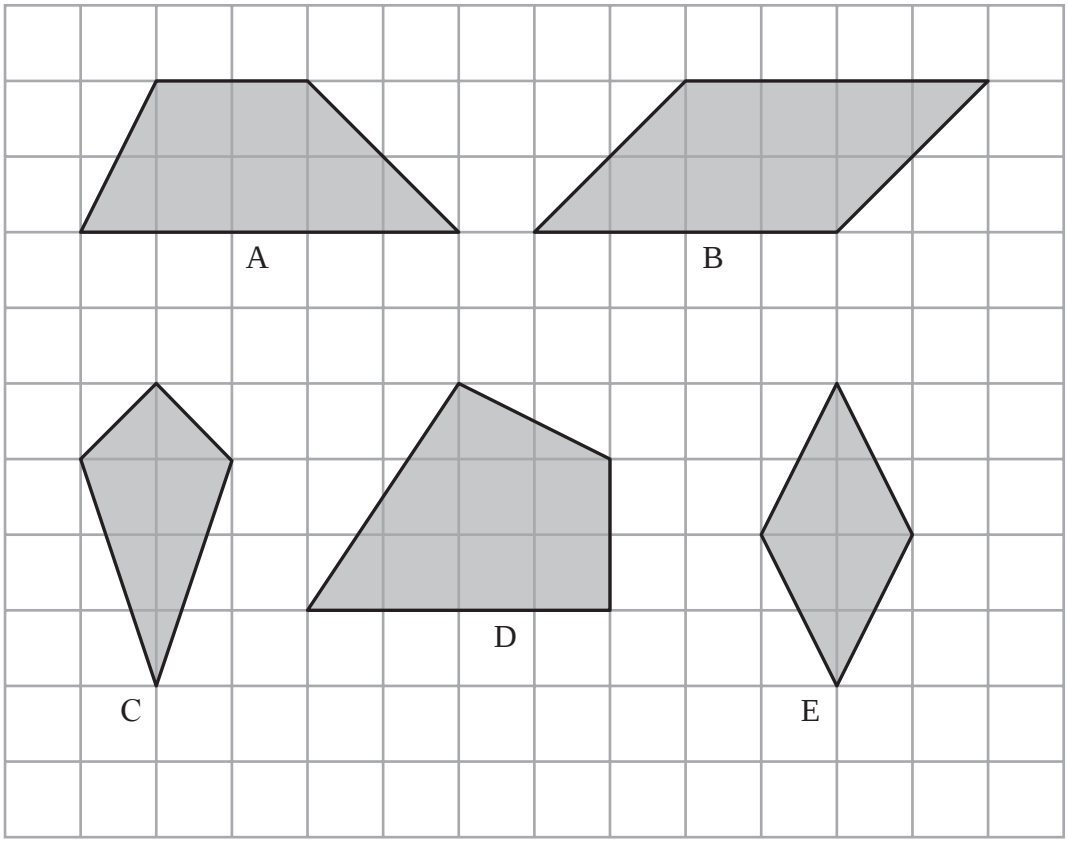
(iii) How many vertices does the shape have?

.....

(3)

(Total for Question 6 is 4 marks)

10 Here are five shapes on a grid of squares.



(a) Write down the letter of the shape that is a rhombus.

.....

(1)

(b) How many lines of symmetry does shape C have?

.....

(1)

Two of the shapes have rotational symmetry of order 2

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

..... and .....

(1)

(Total for Question 10 is 3 marks)

***12**

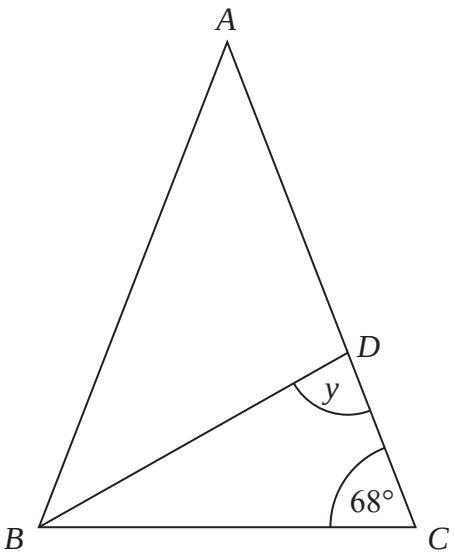


Diagram **NOT** accurately drawn

ABC and *ABD* are both isosceles triangles.
AB = *AC*
DA = *DB*

Work out the size of angle *y*.
You must give reasons for your answer.

(Total for Question 12 is 4 marks)

1 Here is a straight line.

(a) Draw a line at least 5 cm long that is parallel to the straight line.

(1)

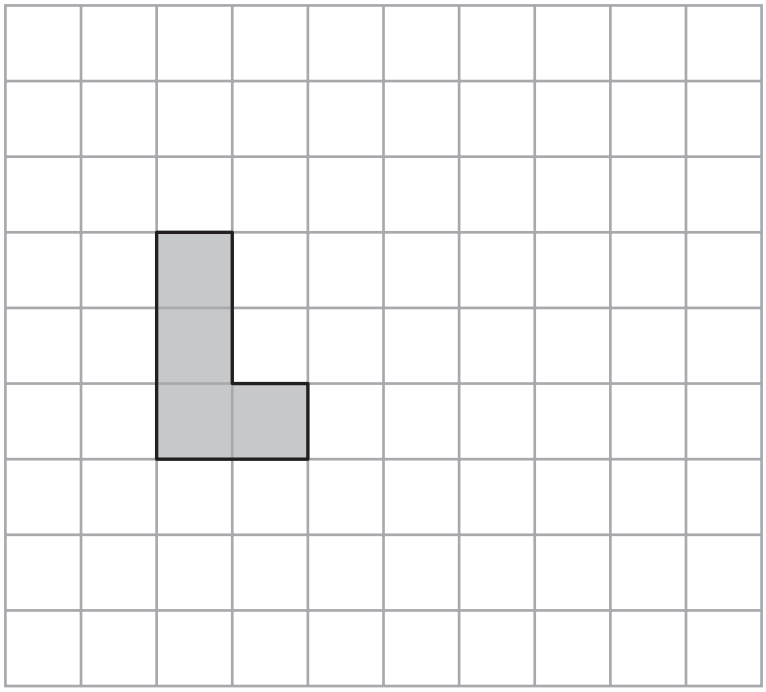
(b) Draw a circle of radius 4 cm.
Use the cross (×) as the centre of your circle.

×

(1)

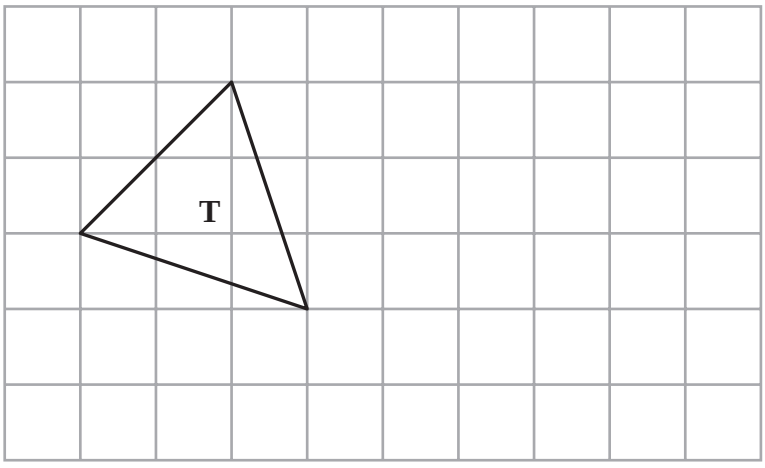
(Total for Question 1 is 2 marks)

15 (a) On the grid, show how the shaded shape will tessellate.
You should draw at least **six** more shapes.



(2)

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

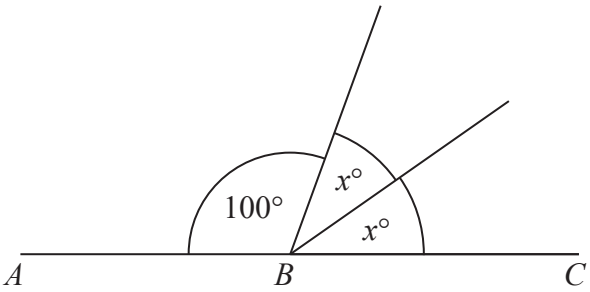


(1)

(Total for Question 15 is 3 marks)

6

Diagram **NOT** accurately drawn



ABC is a straight line.

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

x = ...

(2)

Here is a sketch of a triangle *PQR*.

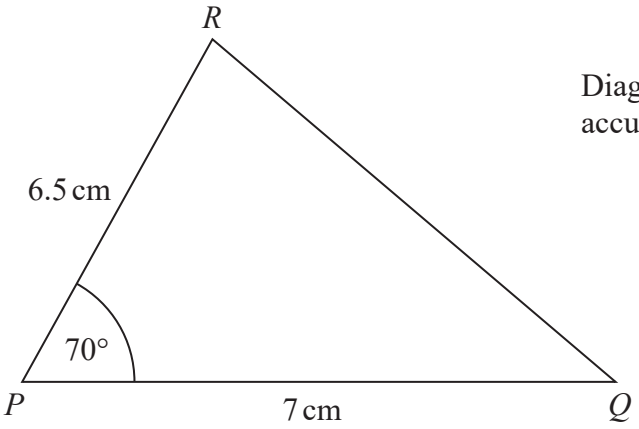


Diagram **NOT** accurately drawn

(b) What type of angle is the angle *QPR*?

.....

(1)

(c) In the space below, make an accurate drawing of triangle PQR.
The line PQ has been drawn for you.



