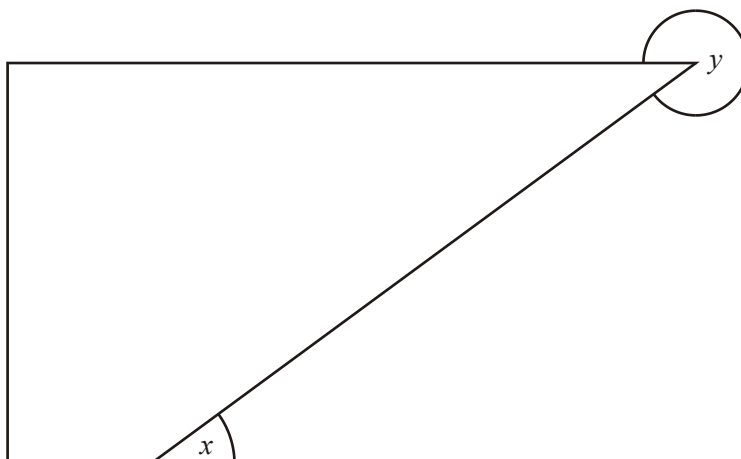


1. The lines in the diagram are straight.



- (a) Mark with arrows, (\gg), a pair of parallel lines.

(1)

- (b) Mark with the letter R, a right angle.

(1)

- (c) What type of angle is shown by the letter

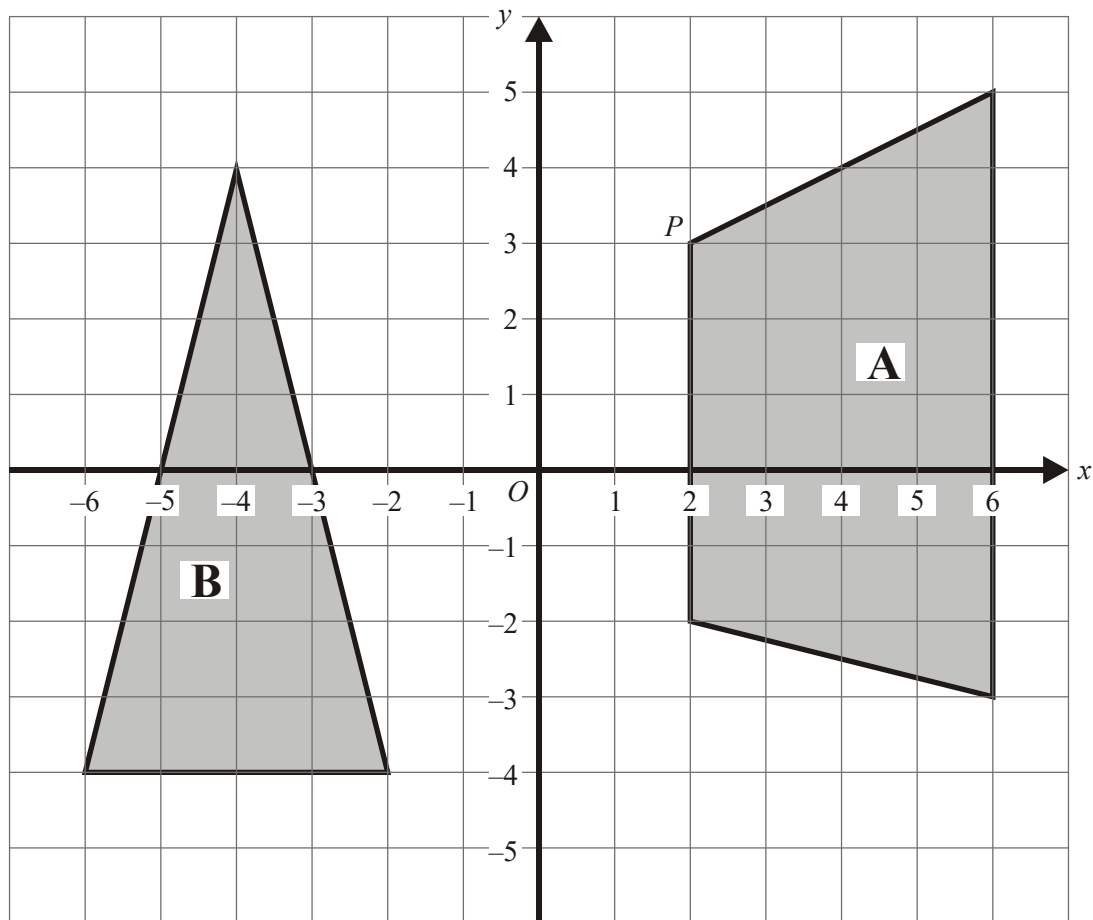
(i) x ,

(ii) y

(2)

(Total 4 marks)

2.



The diagram shows two shapes.

(a) Write down the mathematical name for the shape **A**.

..... (1)

(b) Write down the coordinates of the point *P*.

(.....,.....) (1)

(c) Write down the mathematical name of the triangle **B**.

..... (1)

The coordinates of another point are $(-2, -4)$.

- (d) Mark this point on the grid.
Label it Q .

(1)
(Total 4 marks)

3.

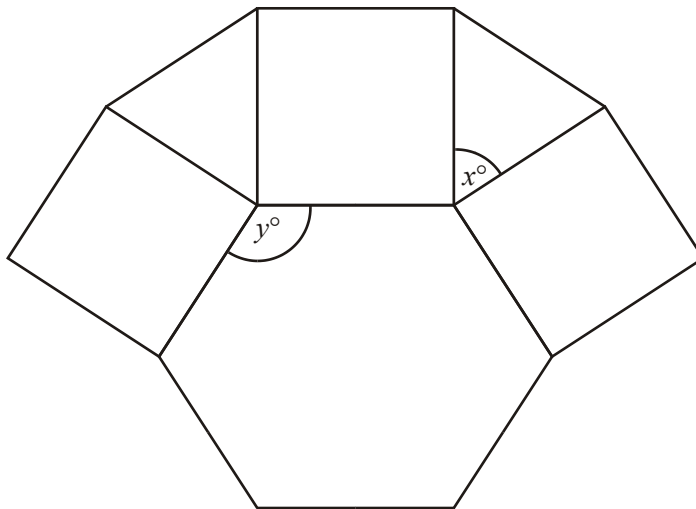


Diagram **NOT**
accurately drawn

This is part of the design of a pattern found at the theatre of Diana at Alexandria.

It is made up of a regular hexagon, squares and equilateral triangles.

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

.....^o

(1)

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

.....^o

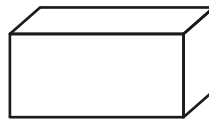
(2)

The area of each equilateral triangle is 2 cm^2 .

- (c) Work out the area of the regular hexagon.

..... cm^2
(2)
(Total 5 marks)

4. Neil buys a box of tiles.
The shape of the box is a cuboid.



- (a) How many vertices has a cuboid?

.....
(1)

Here is a tile in the shape of a polygon.

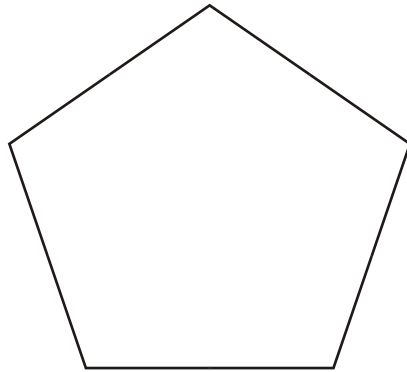


Diagram **NOT**
accurately drawn

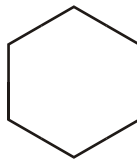
(b) Write down the mathematical name of this polygon.

.....

(1)

(Total 2 marks)

5.



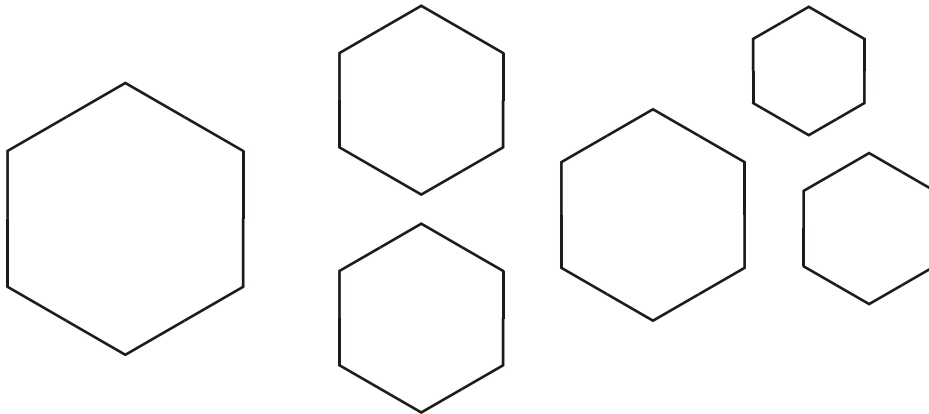
(a) What special name is given to this polygon?

.....

(1)

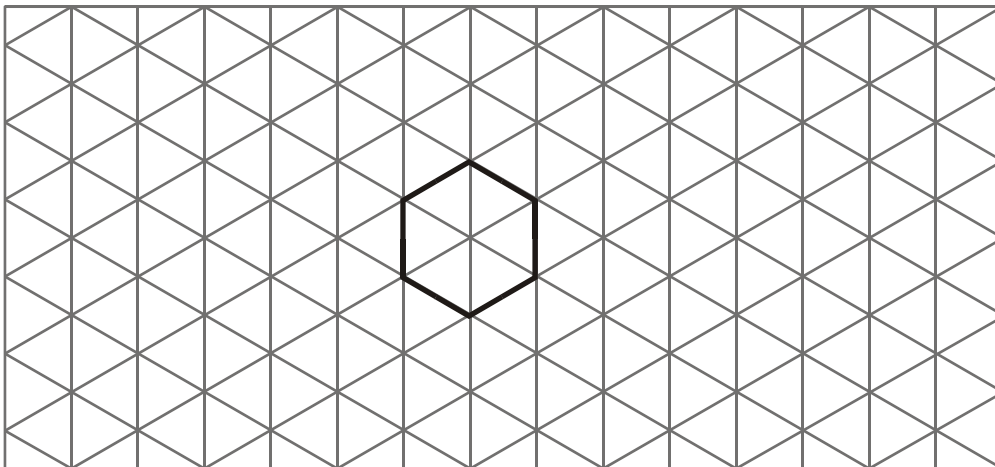
One of the polygons below is congruent to the polygon shown in part (a).

(b) Draw a circle around this polygon.



(1)

(c) On the grid, show how this shape will tessellate.
You should draw at least 8 shapes.