(2)

(Total for Question 6 is 5 marks)

***17** ABC is an isosceles triangle.

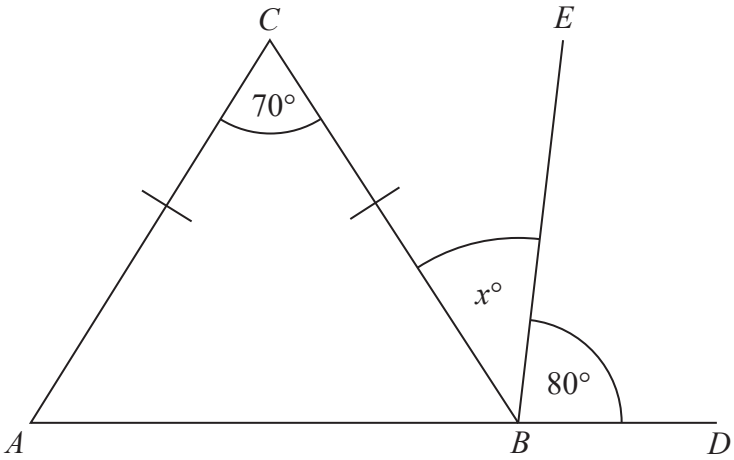


Diagram **NOT** accurately drawn

$AC = BC$
ABD is a straight line.

Angle $ACB = 70°$
Angle $EBD = 80°$

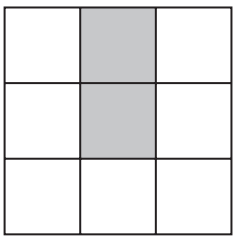
Angle $CBE = x°$

Work out the value of x.
Give reasons for your answer.

(Total for Question 17 is 4 marks)

8 On the grid below, two squares are shaded.

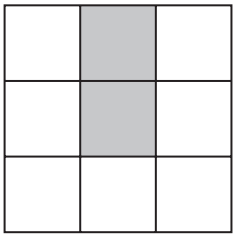
(a) Shade **three** more squares to make a shaded shape that has exactly one line of symmetry.



(1)

On the grid below, two squares are shaded.

(b) Shade **three** more squares to make a shaded shape that has rotational symmetry of order 2



(1)

(Total for Question 8 is 2 marks)

Question 125

June 2017 | 1MA1/3F | Original Q13

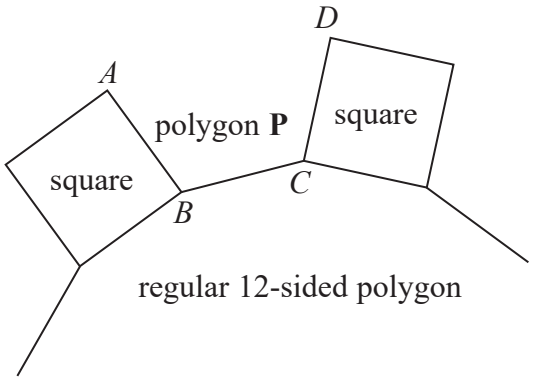
13 The size of the largest angle in a triangle is 4 times the size of the smallest angle.
The other angle is 27° less than the largest angle.

Work out, in degrees, the size of each angle in the triangle.
You must show your working.

..... ° , ... ° , ... °

(Total for Question 13 is 5 marks)

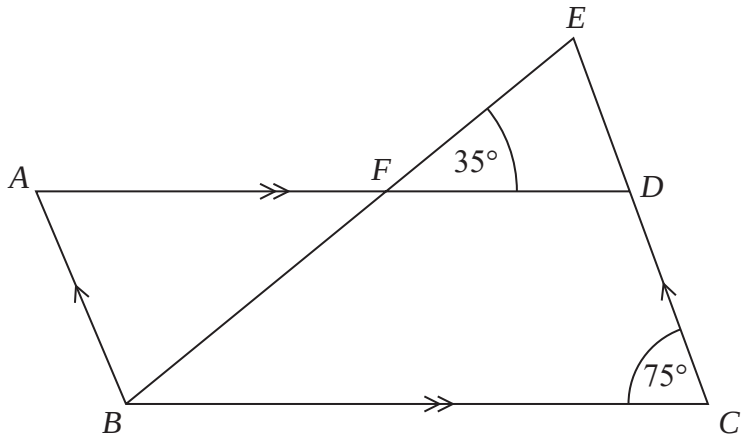
19 In the diagram, AB, BC and CD are three sides of a regular polygon **P**.



Show that polygon **P** is a hexagon.
You must show your working.

(Total for Question 19 is 4 marks)

25



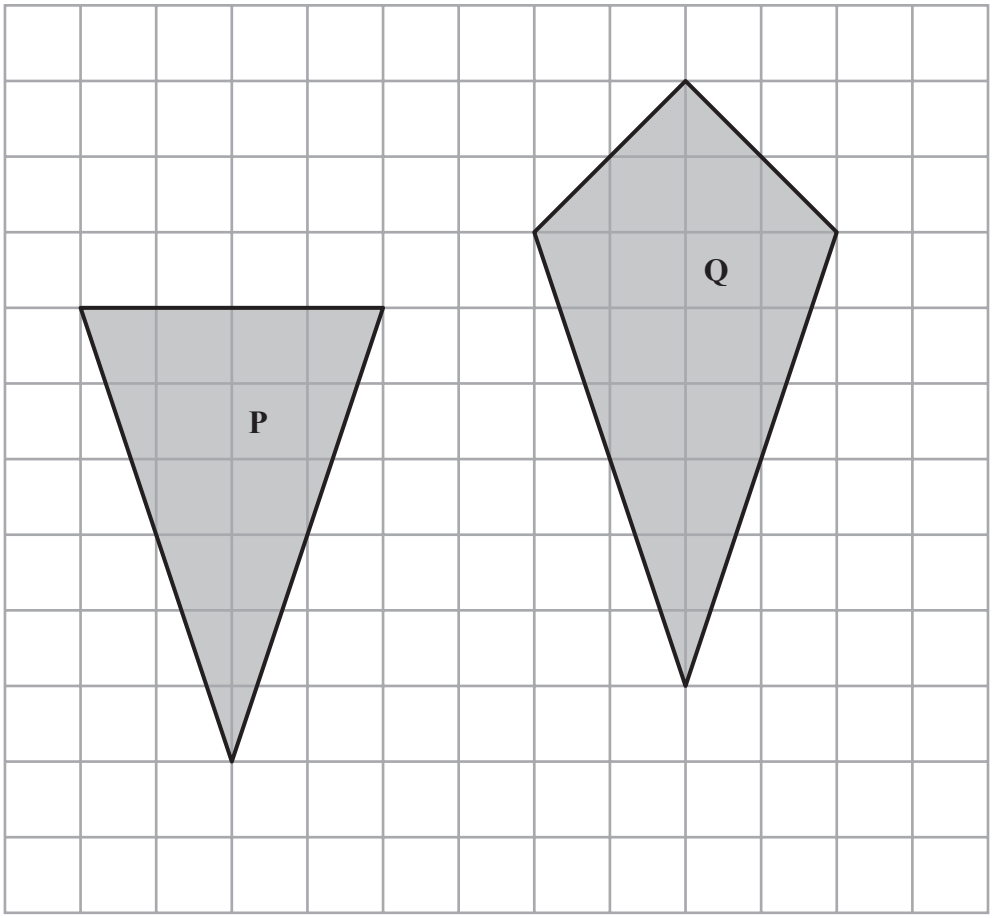
ABCD is a parallelogram.
EDC is a straight line.
F is the point on *AD* so that *BFE* is a straight line.

Angle *EFD* = 35°
Angle *DCB* = 75°

Show that angle *ABF* = 70°
Give a reason for each stage of your working.

(Total for Question 25 is 4 marks)

10 The diagram shows two shapes drawn on a centimetre grid.



(a) Find the area of shape **P**.

.....

(2)

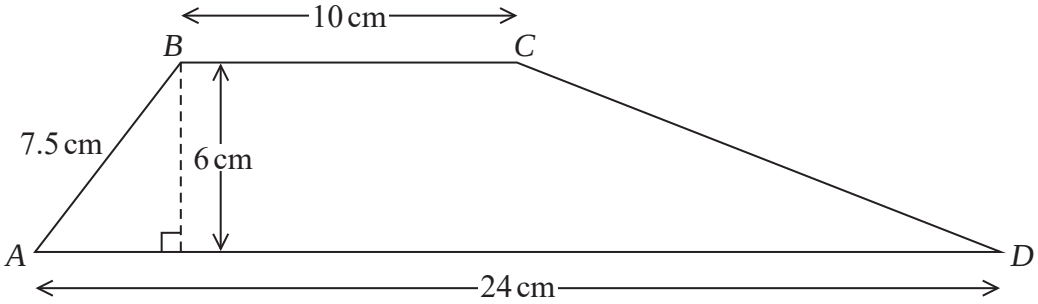
(b) Write down the mathematical name of quadrilateral **Q**.

.....

(1)

(Total for Question 10 is 3 marks)

22 *ABCD* is a trapezium.

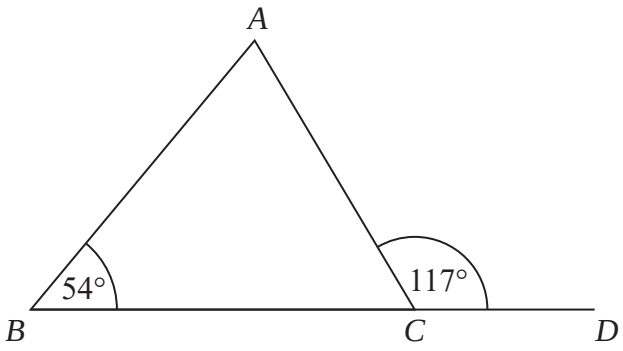


Work out the size of angle *CDA*.
Give your answer correct to 1 decimal place.