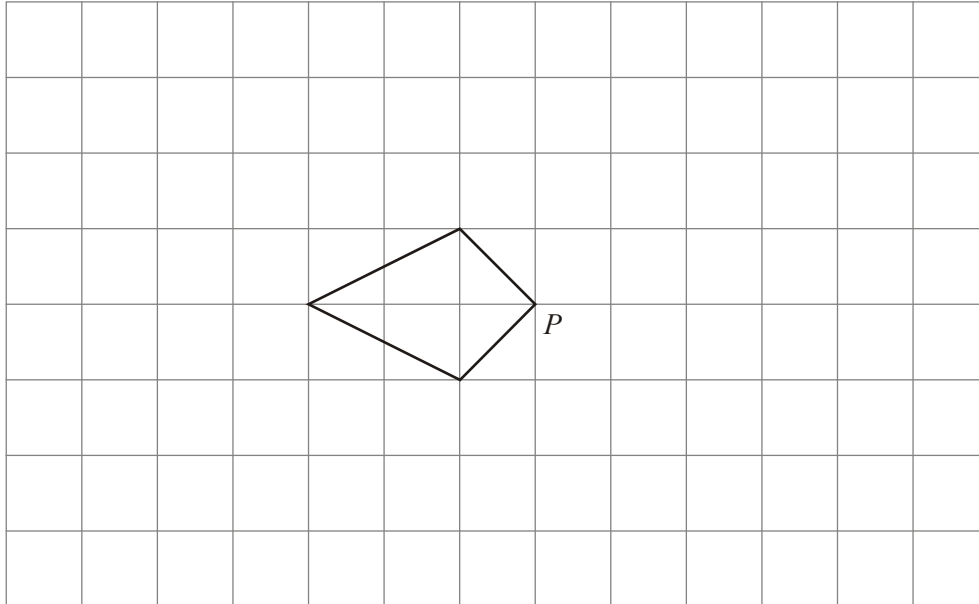


(2)

(Total 4 marks)

6. The diagram shows part of a shape.

The shape has rotational symmetry of order 4 about the point P .

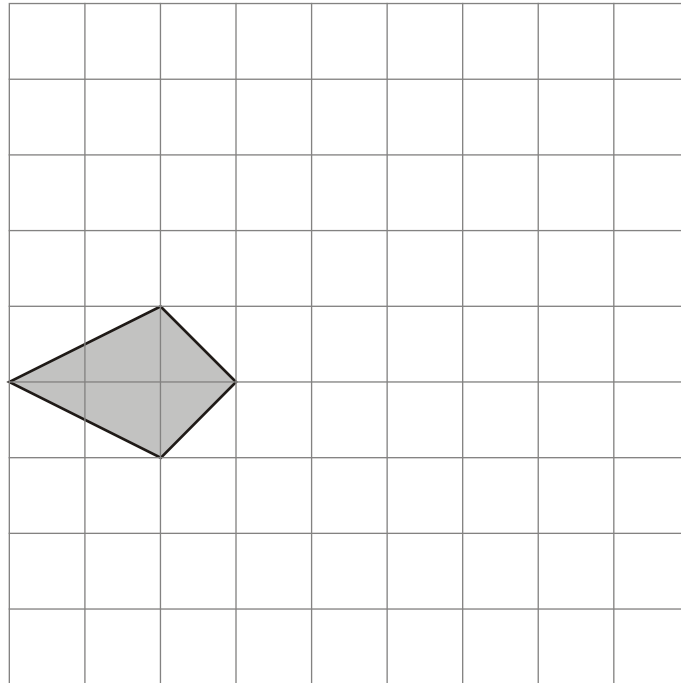


- (a) On the grid above, complete the shape.

(3)

(b) On the grid below, show how the shaded shape will tessellate.

You should draw at least six shapes.



(2)
(Total 5 marks)

7.

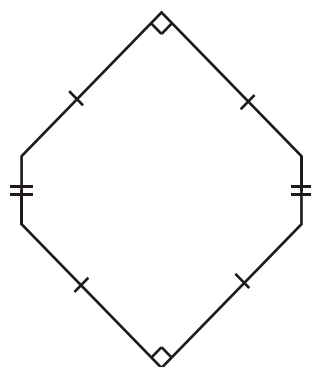


Diagram **NOT**
accurately drawn

The diagram shows a shape.

The shape is a 6-sided polygon.

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

.....

(1)

The diagram below shows how the shape tessellates.

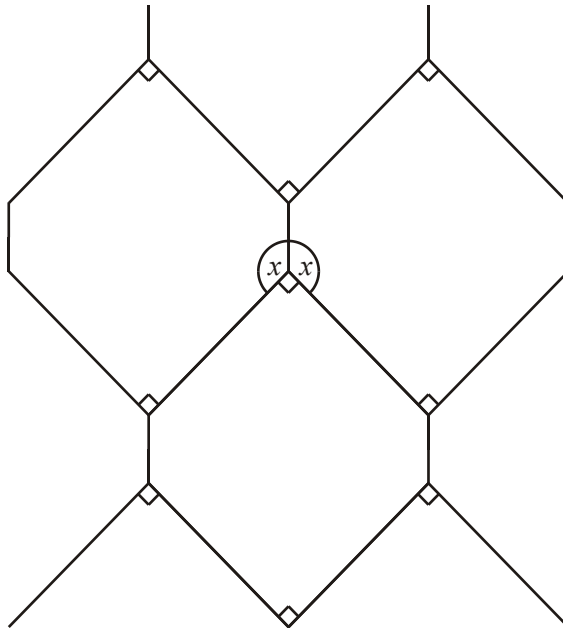


Diagram **NOT** accurately drawn

The size of each of the angles marked x is 135° .

- (b) Give reasons why.

.....

(2)

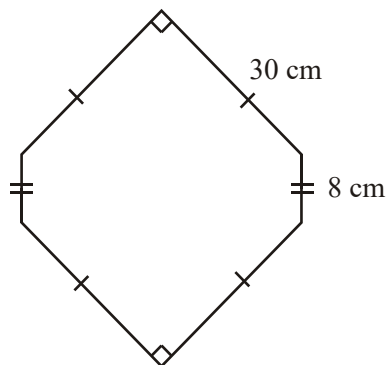


Diagram **NOT** accurately drawn

The diagram shows the lengths of two of the sides of the shape.

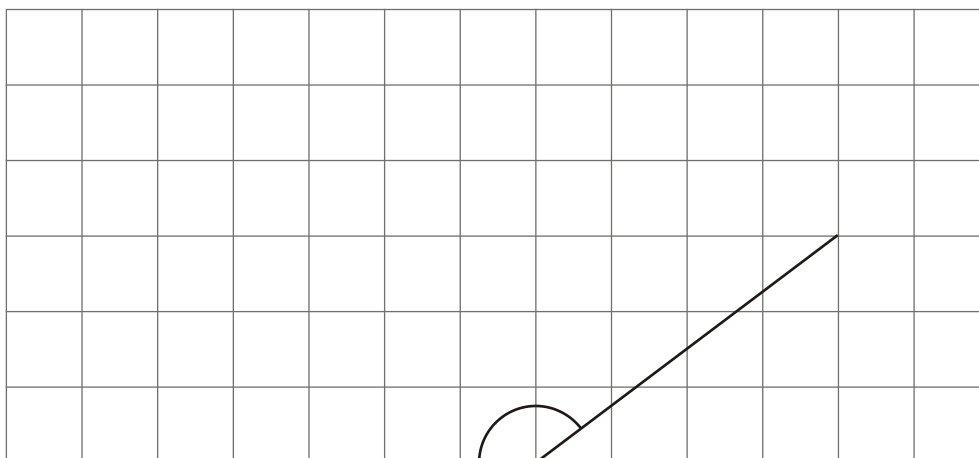
- (c) Work out the perimeter of the shape.

.....cm

(2)

(Total 5 marks)

8. The diagram shows two sides of a rhombus drawn on a grid of centimetre squares.



- (a) (i) Measure the size of the angle between these two sides.

.....°

- (ii) What type of angle have you measured?

.....

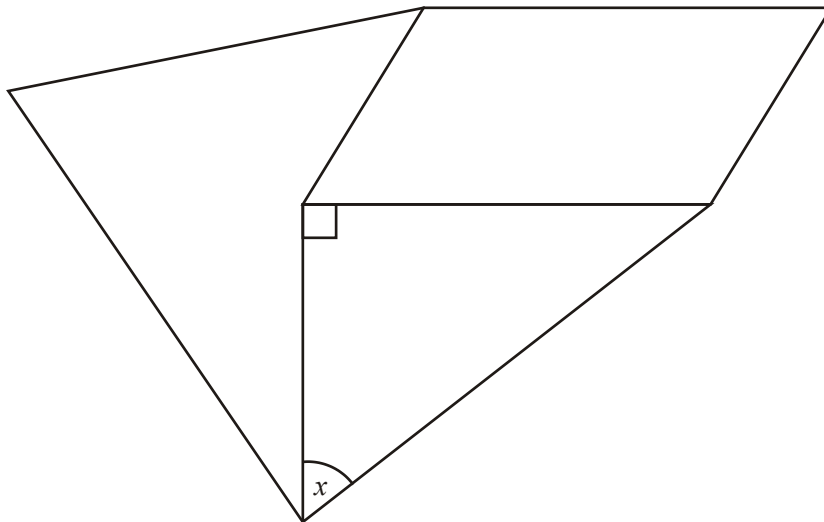
(2)

- (b) Complete accurately the drawing of the rhombus.

(1)

(Total 3 marks)

9. The shape is made from a right-angled triangle, a parallelogram and a quadrilateral.



- (a) Mark with arrows (») a pair of parallel lines.

(1)

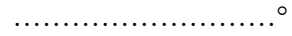
- (b) Mark with the letter *A* an acute angle.

(1)

- (c) Mark with the letter *R* a reflex angle.

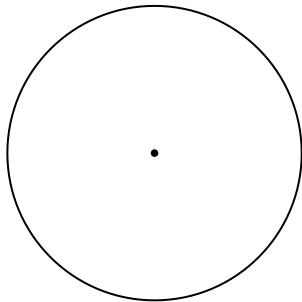
(1)

(d) Measure the size of angle x .



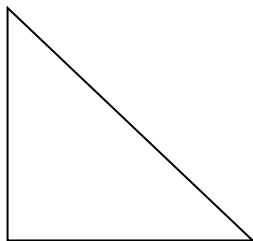
(1)
(Total 4 marks)

10. (a) In the circle, draw a diameter.



(1)

(b) In the triangle, mark the right angle with a letter R .