.....°

(Total for Question 22 is 5 marks)

7

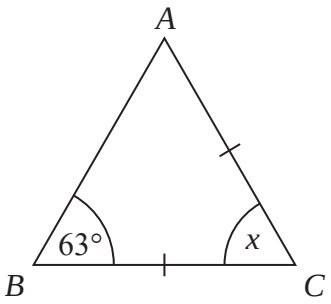


BCD is a straight line.
ABC is a triangle.

Show that triangle *ABC* is an isosceles triangle.
Give a reason for each stage of your working.

(Total for Question 7 is 4 marks)

15 Mary needs to work out the size of angle x in this diagram.



She writes

$x = 63°$ because base angles of an isosceles triangle are equal.

Mary is wrong.

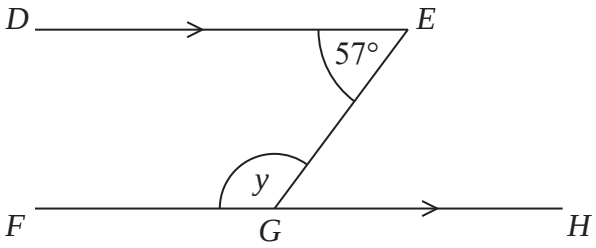
(a) Explain why.

.....

.....

(1)

William needs to work out the size of angle y in this diagram.



William writes

Working	**Reason**
angle $EGH = 57°$	because corresponding angles are equal
$y = 180° - 57°$ $y = 123°$	because angles on a straight line add up to 180°

One of William's reasons is wrong.

(b) Write down the correct reason.

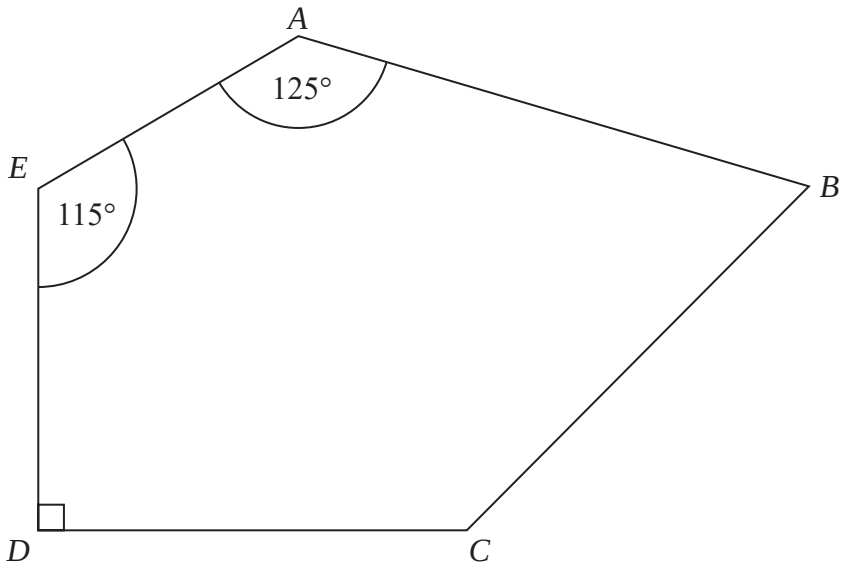
.....

.....

(1)

(Total for Question 15 is 2 marks)

26 *ABCDE* is a pentagon.



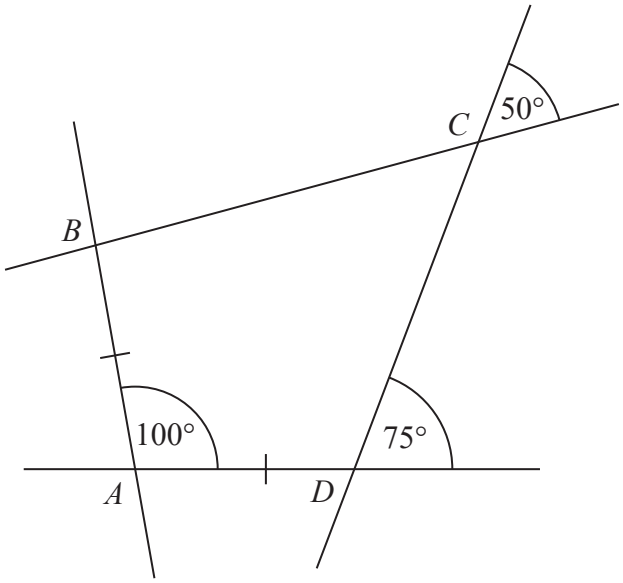
Angle *BCD* = 2 × angle *ABC*

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

.....°

(Total for Question 26 is 5 marks)

14 The diagram shows quadrilateral $ABCD$ with each of its sides extended.



$AB = AD$

Show that $ABCD$ is a kite.
Give a reason for each stage of your working.

(Total for Question 14 is 4 marks)

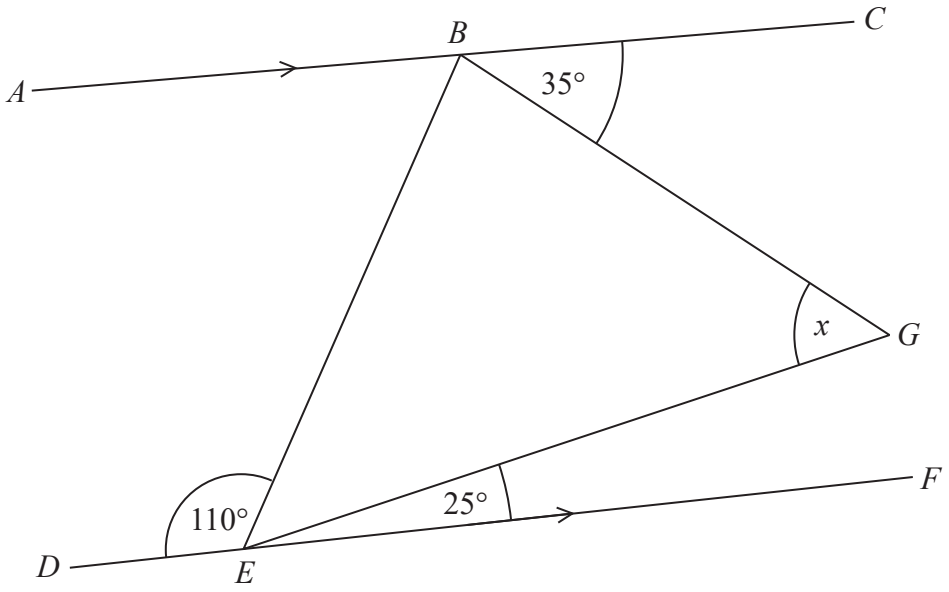
28 The size of each interior angle of a regular polygon is 11 times the size of each exterior angle.

Work out how many sides the polygon has.

.....

(Total for Question 28 is 3 marks)

22 *BEG* is a triangle.



ABC and *DEF* are parallel lines.

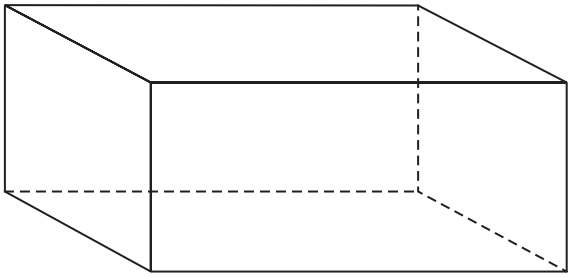
Work out the size of angle *x*.
Give a reason for each stage of your working.

.....°

.....

(Total for Question 22 is 4 marks)

5 Here is a 3-D shape.



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

.....

(1)

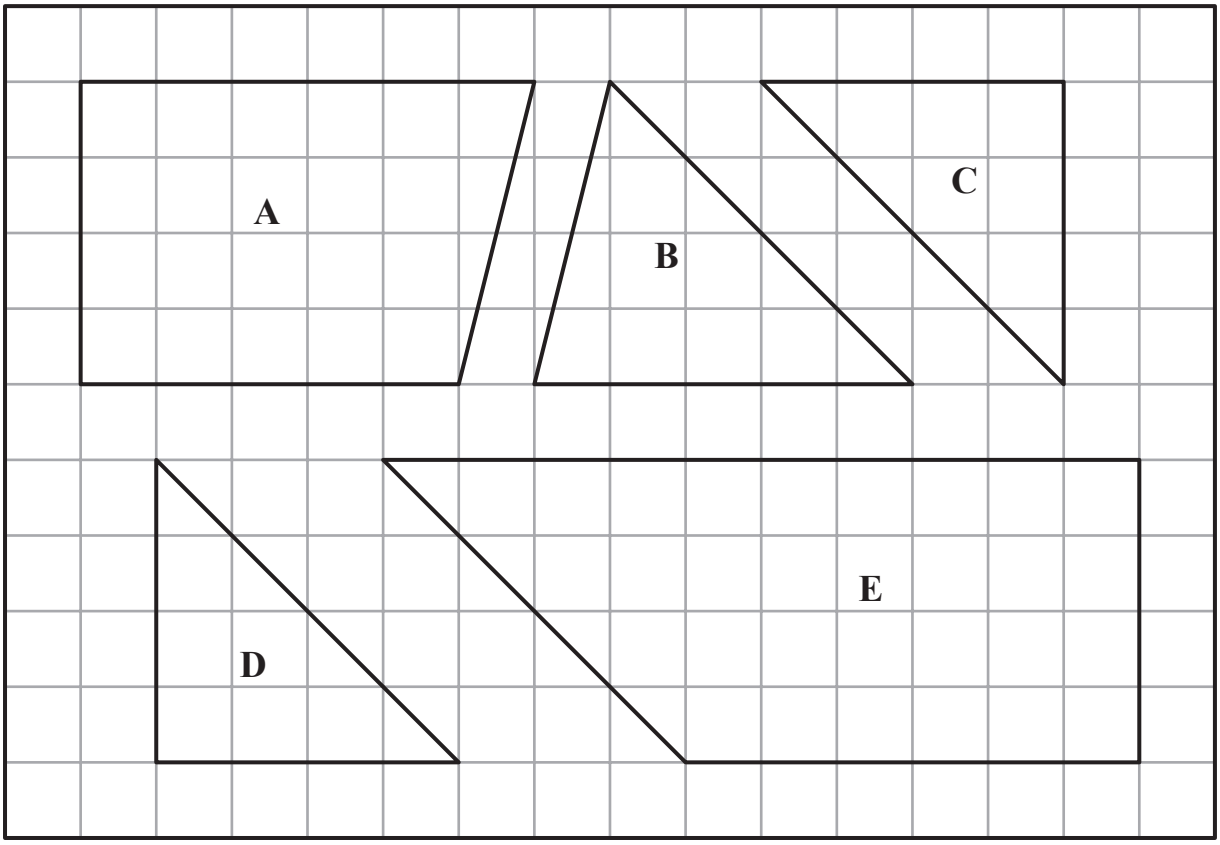
(b) Write down the number of edges of this 3-D shape.