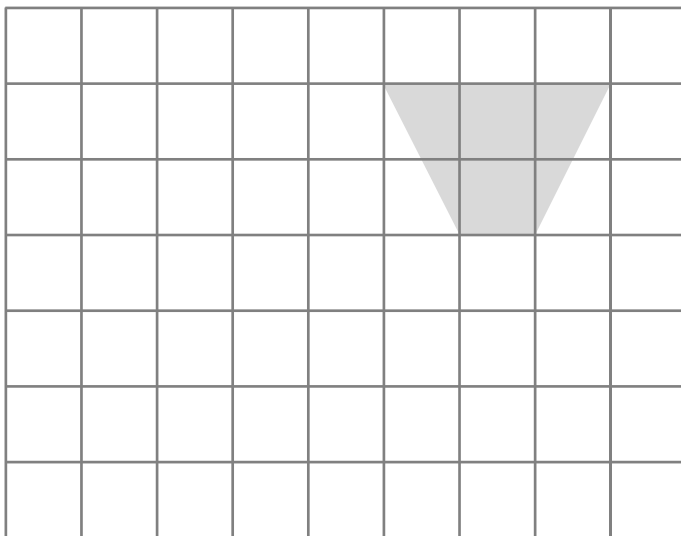
(1)

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

(1)
(Total 3 marks)

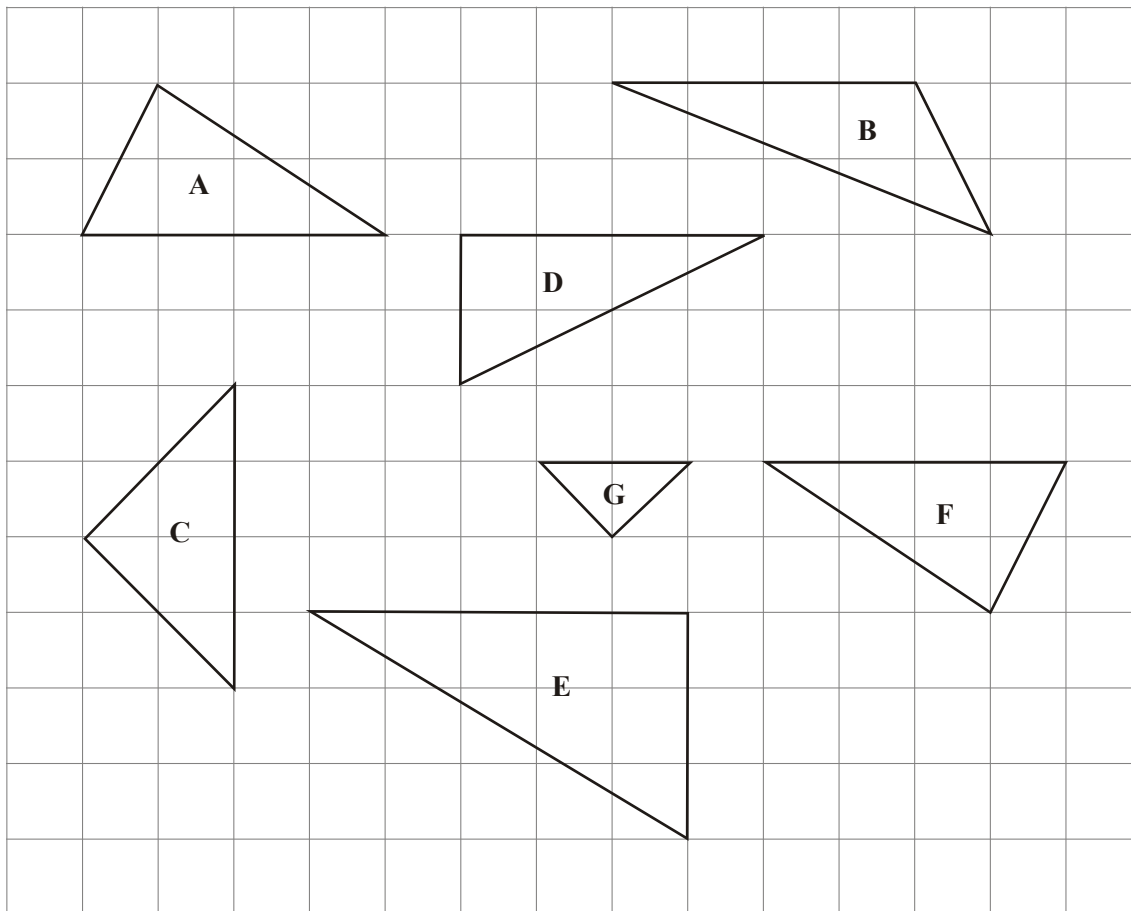
11. On the grid, show how this shape tessellates.

You should draw at least 6 shapes.



(Total 2 marks)

12.



(a) Write down the letter of an isosceles triangle.

.....

(1)

(b) Write down the letters of **two** triangles which are congruent.

..... and

(1)

Triangle **C** is an enlargement of triangle **G**.

(c) Write down the scale factor of this enlargement.

.....

(1)

(Total 3 marks)

13. The diagram shows a solid triangular prism.

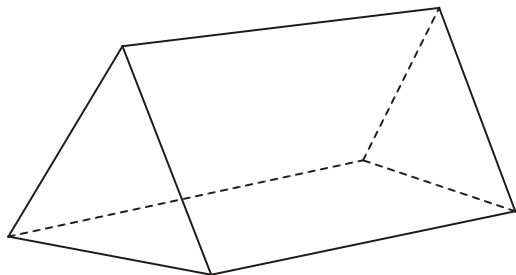


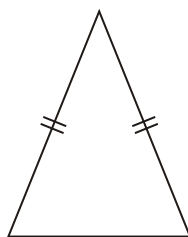
Diagram **NOT**
accurately drawn

Write down

- (i) the number of faces
- (ii) the number of edges
- (iii) the number of vertices

(Total 3 marks)

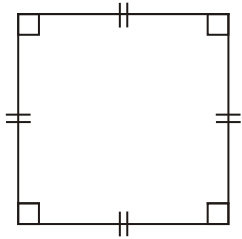
14. Here is a triangle.
What type of triangle is it?



.....

(1)

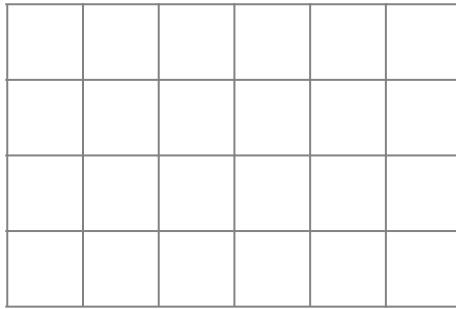
- (b) Here is a quadrilateral.
What type of quadrilateral is it?



.....

(1)

- (c) On the grid below, draw a trapezium.



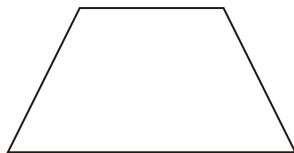
.....

(1)

(Total 3 marks)

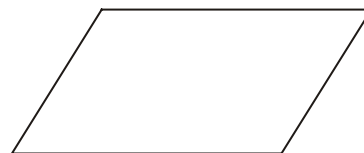
15. (a) Write down the mathematical name of each of these quadrilaterals.

(i)



(i)

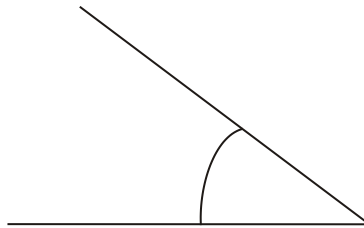
(ii)



(ii)

(2)

(b) What type of angle is this?



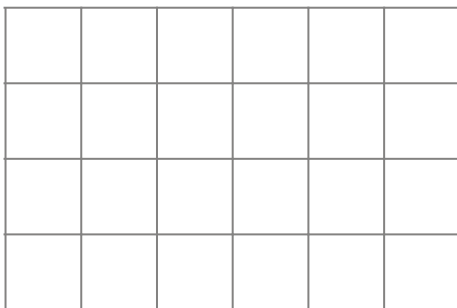
.....

(1)
(Total 3 marks)

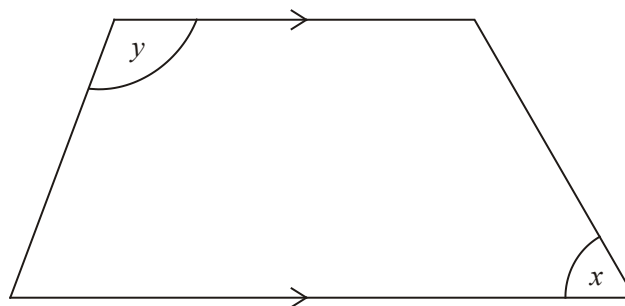
.....

(1)

(c) On the grid below, draw a trapezium.



16.



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

.....

(1)

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

.....^o (1)

(c) Write down the special name for the angle marked y .

..... (1)
(Total 3 marks)

17.

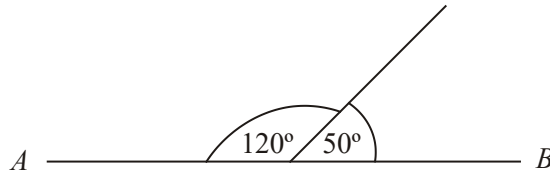


Diagram **NOT** accurately drawn

AB is a straight line.

(a) This diagram is wrong.
Explain why.

..... (1)

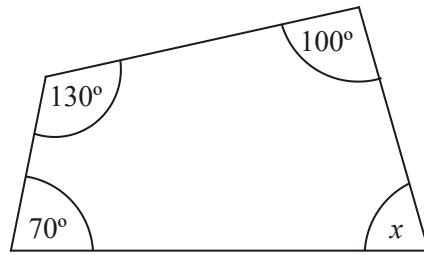
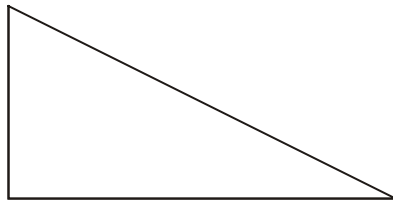


Diagram **NOT** accurately drawn

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

.....^o
 (2)
 (Total 3 marks)

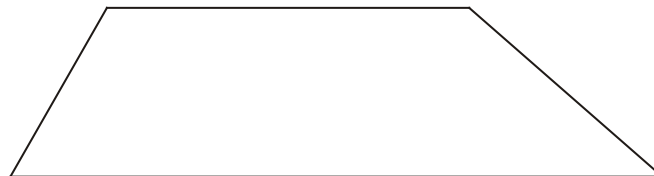
18. (a) Here is a right-angled triangle.



Mark the right angle with a letter R.

(1)

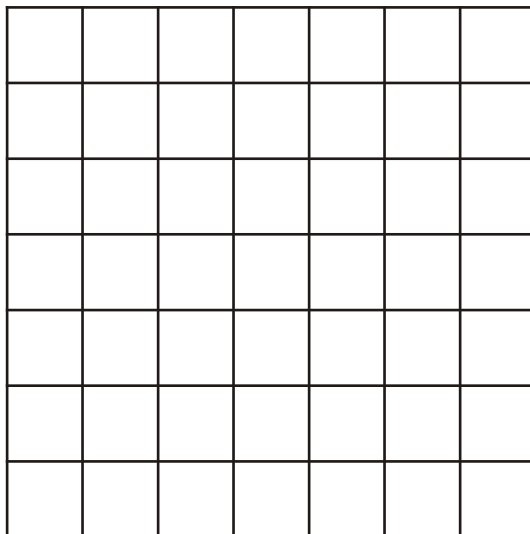
- (b) Here is a trapezium.



Mark an acute angle with a letter A.

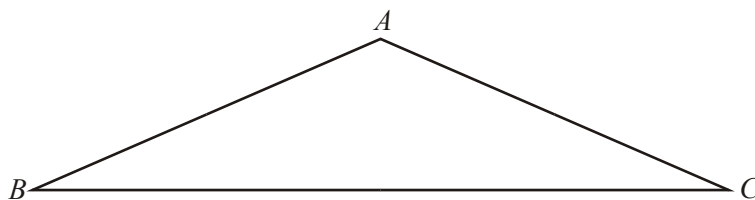
(1)

(c) On the grid, draw a kite.



(1)
(Total 3 marks)

19.



(a) Measure the length of BC .

..... cm

(1)

(b) (i) Measure the size of angle B in triangle ABC .

.....°

(ii) Write down the special name given to this type of angle.

.....

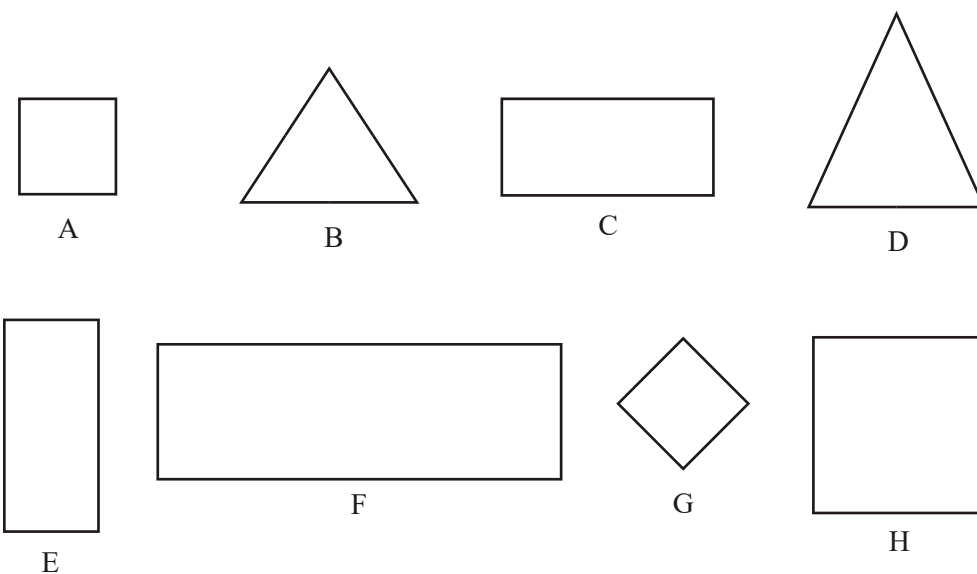
(2)

In the triangle ABC , $AB = AC$.

(c) Draw the line of symmetry of the triangle.

(1)
(Total 4 marks)

20. Here are 8 shapes.



Write down the letters of two **different** pairs of congruent shapes.

..... and

..... and

(Total 2 marks)

21. Write down the names of **two** quadrilaterals whose diagonals cross at right angles.

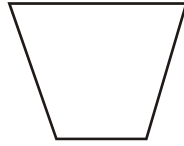
..... and

(Total 2 marks)

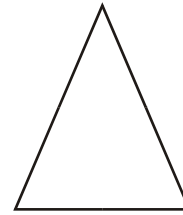
22. Here are 9 shapes.



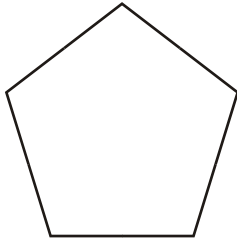
A



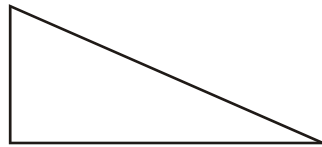
B



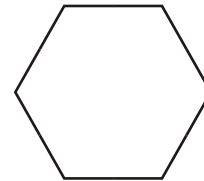
C



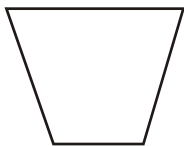
D



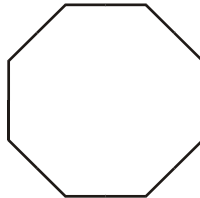
E



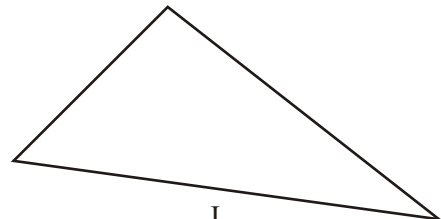
F



G



H



I

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

(i) a pentagon,

.....

(ii) an isosceles triangle.

.....

(2)

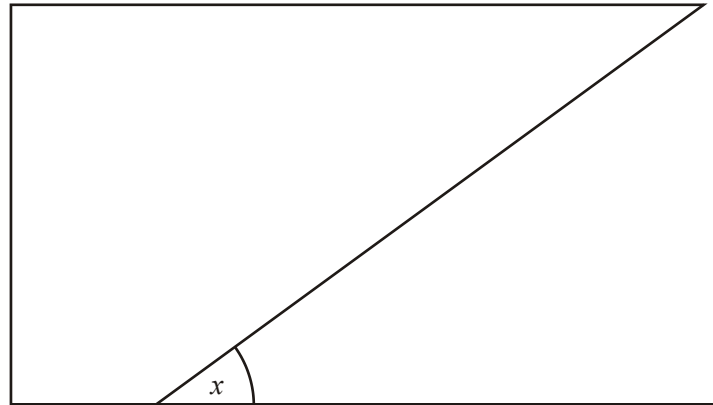
(b) Write down the letters of the pair of congruent shapes.

..... and

(1)

(Total 3 marks)

23. The lines in the diagram are straight.



(a) Mark with arrows, (\gg), a pair of parallel lines. (1)

(b) Mark with the letter R, a right angle. (1)

(c) What type of angle is shown by the letter x ?
 (1)
(Total 3 marks)

24. Here is a cuboid.

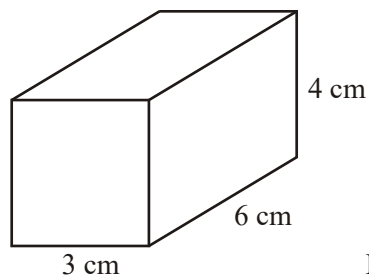


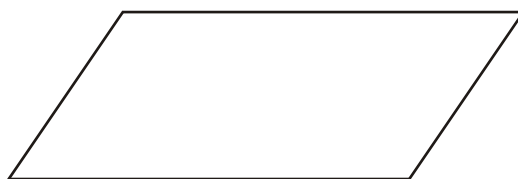
Diagram **NOT** accurately drawn

(a) Write down
 (i) the number of edges of this cuboid,
 (ii) the number of vertices of the cuboid (2)

(b) Draw an accurate net for the cuboid.

(3)
(Total 5 marks)

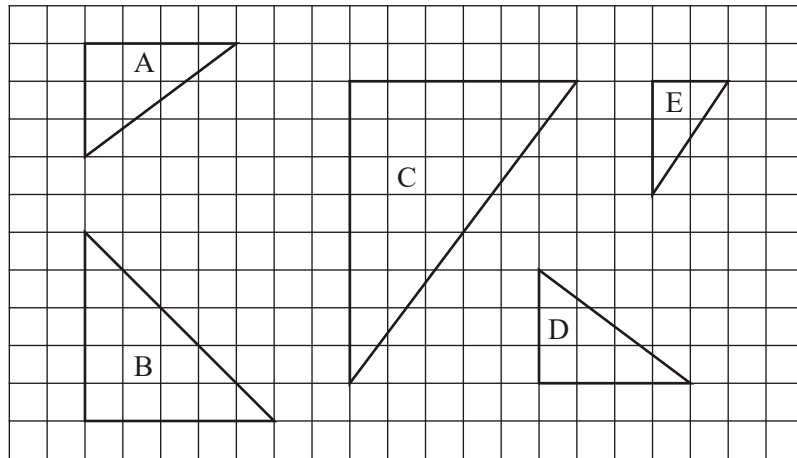
25.



Write down the special name for this quadrilateral.

.....
(Total 1mark)

26.



Two of the triangles are congruent.

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

..... and

(1)

One of the triangles is isosceles.

(b) Write down the letter of the isosceles triangles.

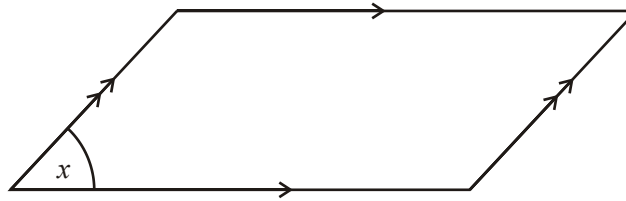
.....

(1)

(c) Draw a pentagon in the space below.

(1)
(Total 3 marks)

27.



- (a) Write down the mathematical name for this shape.

.....

(1)

- (b) Write down the mathematical name for the angle marked x .

.....