.....

(1)

(Total for Question 5 is 2 marks)

9 The diagram shows five shapes on a centimetre grid.



(a) Write down the name of shape **E**.

.....

(1)

Two of the shapes are congruent.

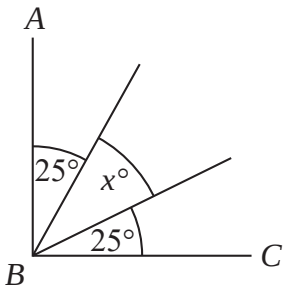
(b) Write down the letters of these two shapes.

..... and .....

(1)

(Total for Question 9 is 2 marks)

12 AB and BC are perpendicular lines.

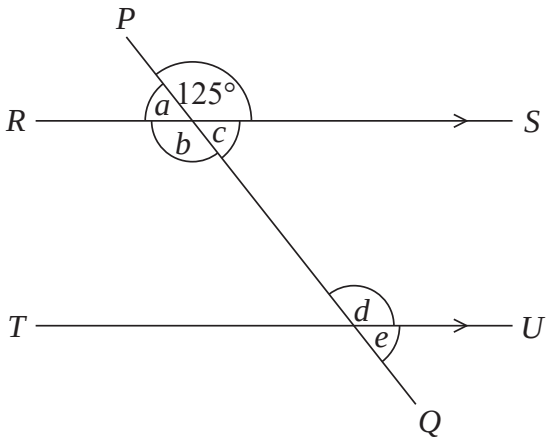


(a) Find the value of x.

$x =$ .....

(2)

RS and TU are parallel lines.
PQ is a straight line.



An angle of size 125° is shown on the diagram.

(b) (i) Write down the letter of one other angle of size 125°
Give a reason for your answer.

.....

.....

(2)

(ii) Explain why $a + b + c = 235°$

.....

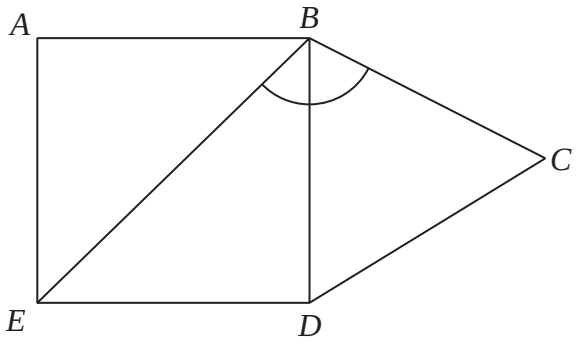
.....

.....

(1)

(Total for Question 12 is 5 marks)

20 The diagram shows a square *ABDE* and an equilateral triangle *BCD*.

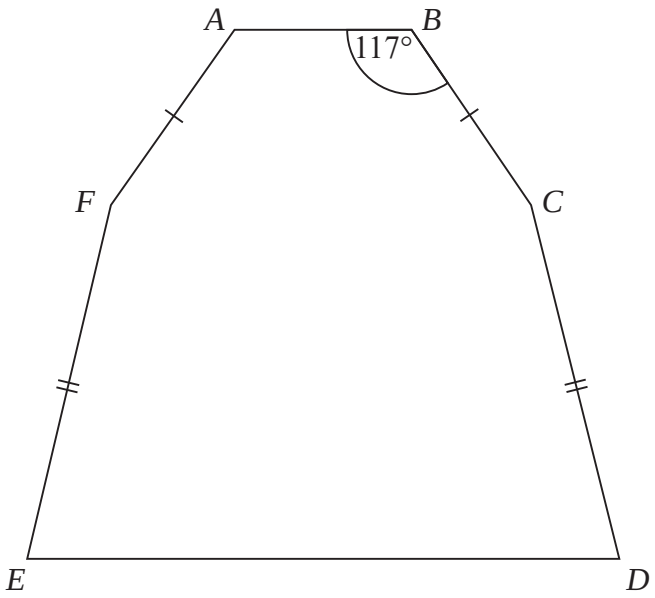


Work out the size of angle *EBC*.

.....°

(Total for Question 20 is 2 marks)

28 The diagram shows a hexagon.
The hexagon has one line of symmetry.



$FA = BC$
$EF = CD$
Angle $ABC = 117°$

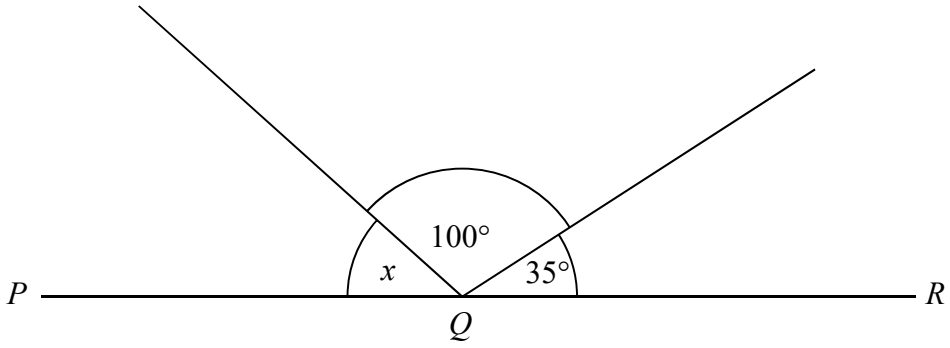
Angle $BCD = 2 \times$ angle CDE

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

.....°

(Total for Question 28 is 4 marks)

9 PQR is a straight line.

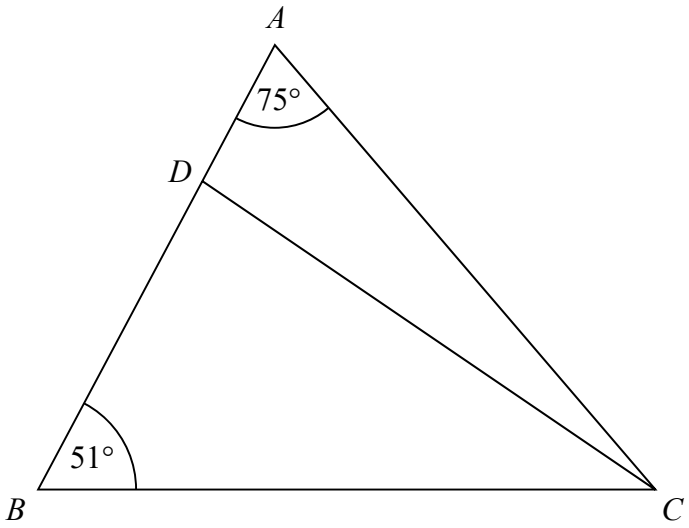


Work out the size of angle x.

.....°

(Total for Question 9 is 2 marks)

24 The diagram shows triangle ABC.



ADB is a straight line.

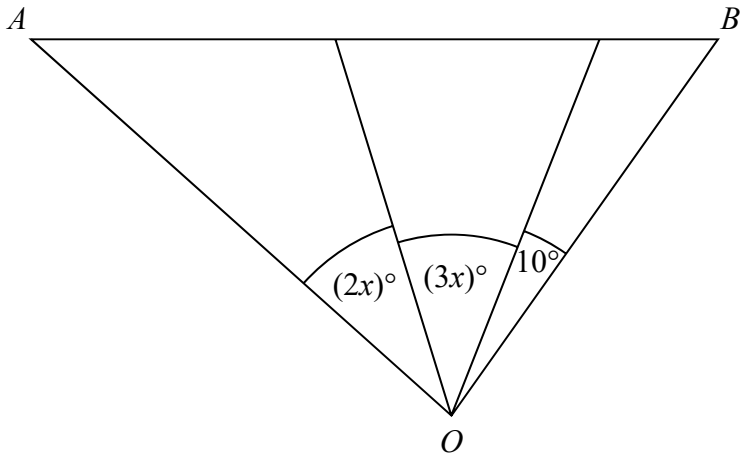
the size of angle DCB : the size of angle ACD = 2 : 1

Work out the size of angle BDC.