(1)**(Total 2 marks)**

28. Here is a sketch of a rhombus.

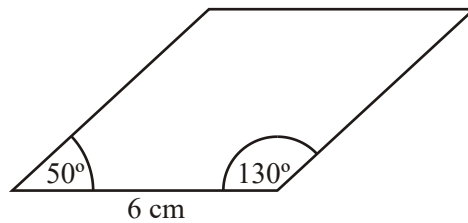


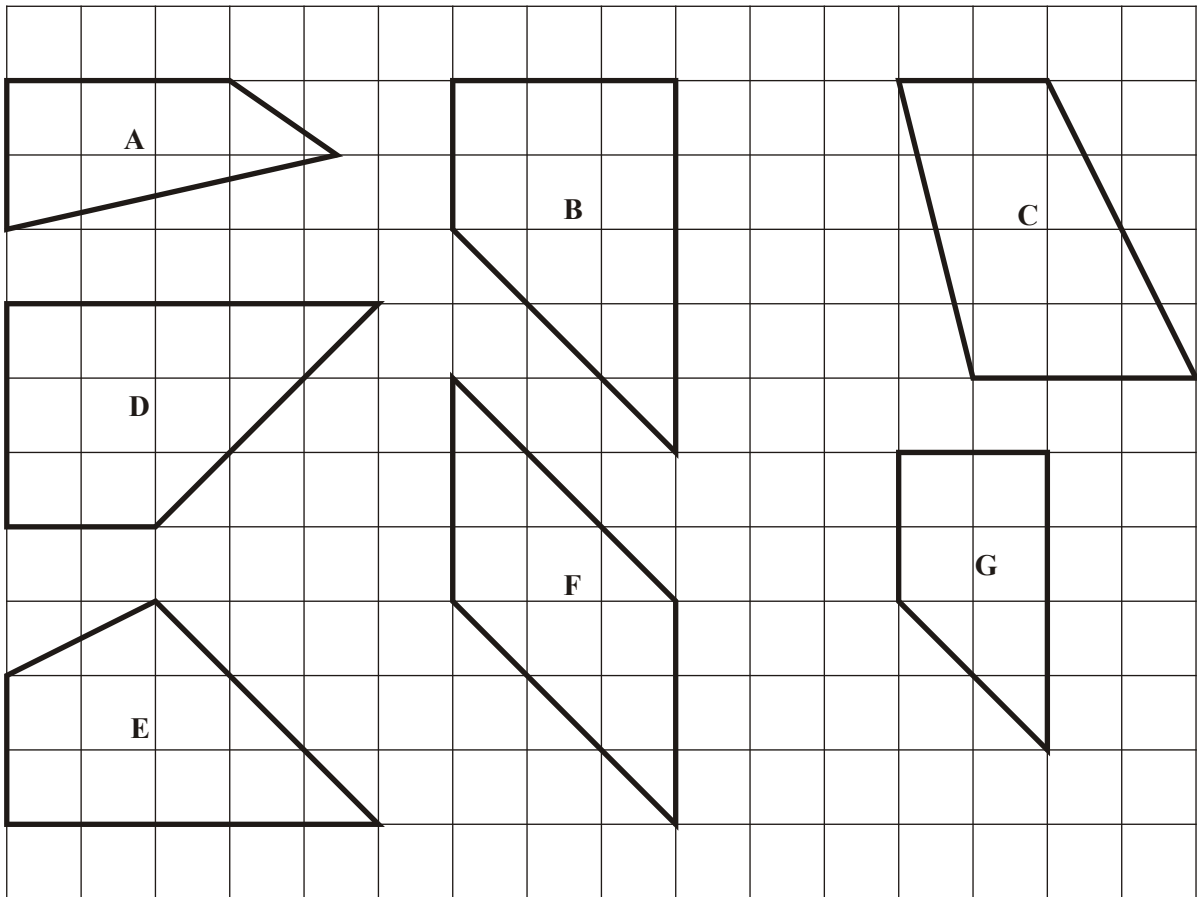
Diagram **NOT** accurately drawn

The rhombus has a side of length 6 cm.
One angle of the rhombus is 50° .
Another angle of the rhombus is 130° .

Use a ruler and a protractor to make an accurate drawing of the rhombus.

(Total 3 marks)

29. Here are 7 quadrilaterals.



(a) Write down the letter of a parallelogram.

.....

(1)

Two of the quadrilaterals are congruent.

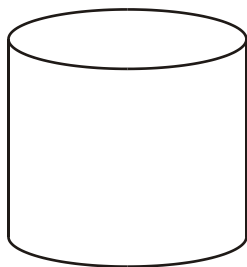
(b) Write down the letters of these quadrilaterals.

..... and

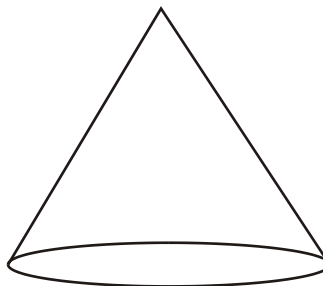
(1)

(Total 2 marks)

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



.....

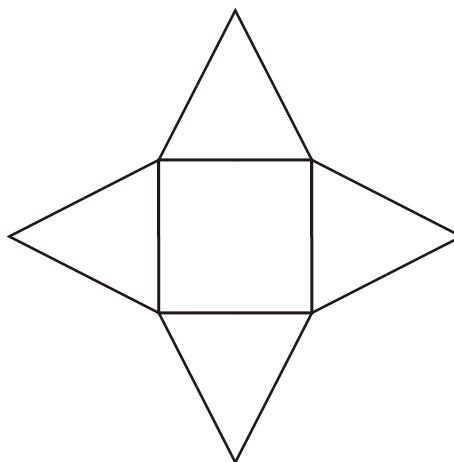
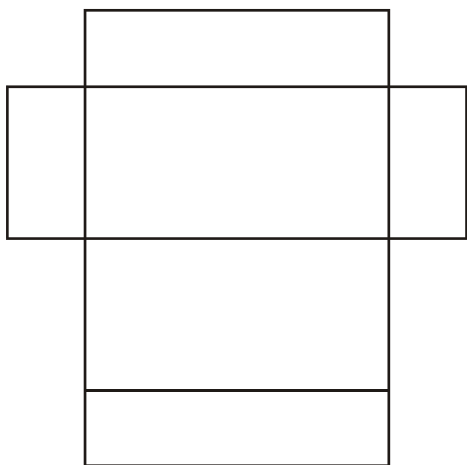


.....

(2)

Here are the nets of two different 3-D shapes.

(b)



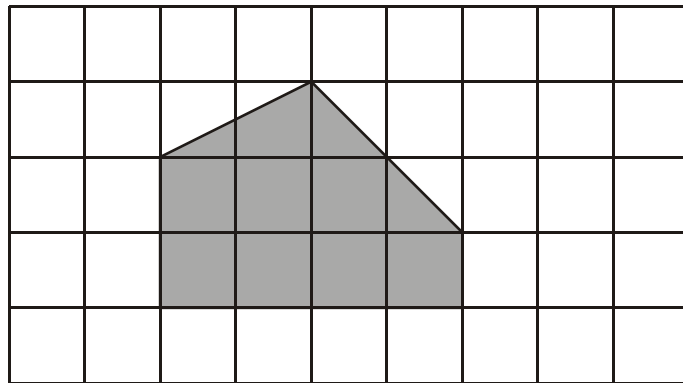
Write down the mathematical name of each of these 3-D shapes.

.....

.....

(2)
(Total 4 marks)

31. A shaded polygon has been drawn on the centimetre grid.



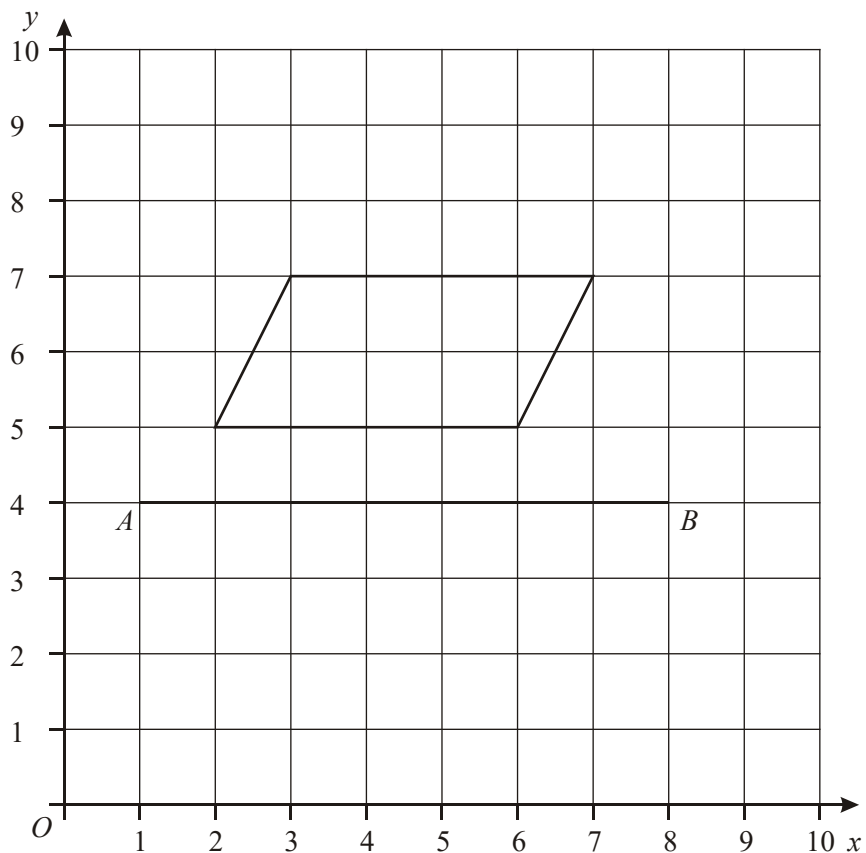
(a) Work out the area of the shaded polygon.

..... cm² (2)

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

..... (1)
(Total 3 marks)

32. A quadrilateral is shown on the grid.



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

.....

(1)

(b) Reflect the quadrilateral in the line AB .

(2)

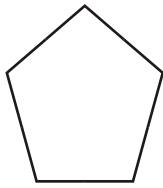
(c) Write down the coordinates of the point B .

(.....,))

(1)

(Total 4 marks)

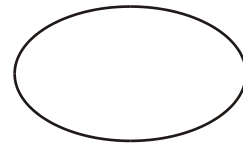
33. Here are nine shapes.



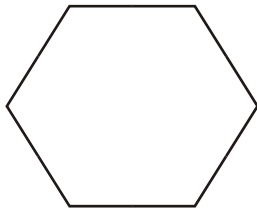
A



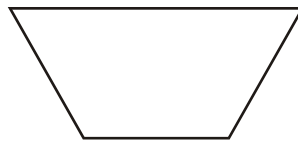
B



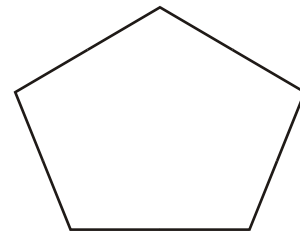
C



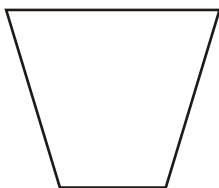
D



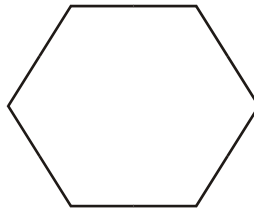
E



F



G



H



I

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

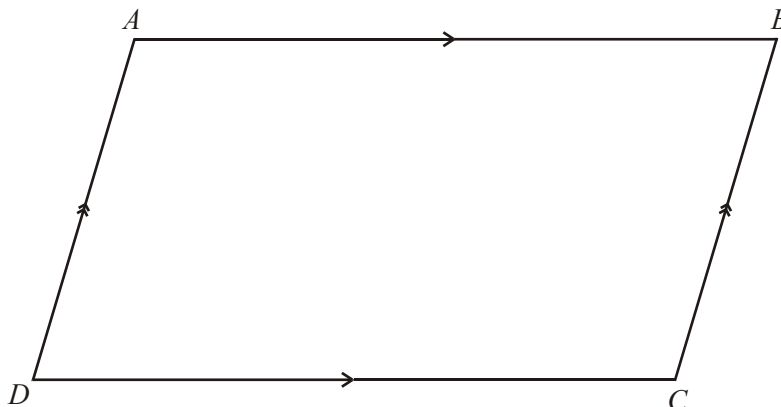
.....

(ii) Write down the letters of the pair of congruent shapes.

..... and

(Total 2 marks)

34. Here is an accurate drawing of a quadrilateral **ABCD**.



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

.....

(1)



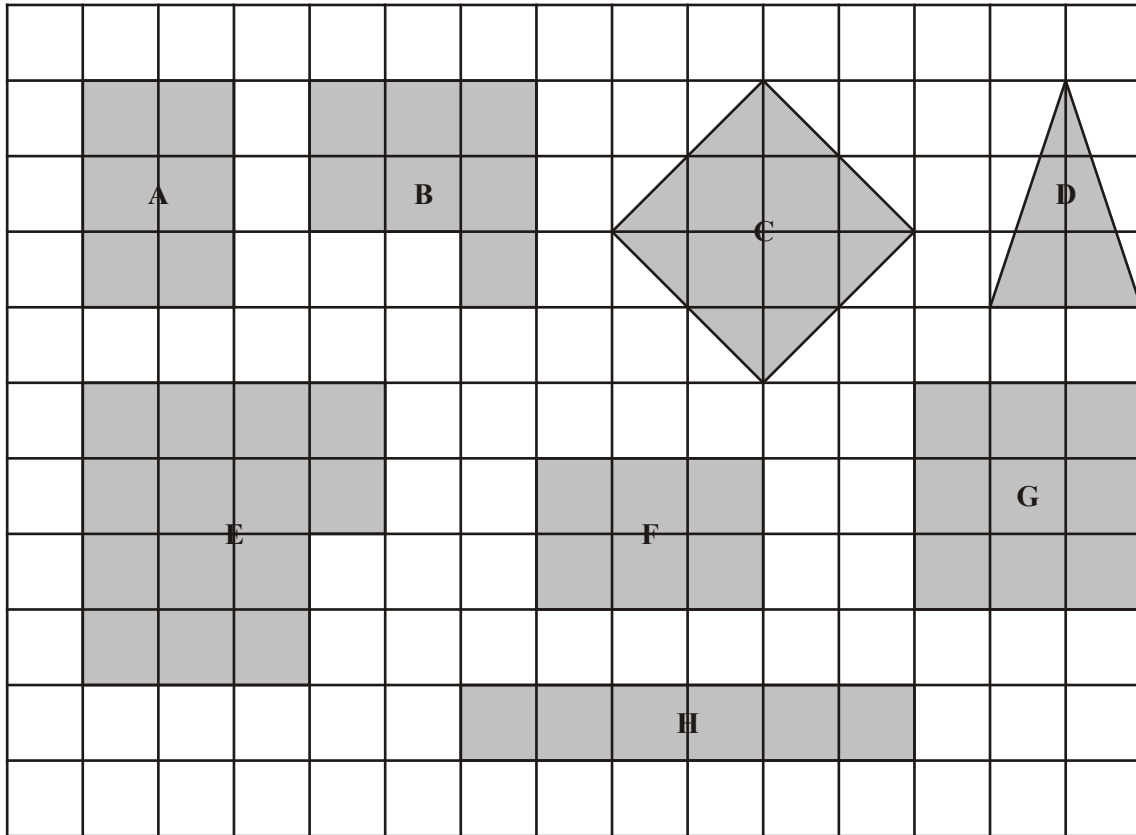
(b) Measure the length PQ .

.....cm

(1)

(Total 2 marks)

35. Here are 8 shapes on a grid of centimetre squares.



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

..... cm² (2)

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

..... (1)

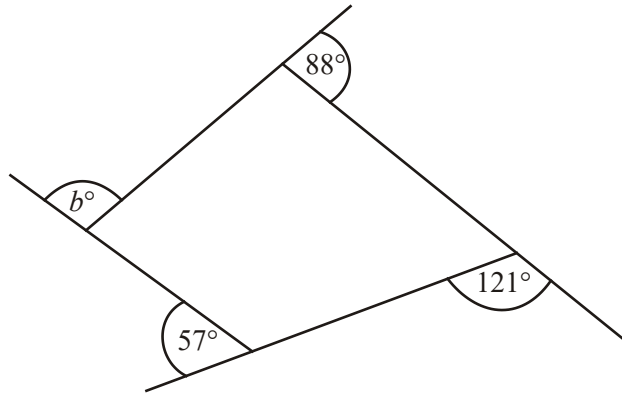
Two of the shapes are congruent.

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

..... and (1)
(Total 4 marks)

36. The diagram shows the exterior angles of a quadrilateral.

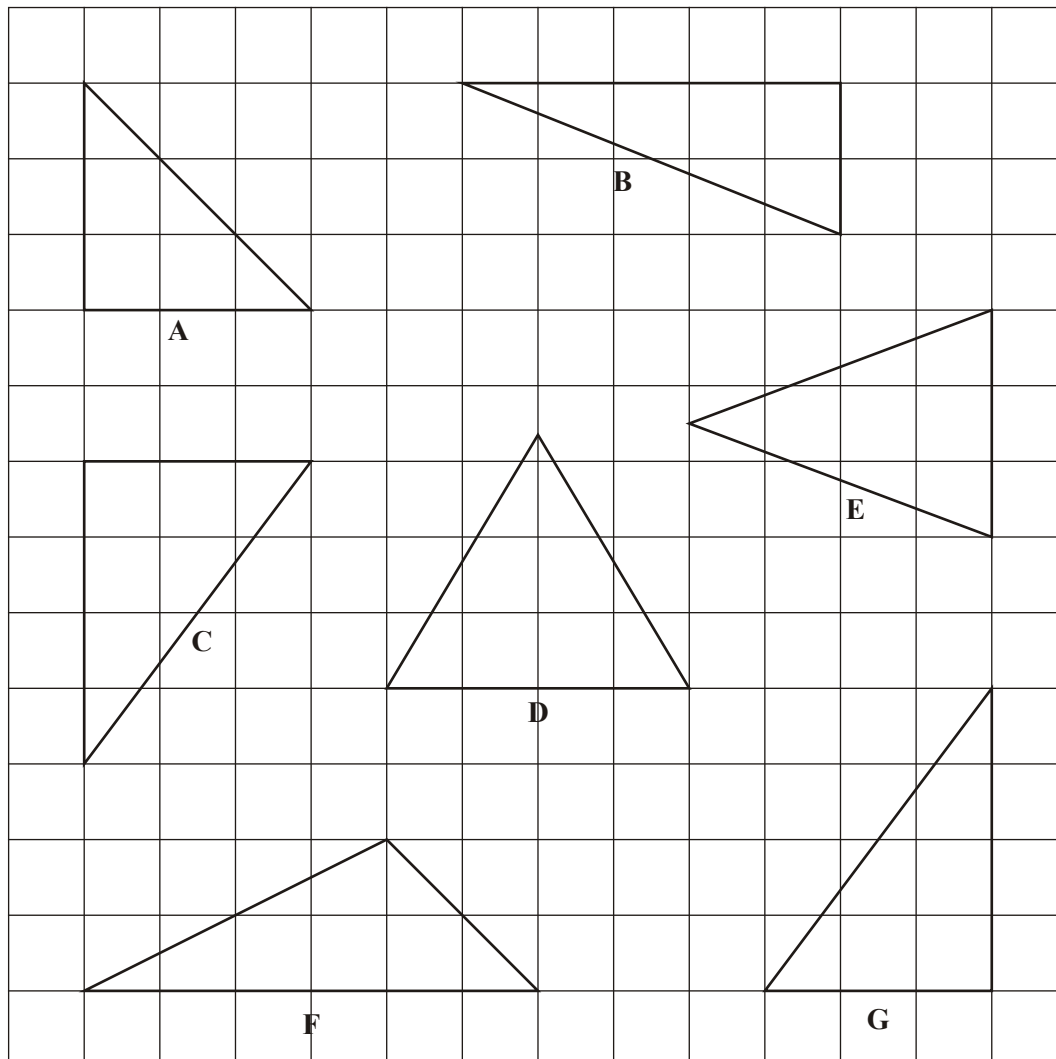
Diagram **NOT** accurately drawn.



Work out the value of b

$b = \dots\dots\dots$
(Total 2 marks)

37. Here are 7 triangles.



(a) Write down the letter of the triangle that is

(i) equilateral,

.....

(ii) both isosceles **and** right-angled.

..... (2)

(b) Write down the letters of the pair of congruent triangles.

..... and..... (1)
(Total 3 marks)

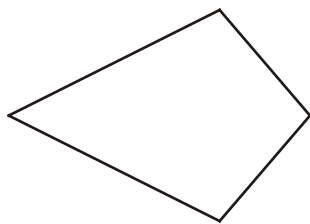
38. Here are some quadrilaterals.

Draw an arrow from each quadrilateral to its mathematical name.

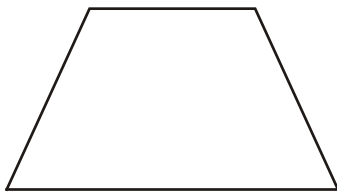
The square has been done for you.



rectangle

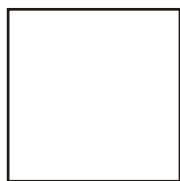


square



parallelogram

rhombus



kite

trapezium

(Total 2 marks)

39.

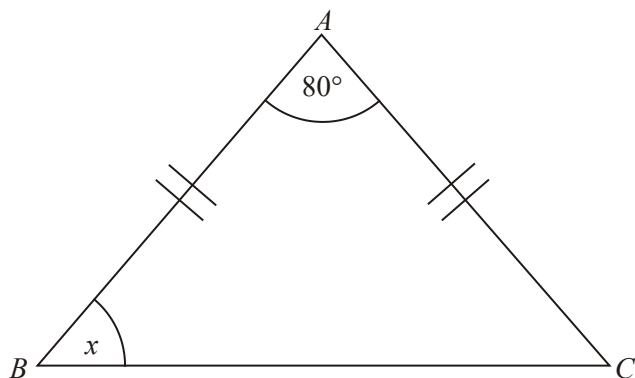


Diagram **NOT** accurately drawn

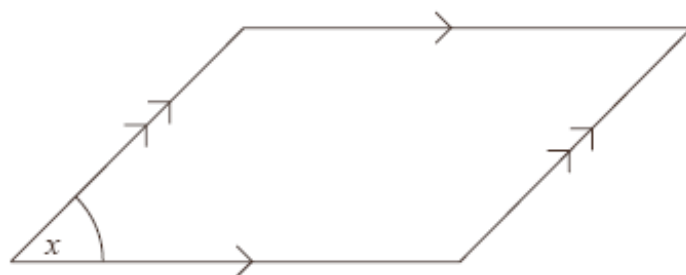
ABC is an isosceles triangle.

The angle marked x is 50°
Give reasons why.

.....

(Total 2 marks)

40.



(a) Write down the name of this quadrilateral.

.....

(1)

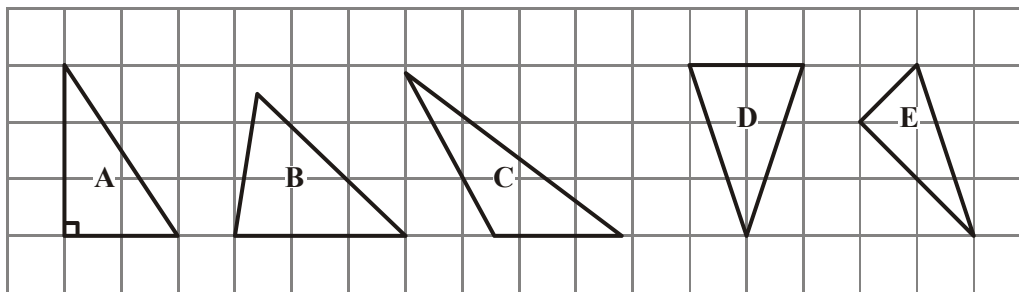
(b) Mark, with the letter B, an obtuse angle.