.....°

(Total for Question 24 is 4 marks)

28 The diagram shows triangle AOB.



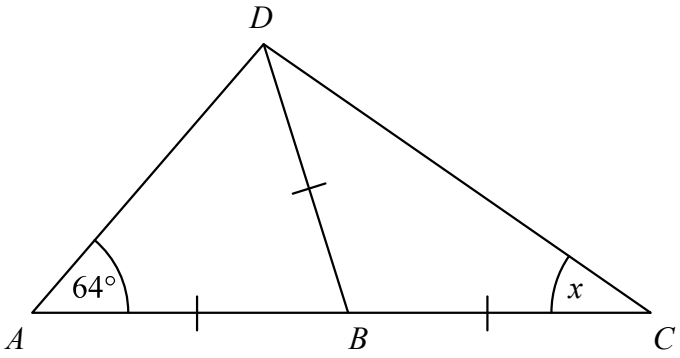
Angle AOB is **not** an obtuse angle.

Find the greatest value of x.
You must show all your working.

.....

(Total for Question 28 is 3 marks)

17

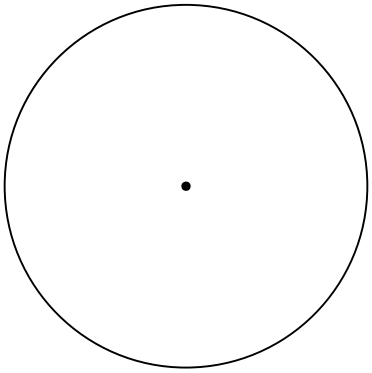


ABC is a straight line.
AB = *BC* = *BD*.
Angle *DAB* = 64°

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

(Total for Question 17 is 4 marks)

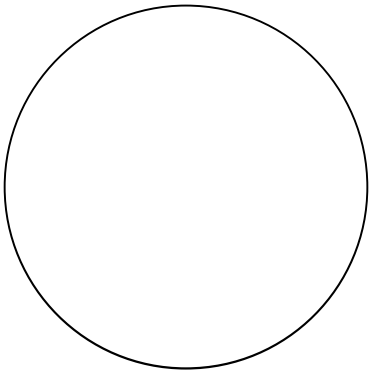
10



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

(1)

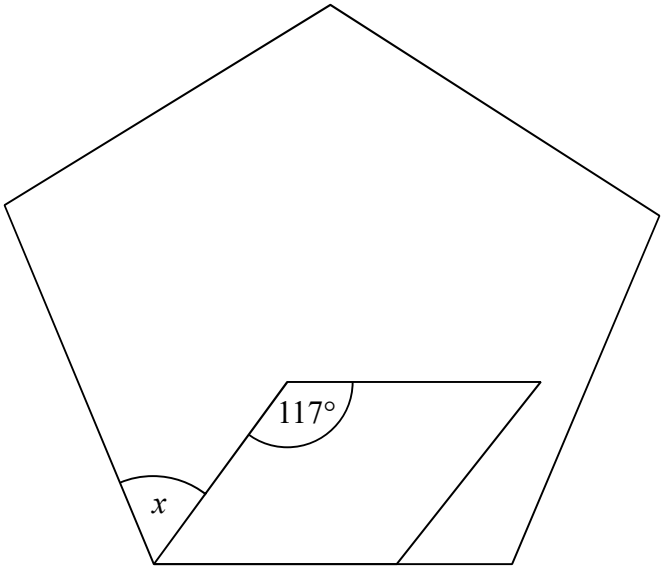
(b) On the diagram below, draw a segment of the circle.
Shade the segment.



(1)

(Total for Question 10 is 2 marks)

29 The diagram shows a regular pentagon and a parallelogram.

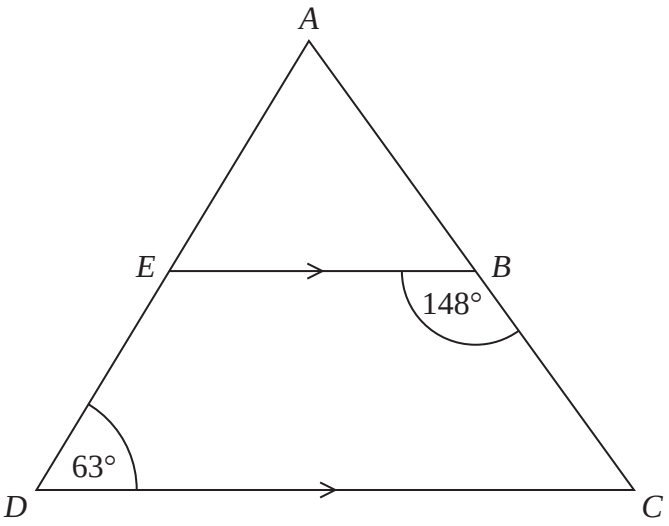


Work out the size of the angle marked x.
You must show all your working.

.....°

(Total for Question 29 is 4 marks)

25 *ADC* is a triangle.



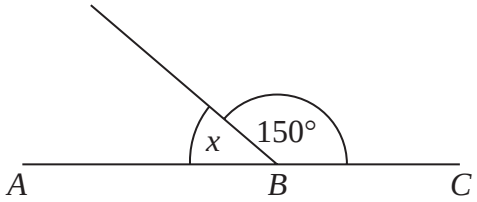
AED and *ABC* are straight lines.
EB is parallel to *DC*.

Angle *EBC* = 148°
Angle *ADC* = 63°

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

(Total for Question 25 is 5 marks)

8



ABC is a straight line.

(a) (i) Work out the size of the angle marked *x*.

.....°

(1)

(ii) Give a reason for your answer.

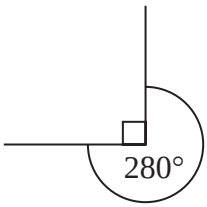
.....

.....

.....

(1)

The diagram below is wrong.



(b) Explain why.

.....

.....

.....

(1)

(Total for Question 8 is 3 marks)

Question 149

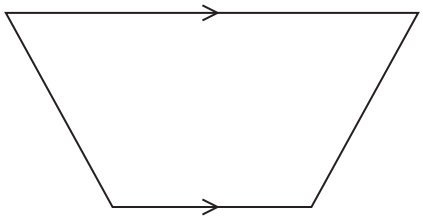
28 Each exterior angle of a regular polygon is 15°

Work out the number of sides of the polygon.

.....

(Total for Question 28 is 2 marks)

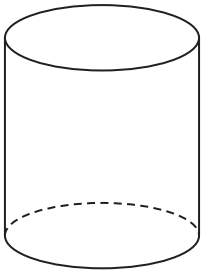
6 (a) Write down the mathematical name of this quadrilateral.



.....

(1)

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



.....

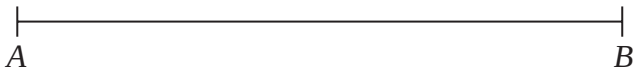
(1)

(Total for Question 6 is 2 marks)

Question 151

5 AB is a straight line.

Mark with a cross ($\times$) the midpoint of AB.



(Total for Question 5 is 1 mark)

15 Jenna measures all the angles around a point.

Her results are 23°, 145°, 23° and 69°

Explain why these results cannot be true.

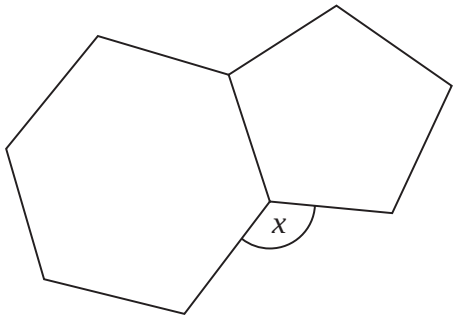
.....

.....

.....

(Total for Question 15 is 1 mark)

27 Here is a regular hexagon and a regular pentagon.

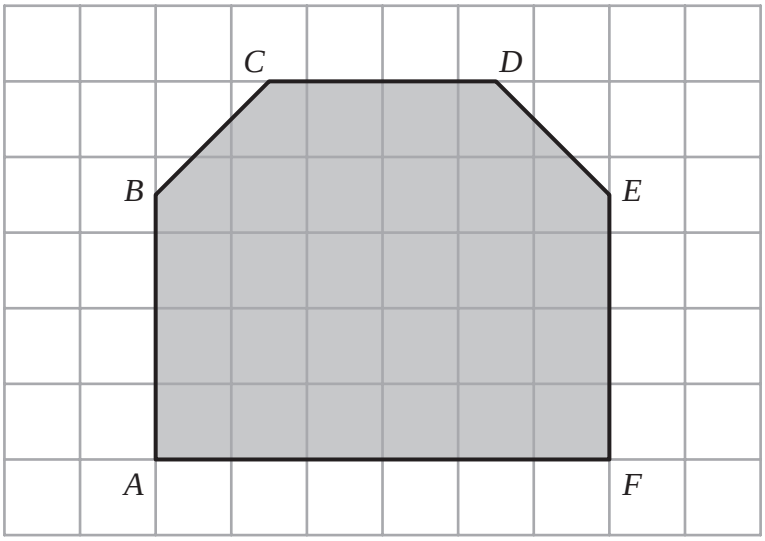


Work out the size of the angle marked x.
You must show all your working.

.....°

(Total for Question 27 is 3 marks)

7 Here is polygon *ABCDEF* on a square grid.



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

.....

(1)

(b) Which side of the polygon is parallel to the side *CD*?

.....