(1)

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

.....°
 (1)
 (Total 3 marks)

41. Which triangle is an isosceles triangle?



A B C D E

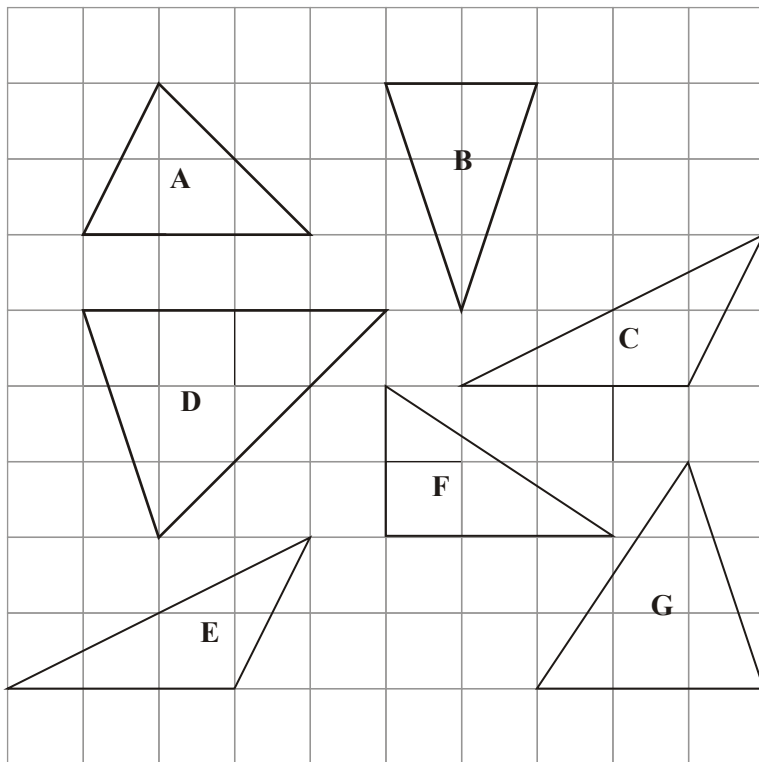
(Total 1 mark)

42. Complete each sentence.

(a) A square has four equal sides and its angles add up to° (1)

(b) An equilateral triangle has three equal sides and each angle is° (1)
 (Total 2 marks)

43. Here are some triangles.



(a) Write down the letter of the triangle that is

(i) right-angled,

.....

(ii) isosceles.

.....

(2)

Two of the triangles are congruent.

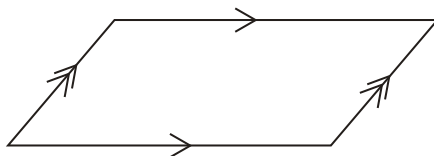
(b) Write down the letters of these two triangles.

..... and

(1)

(Total 3 marks)

44.



What is the special name for this quadrilateral?

rectangle

A

parallelogram

B

rhombus

C

kite

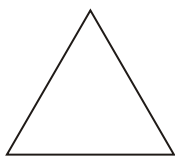
D

trapezium

E

(Total 1 mark)

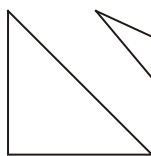
45. Which triangle is an equilateral triangle?



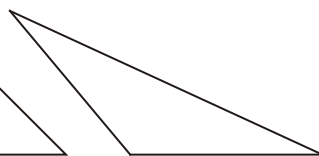
A



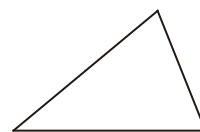
B



C



D



E

(Total 1 mark)

46. Which quadrilateral has exactly one pair of parallel sides?

Parallelogram

A

Rectangle

B

Kite

C

Trapezium

D

Rhombus

E

(Total 1 mark)

1. (a) parallel lines marked
BI

1

(b) right angle marked
BI

1

	(c)	(i)	acute <i>Bl</i>	1	
		(ii)	reflex <i>Bl</i>	1	
					[4]
2.	(a)		Trapezium <i>Bl cao ignore spelling</i>	1	
	(b)		(2, 3) <i>Bl cao</i>	1	
	(c)		Isosceles <i>Bl cao ignore spelling</i>	1	
	(d)		<i>Q</i> correct <i>Bl cao</i>	1	
					[4]
3.	(a)		60 <i>Bl cao</i>	1	
	(b)		120 $360 - 60 - 90 - 90$ <i>M1 for 360 - "60" - 90 - 90 or 180 - "60"</i> <i>Al cao</i>	2	
	(c)		12 6×2 <i>M1 for 6 × 2</i> <i>Al cao for 12</i>	2	
					[5]

4.	(a)	8		1	
			<i>B1 for 8</i>		
	(b)	Pentagon		1	
			<i>B1 for pentagon</i>		
					[2]
5.	(a)	Hexagon		1	
			<i>B1</i>		
	(b)	Right		1	
			<i>B1 cao</i>		
	(c)	Drawing		2	
			<i>B2 for 7 additional hexagons with at least 2 points at which 3 hexagons meet</i>		
			<i>(B1 for one point at which 3 hexagons meet)</i>		
					[4]
6.	(a)			3	
			<i>B3 all 3 correct</i>		
			<i>B2 2 correct</i>		
			<i>B1 1 correct</i>		
	(b)			2	
			<i>B2 at least 5 correct</i>		
			<i>(B1 two pairs together at a single point (ignore remainder of diagram))</i>		
					[5]
7.	(a)	hexagon		1	
			<i>B1 Condone spelling error</i>		
	(b)	Sum of angles at a point is 360°		2	
			<i>B1 for 360 seen</i>		
			<i>B1 for "point", "complete turn" or "a circle" or similar unless accompanied by an incorrect angle</i>		
			<i>SC If neither B1 scored, award B1 for a clear indication that the size of an angle, other than x, is 90° or a right angle (may be on diagram)</i>		

- (c) 136 2
 $30 \times 4 + 8 \times 2$
MI $30 \times 4 + 8 \times 2$ or attempt to sum 5 or 6 lengths
AI cao **[5]**
8. (a) (i) 143° 2
BI for $143 (\pm 2^\circ)$
- (ii) Obtuse
BI for obtuse (ignore spelling)
- (b) Accurate drawing 1
 See diagram
BI for accurate drawing $\pm 2\text{mm}$ **[3]**
9. (a) >>marked 1
BI (accept one arrow)
- (b) Acute angle marked with *A* 1
BI
- (c) Reflex angle marked with *R* 1
BI
- (d) 52 1
BI $\pm 2^\circ$ **[4]**
10. (a) Diameter drawn 1
BI for a diameter
- (b) Right angle marked 1
BI R marked correctly
- (c) Rectangle drawn 1
BI for a rectangle **[3]**

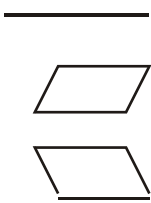
11. Shapes shaded on grid
6 tessellating shapes 2
*B2 for fully correct with 5 or more additional shapes, no gaps
(B1 for 4 shapes tessellating with at least one shape inverted,
with or without the given shape ignore extras)* **[2]**
12. (a) C or G 1
B1 at least one of C or G (no extras)
- (b) A and F 1
B1 cao
- (c) 2 1
B1 (accept -2) **[3]**
13. (i) 5
3 1
B1 cao
- (ii) 9 1
B1 cao
- (iii) 6 1
B1 cao **[3]**
14. (a) Isosceles 1
B1 for Isosceles (triangle) ignore spelling
- (b) Square 1
B1 ignore spelling
- (c) Diagram of trapezium 1
B1 for diagram of a trapezium **[3]**
15. (a) (i) Trapezium 1
*B1 Trapezium. Accept misspelling as long as the word given is
still recognisable.*

- (ii) Parallelogram 1
BI Parallelogram. Accept misspelling as long as the word given is still recognisable.
- (b) Acute 1
BI cao
- [3]**
16. (a) Trapezium 1
BI
- (b) 60 1
BI for 60 ± 2
- (c) obtuse 1
BI
- [3]**
17. (a) “angles on a line sum to 180° ” 1
BI for angles on a line sum to 180° , 180, $120 + 50 = 170$ etc
- (b) $360 - (70 + 130 + 100)$
 60 2
MI for $360 - (70 + 130 + 100)$
AI cao
- [3]**
18. (a) right angle marked 1
BI for the right angle marked with square or R
- (b) acute angle marked 1
BI for either (or both) of the acute angles marked
- (c) kite drawn 1
BI for a kite drawn
(accept square or rhombus or arrowhead)
- [3]**

19. (a) 9.0 to 9.4 1
BI
- (b) (i) 22 to 26 2
BI
- (b) (ii) Acute
BI
- (c) Symmetry line 1
BI (within overlay)
- [4]**
-
20. A and G
 C and E 2
B2 (BI each pair)
- [2]**
-
21. Square, kite, rhombus 2
BI + BI each correct answer
- [2]**
-
22. (a) (i) D 2
BI
- (ii) C
BI
- (b) B and G 1
BI
- [3]**
-
23. (a) parallel lines marked 1
BI
- (b) right angle marked 1
BI
- (c) acute 1
BI
- [3]**

24.	(a)	(i)	12		2		
				<i>B1</i>			
		(ii)	8				
				<i>B1</i>			
	(b)	net			3		
		<i>B3 for any correct net. See overlay.</i>					
		<i>(B2 for 3 different-sized rectangles drawn within overlay)</i>					
		<i>(B1 for 1 rectangle drawn within overlay)</i>					
		<i>SC: B1 for any net that folds (by eye) to give a cuboid.</i>					[5]
25.	parallelogram				1		
				<i>B1</i>		[1]	
26.	(a)	A and D			1		
				<i>B1</i>			
	(b)	B			1		
				<i>B1</i>			
	(c)	sketch			1		
				<i>B1 for sketch of pentagon</i>		[3]	
27.	(a)	Parallelogram			1		
				<i>B1</i>			
	(b)	Acute, interior			1		
				<i>B1</i>		[2]	
28.	construction				3		
		<i>B3 for fully correct rhombus within overlay</i>					
		<i>(B2 for a line of 6cm and angles of 50° and 130° within overlay)</i>					
		<i>B1 for a line of 6cm and one correct angle or angles of 50° and 130° within overlay)</i>					[3]

29. (a) F 1
BI
- (b) B and D 1
BI
- [2]**
-
30. (a) (i) cylinder 2
BI
- (ii) cone
BI
- (b) (i) cuboid 2
BI
- (ii) pyramid
BI
- [4]**
-
31. (a) 9 2
B2
- (b) Pentagon 1
(BI for 8 < answer < 10)
BI
- [3]**