(1)

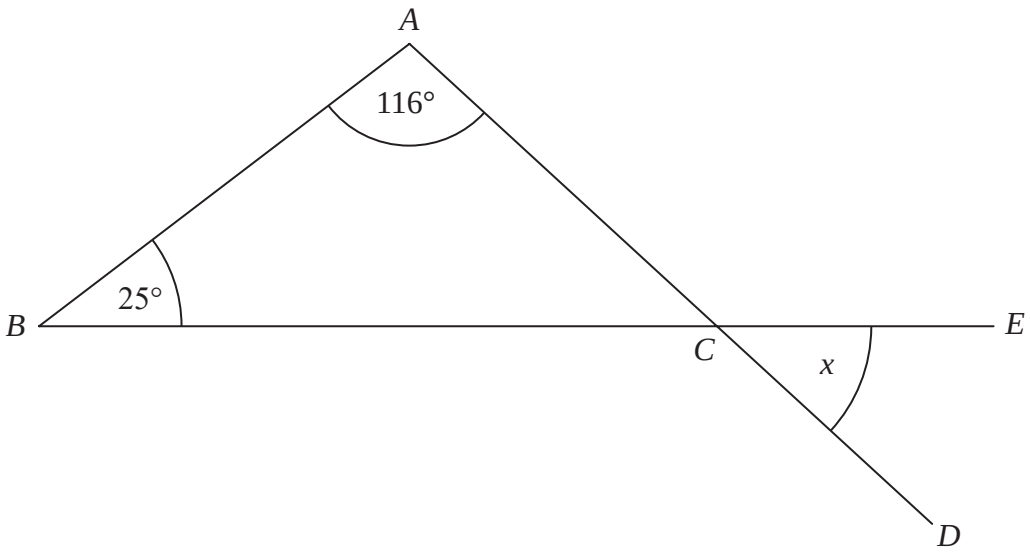
(c) Write down a side of the polygon that is perpendicular to the side *AF*.

.....

(1)

(Total for Question 7 is 3 marks)

11 The diagram shows a triangle *ABC*.



ACD and *BCE* are straight lines.

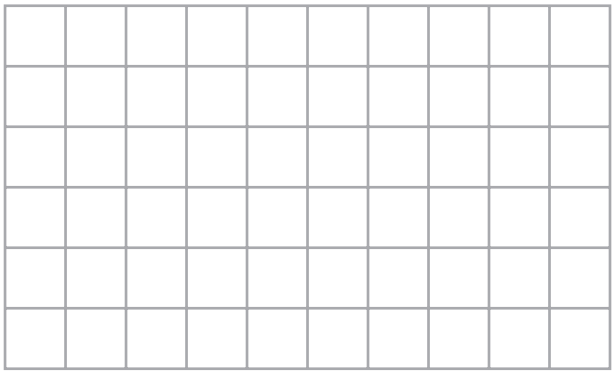
Work out the size of the angle marked *x*.
Give a reason for each stage of your working.

.....°

(Total for Question 11 is 3 marks)

Question 156

6

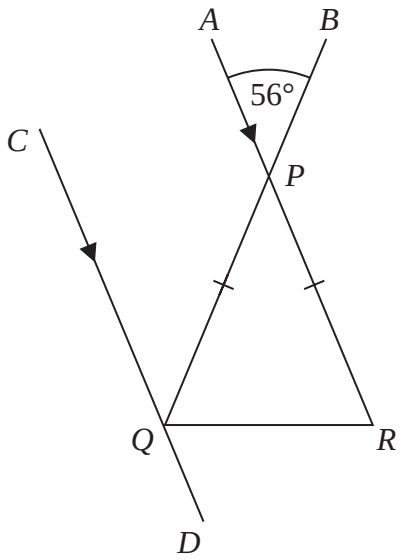


On the grid, draw a quadrilateral with

no lines of symmetry
and rotational symmetry of order 2

(Total for Question 6 is 2 marks)

20 In the diagram, PQR is an isosceles triangle with $PQ = PR$.



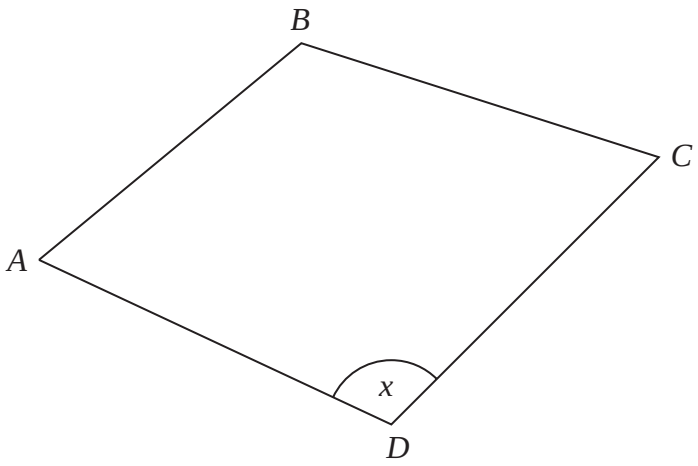
APR and CQD are parallel lines.
BPQ is a straight line.

Angle $APB = 56°$

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

(Total for Question 20 is 5 marks)

6 Here is a quadrilateral *ABCD*.



(a) Measure the length of the side *AB*.
Give your answer in centimetres.

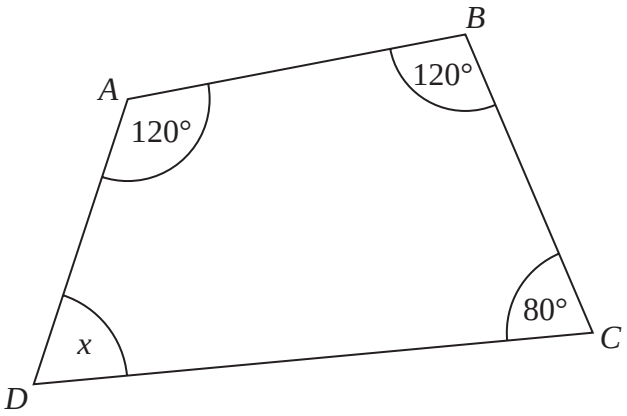
..... centimetres
(1)

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

°
.....
(1)

(Total for Question 6 is 2 marks)

13 *ABCD* is a quadrilateral.



(a) (i) Work out the size of angle *x*.

.....°

(1)

(ii) Give a reason for your answer.

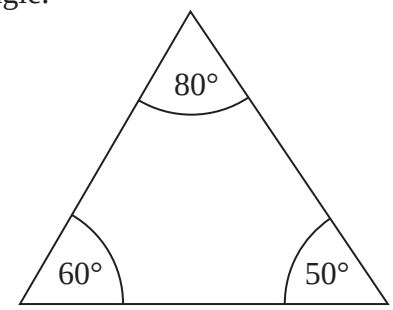
.....

.....

.....

(1)

The diagram below shows a triangle.



The diagram is wrong.

(b) Explain why.

.....

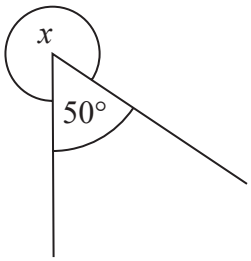
.....

.....

(1)

(Total for Question 13 is 3 marks)

8



(a) Work out the size of the angle marked x.

.....°

(2)

A student says that an angle of 50° is an obtuse angle.

The student is wrong.

(b) Explain why.

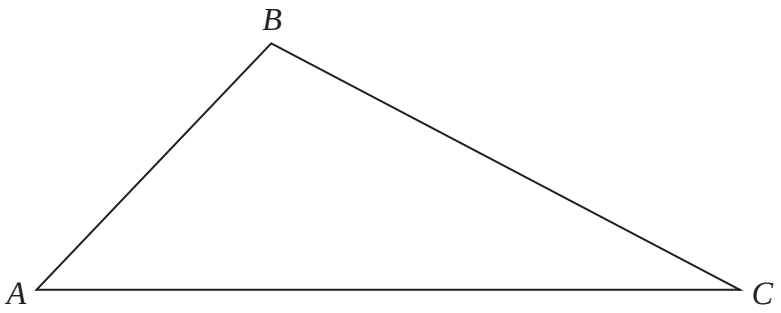
.....

.....

(1)

(Total for Question 8 is 3 marks)

7 Here is a triangle.
The triangle is accurately drawn.



(a) Measure the length of AC.

..... cm

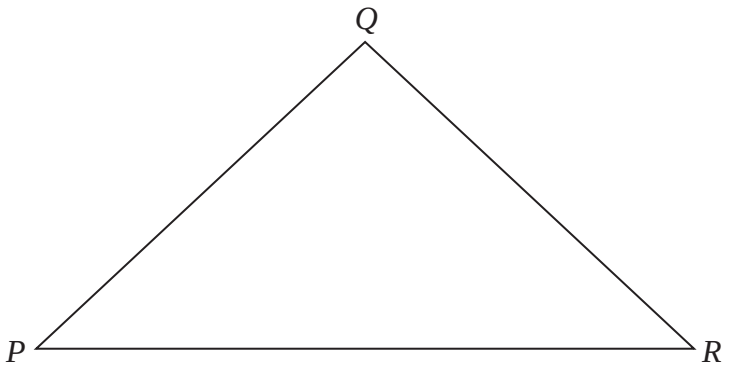
(1)

(b) Measure the size of angle B.

..... °

(1)

Here is a different triangle.



$QP = QR$

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

.....

(1)

(Total for Question 7 is 3 marks)

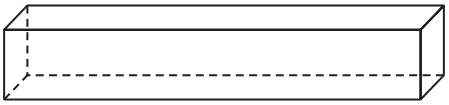
8 A quadrilateral has 4 right angles and 4 sides of equal length.

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

.....

(1)

The diagram shows a solid shape.



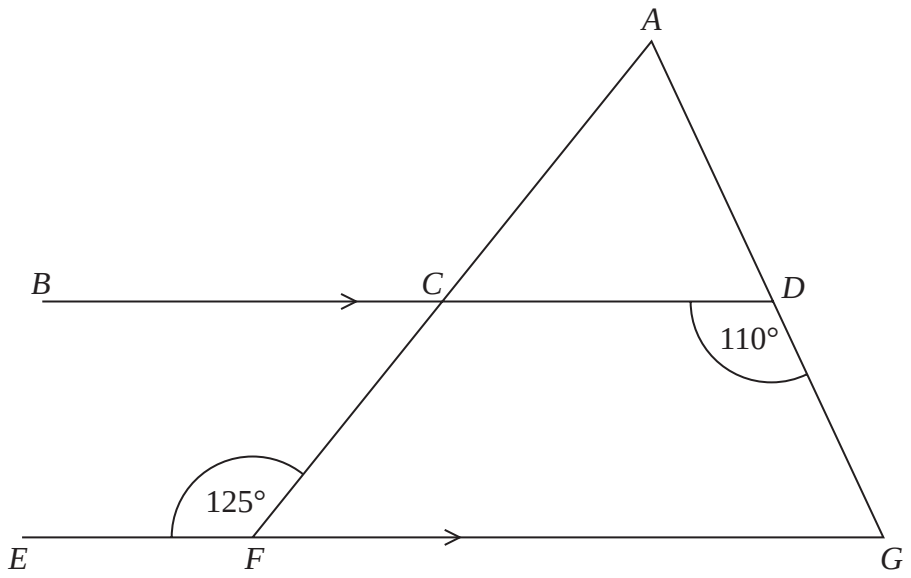
(b) Write down the mathematical name of this shape.

.....

(1)

(Total for Question 8 is 2 marks)

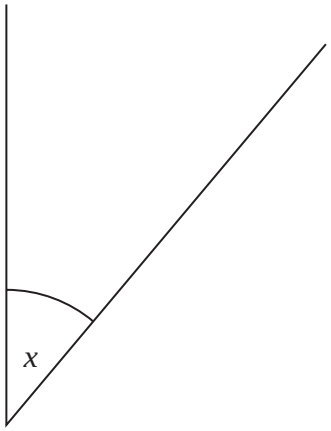
22 *ACF* and *ADG* are straight lines.
BCD and *EFG* are parallel lines.



Show that triangle *ACD* is isosceles.
Give a reason for each stage of your working.

(Total for Question 22 is 5 marks)

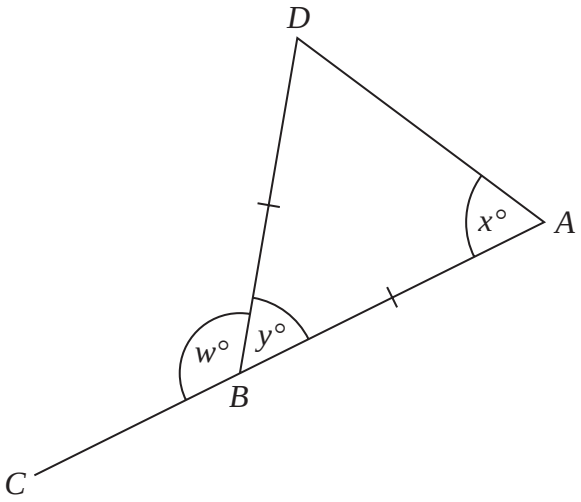
4 Measure the size of the angle marked x.



.....°

(Total for Question 4 is 1 mark)

23 The diagram shows an isosceles triangle *ABD* and the straight line *ABC*.



$BA = BD$

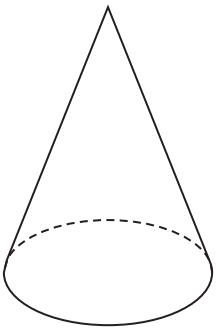
$x : y = 2 : 1$

Work out the value of w.

$w =$ .....

(Total for Question 23 is 4 marks)

7 Here is a 3-D shape.



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

.....

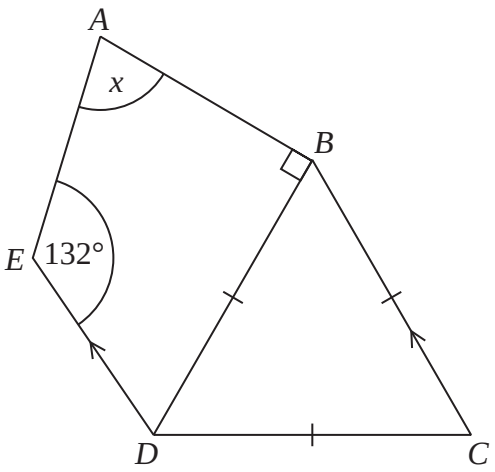
(1)

(b) In the space below, draw a sketch of a triangular prism.

(1)

(Total for Question 7 is 2 marks)

19 The diagram shows a quadrilateral *ABDE* and an equilateral triangle *BCD*.



CB is parallel to *DE*.

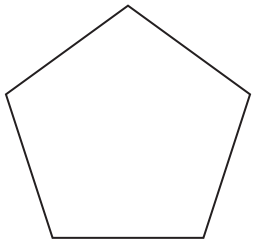
Angle *AED* = 132°

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

.....°

(Total for Question 19 is 4 marks)

10 Here is a polygon.

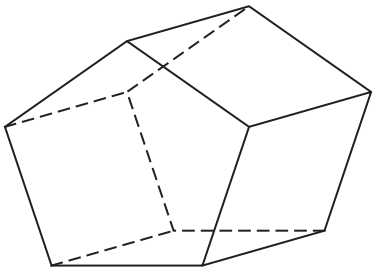


(a) Write down the mathematical name of this polygon.

.....

(1)

Here is a prism.



Each edge of the prism has a length of 7.5 cm.

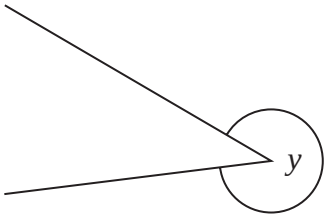
(b) Work out the total length of the edges of the prism.

..... cm

(2)

(Total for Question 10 is 3 marks)

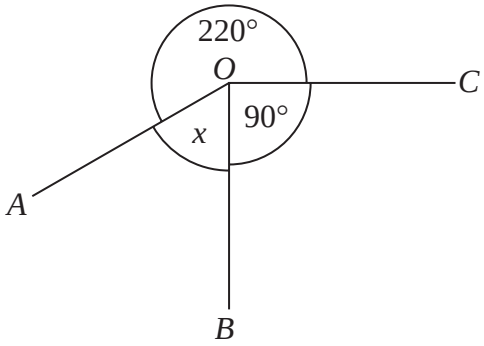
3 Write down the mathematical name for the type of angle marked y.



.....

(Total for Question 3 is 1 mark)

8 *OA*, *OB* and *OC* are three straight lines.



(i) Work out the size of the angle marked *x*.

..... °

(2)

(ii) Give a reason for your answer.

.....

.....

.....

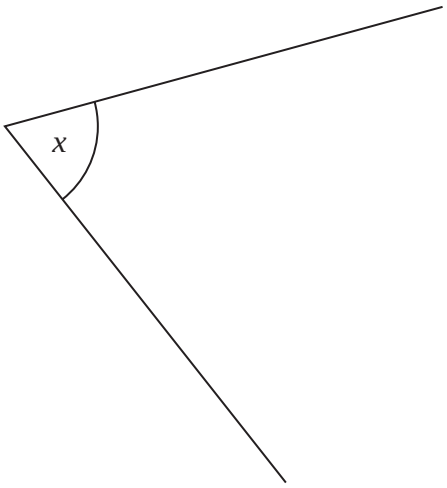
(1)

(Total for Question 8 is 3 marks)

7 (a) Measure the length of this line.
Give your answer in centimetres.

..... centimetres
(1)

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



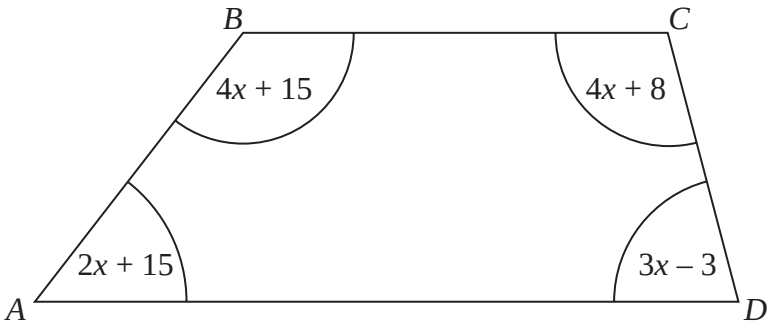
..... °
(1)

(c) In the space below, draw a hexagon.

(1)

(Total for Question 7 is 3 marks)

26 *ABCD* is a quadrilateral.

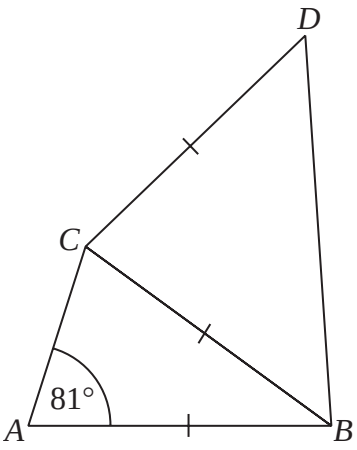


All angles are measured in degrees.

Show that *ABCD* is a trapezium.

(Total for Question 26 is 4 marks)

20 *ABC* and *BCD* are isosceles triangles.



AB = *BC* = *CD*
Angle *CAB* = 81°

Angle *BCD* = 4 × angle *ABC*

Find

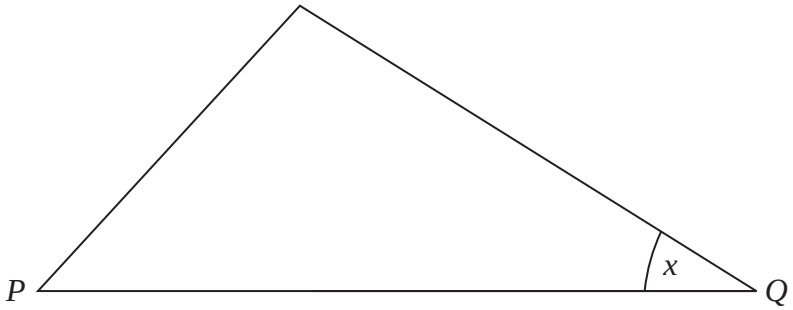
the size of angle *ABC* : the size of angle *CBD*

Give your answer in the form 1 : *n*
You must show all your working.

.....

(Total for Question 20 is 5 marks)

7 Here is an accurately drawn triangle.



(a) Measure the length of the side PQ.
Give your answer in centimetres.

..... centimetres
(1)

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

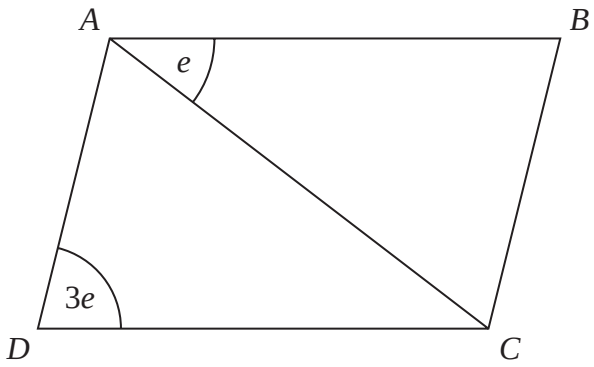
.....
(1)

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

°
.....
(1)

(Total for Question 7 is 3 marks)

21 *ABCD* is a parallelogram.



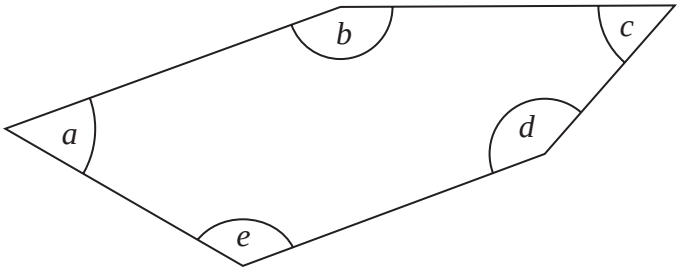
All angles are measured in degrees.

Find an expression, in terms of *e*, for the size of angle *CAD*.
Give a reason for each stage of your working.

.....

(Total for Question 21 is 3 marks)

23 Here is a pentagon.



Angle a = angle c
Angle b = 155°
Angle d is three times the size of angle c
Angle e is two times the size of angle c

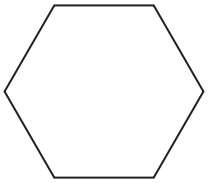
Work out the size of angle a

.....°

(Total for Question 23 is 4 marks)

Question 177

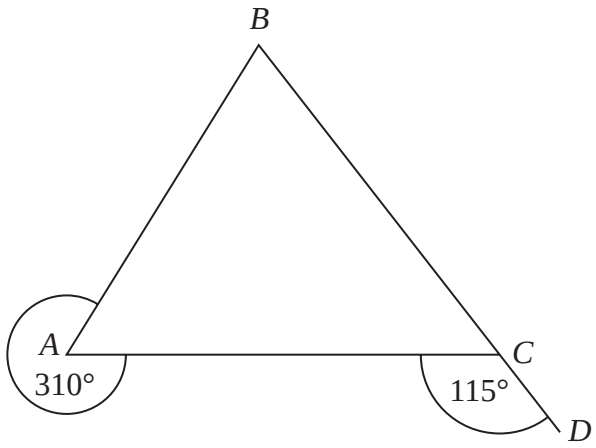
4 Write down the mathematical name of this polygon.



.....

(Total for Question 4 is 1 mark)

13 *ABC* is a triangle.



BCD is a straight line.

Show that triangle *ABC* is isosceles.
Give a reason for each stage of your working.

(Total for Question 13 is 4 marks)

Question 179

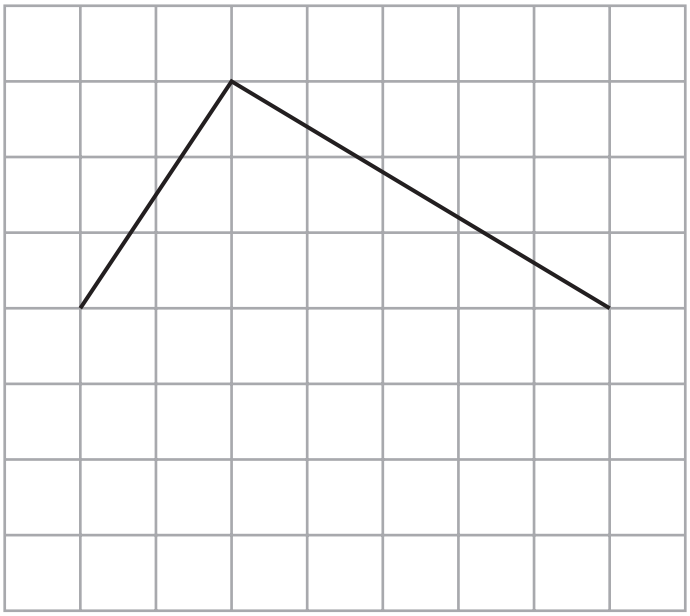
5 Angle A is 53°

What type of angle is angle A?

.....

(Total for Question 5 is 1 mark)

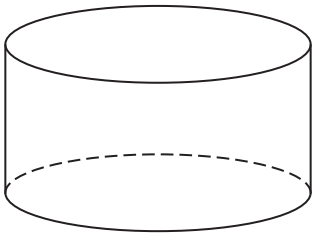
8 The diagram shows two sides of a kite.



(a) On the grid, complete the kite.

(1)

(b) What is the mathematical name of this solid shape?

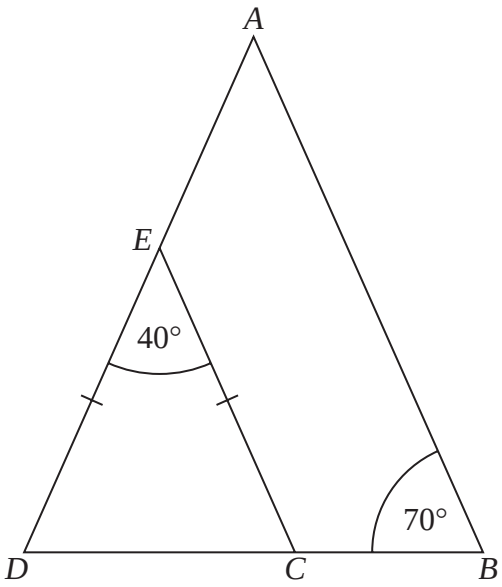


.....

(1)

(Total for Question 8 is 2 marks)

16

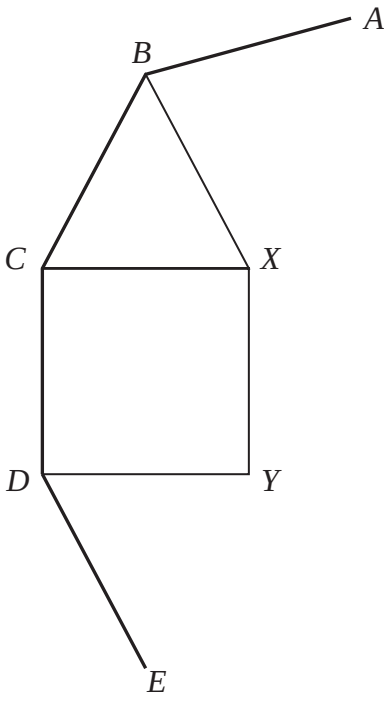


AED and *BCD* are straight lines.
ED = *EC*

Show that *EC* is parallel to *AB*.
Give a reason for each stage of your working.

(Total for Question 16 is 4 marks)

24 *AB*, *BC*, *CD* and *DE* are four sides of a regular polygon with *n* sides.



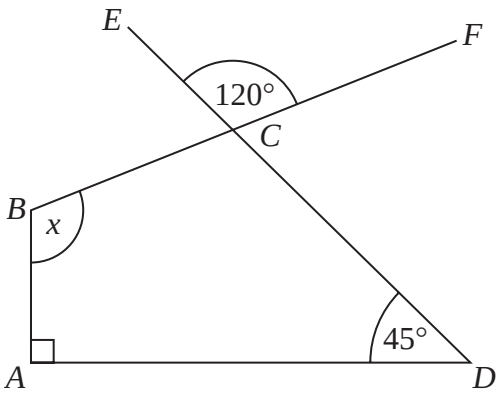
BCX is an equilateral triangle.
CDYX is a square.

Work out the value of *n*.
You must show all your working.

n = ...

(Total for Question 24 is 4 marks)

13 *ABCD* is a quadrilateral.
BCF and *DCE* are straight lines.



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

.....°

(Total for Question 13 is 4 marks)