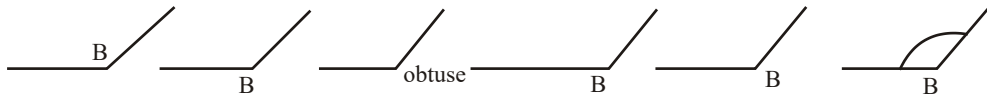
32. (a) parallelogram
B1 1
- (b)  2
B2 for correct reflection [coordinates (2, 3), (6, 3), (3, 1), (7, 1)]
(B1 for 3 points correct or correct orientation, incorrect position)
- (c) (8, 4)
B1 1
- [4]**
33. (i) **A or F**
B1 for A or F 2
- (ii) **D or H**
B1 for D or H 1
- [2]**
34. (a) Parallelogram
B1 1
- (b) 7.5
B1 for answer in the range 7.3 to 7.7 inclusive 1
- [2]**
35. (a) 8
M1 for counting squares (or answer between 7 and 9)
A1 cao 2
- (b) isosceles
B1 1

- (c) A and F 1
B1 for both **[4]**
36. $360 - (57 + 88 + 121)$ 2
 94°
M1 for $360 - (57 + 88 + 121)$ or $57 + 88 + 121 + b = 360$
A1 cao
[SC: B1 for with or without working] **[2]**
37. (a) (i) D 2
B1 cao
- (ii) A 1
B1 cao
- (b) C and G 1
B1 cao **[3]**
38. 2
B2 for all three quadrilaterals correctly identified
(B1 for two quadrilaterals correctly identified) **[2]**
39. $180 - 80 = 100$ angles in a triangle = 180° 2
 $100 \div 2 = 50$ isosceles triangle
B1 for angle sum of a triangle is 180°
(so other two angles are 100°)
B1 for isosceles triangles have two equal angles
(so each one is 50°) **[2]**
40. (a) Parallelogram 1
*B1 for parallelogram or trapezium ('parallel' is **not** enough)*

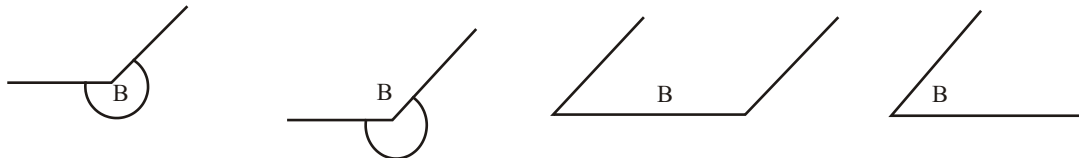
(b) Angle marked 1

B1 for the angle clearly marked with B or 'obtuse' or a clear indication as to the angle being referred to

In labelling the obtuse angle, the following would get the mark:



*In labelling the obtuse angle, the following would **NOT** get the mark:*



(c) 10 – 80 1

B1 for answer in range 10 – 80, inclusive (ie. an acute angle)

[3]

41. D

[1]

42. (a) 360 1

B1 cao

(b) 60 1

B1 for 60 or "the same" oe

[2]

43. (a) (i) F 2

B1

(ii) B 1

B1

(b) C and E 1

B1 for both

[3]

44. B [1]

45. A [1]

46. D [1]

1. Many candidates demonstrated their knowledge of parallel lines and right angles but the first two parts still proved far from trivial and, for a substantial number of candidates, exposed misunderstanding of at least one of these basic geometrical concepts. Most candidates gave the answer “acute” for part (c)(i) but, in part (ii), “obtuse” appeared much more often than the correct answer.

2. Parts (a) and (c) of this question were successfully answered by about 50% of candidates. There were a sizeable number who were apparently confused by the placement of the shapes on the diagram, despite the fact that the diagrams were clearly labelled, and gave ‘isosceles’ for their answer to part (a) and ‘trapezium’ for part (c). Correct answers were usually given to parts (b) and (d). Sometimes (2, 3) was given as (3, 2) and more commonly $(-4, -2)$ was plotted instead of the $(-2, -4)$ given.

3. The vast majority of candidates did not understand this question and few correct answers were seen. Part (b) was generally better answered than part (a). Part (c) was the most successful part with about 10% of candidates giving the correct answer. All too often candidates tried to measure the angles.

4. Mathematics A

- (a) Candidates at this tier always find the concept of a vertex difficult to remember. This year proved to be no exception. Only 17% gained one mark for this part.
- (b) This also proved to be too difficult for 75% of candidates. Many candidates thought it was a hexagon, some repeated polygon whilst others named some quadrilaterals or said it was a five sided shape.

Mathematics B Paper 14

Only 10% of the candidates could work out the number of vertices and surprisingly less than 30% could provide an answer that could be identified as 'pentagon' in part (b).

5. This question was well answered, although part (a) was sometimes not attempted and, when it was, "pentagon" appeared regularly. In part (b), the correct polygon was usually circled and many candidates gained both marks for the tessellation in part (c). If, however, other shapes, such as triangles, rhombuses or chevrons, were used or if there were gaps, then no marks were awarded. Some candidates lost a mark through drawing insufficient hexagons, while others went beyond the call of duty and covered the whole grid.
6. This was another well answered question. Nearly $\frac{3}{4}$ of all candidates gained full marks in part (a), with a minority giving only one additional shape (order 2). The candidates found (b) more challenging, in some cases presenting an arrangement of the kite shape in such a way as to leave gaps. Candidates who put the kites together in a repeating pattern usually went on to gain full marks.

7. Specification A

Many candidates were familiar with the term "hexagon" and scored the mark in the first part, minor spelling errors not being penalised. In the second part, a significant number of candidates did not appreciate that the question related to angle facts and instead referred to tessellations. One mark for the appearance of 360 was the most common award with fully correct responses being relatively rare. The final part was very well answered. Even those who tried to add the correct lengths but made an error scored one mark, if they showed their working, further evidence, if it were needed, of the advisability of doing this. 240 (30×8) was a common error and 38 ($30 + 8$) appeared occasionally.

Specification B

(b) This was another example of candidates not reading the question properly as a number of candidates focussed on giving the reason why some shapes tessellate and others do not, as their answer and not why the angle was 135° . Fewer than 25% of the candidates were able to score any marks on this question. The first mark could be scored either by recognising that there was a right angle (or a 90°) angle in the diagram or by realising that 360° was involved in the answer. Only 2% of the candidates were able to state that the sum of the angles around a point was 360° . Candidates need to be made aware that giving reasons requires more than just a calculation.

(c) Nearly two thirds of the candidates were able to provide the correct answer of 136. However many felt that the shape had 8 sides, 4 of which were 30cm in length and the other 4 all being 8 cm in length reaching a perimeter of 152 cm. Others merely multiplied 30 by 8 which led to an answer of 240.

8. Specification A

Less than 50% of candidates were able to measure and name the type of angle. 46% could measure the angle correctly with some giving the acute angle that was not marked and very many writing on their script that they did not have a protractor. Only 40% of candidates were able to say that the angle was obtuse. Part (c) was very poorly answered with only 17% of candidates able to complete the rhombus.

Specification B

This was perhaps the first challenging question for candidates. The indicated angle on the diagram was measured using a protractor within the range “141 to 145” and recognised as being an “obtuse” angle. The problems arose in part (b) which required the completion of the rhombus. A significant number were unsuccessful in their attempts. Either they did not know the shape of a rhombus or were unable to add two straight lines to the diagram in the correct position. It was not unusual to see either a “trapezium” or a “quadrilateral” or no attempt made.

9. Candidates understood this question, but they achieved differing success. 70% of candidates were able to mark the parallel lines and 63% were able to mark the acute angle. However only 29% could mark a reflex angle and only 31% could measure the angle correctly. It was unfortunate that many candidates indicated that they did not have a protractor with which to measure the angle. Candidates often confused a reflex angle with an obtuse angle.
10. This question was well understood but candidates often drew a radius in part (a). They were more successful with parts (b) and (c) being able to recognise a right angle and draw a rectangle. It was a pity that more candidates did not have a ruler as the rectangles were often drawn freehand. They were not penalised for this in this question.

11. Foundation Tier

The candidates sitting this paper had little concept of tessellating a shape. Almost all the candidates knew that they had to draw extra trapeziums but some found it difficult to continue the shape without gaps. The shape given was fairly easy to tessellate but candidates failed to realise that to complete the diagram the shape had to be inverted. Many candidates, therefore, were frequently happy to tessellate the shape in two columns of three with spaces in between.

Intermediate Tier

The majority of candidates understood what was required and many fully correct tessellations were seen. Few candidates obtained one mark. Those who were unsuccessful almost always failed to recognize that the trapezium could be inverted and produced a tiling pattern with gaps or simply drew 5 or 6 more shapes of varying sizes on the grid.

12. The terms “isosceles” and “congruent” are clearly not well understood. The first two parts of this question were answered correctly by about 25% and 35% of candidates respectively. Some candidates identified similar or right-angled triangles in part (b).

The scale factor was given correctly by only about one in four candidates. A common incorrect answer seen was “3”. However a significant number of candidates did not answer this part of the question.

13. The correct number of faces was found by a good proportion of candidates but finding the number of edges and vertices caused a great deal more difficulty. Candidates often either counted inaccurately or were confused by the terms used.
14. This question was, perhaps surprisingly, badly answered by many candidates. In particular part (b) was not very often recognised as a square. Many candidates thought that the equally marked sides were parallel. Some interesting shapes were seen for part (c) often not correct.
15. There were predictably many confused spellings associated with naming the shapes; examiners did not penalise incorrect spelling unless it led to ambiguity. Overall this question was not well answered, with many incorrect names given for the shapes. Part (b) was better answered, with about $\frac{2}{3}$ of the candidates naming the angle correctly. The most common error was in naming it as an obtuse angle.
16. This question was the first on the paper where a significant number of candidates did not give an answer to one or more parts. The shape was named correctly by 48% of candidates. Of those candidates who failed to gain a mark here, the majority stated that the shape was a parallelogram. 78% of candidates scored the mark for measuring the size of the angle marked x and 55% of candidates could correctly identify the angle marked y as an obtuse angle. Incorrect spellings were accepted in all cases where the candidate’s intention was clear and the answer unambiguous. Answers such as “obcute”, “obstute”, and “abcute” were not uncommon.

17. Although small numbers of candidates either left this question unanswered or merely repeated statements from the question, for example that the angles were not drawn accurately, the great majority of candidates could offer a clear and accurate explanation in part (a). It was good to see a high rate of success in part (b) with over three quarters of candidates gaining both marks. Common incorrect answers included 75° , apparently found by measuring the angle and 160° from those candidates who made an arithmetic error in their calculation and 180° from those candidates under the illusion that the sum of the angles in a quadrilateral is 380° .
18. Most parts of this question were well attempted, errors coming from not understanding the technical terms. For example in part (b) a minority of candidates marked obtuse angles. In part (c) it was important to draw a shape in which examiners could identify two pairs of sides that were approximately the same length, but those candidates who failed to use the grid as a guide, or whose diagrams were so roughly drawn failed to make this clear.
19. Most candidates were able to measure BC within the acceptable tolerances but the measuring of angle B in the triangle was poorly done. There seemed to be many types of response to the type of angle, the most frequent being *obtuse* and *isosceles*. Nearly all candidates could draw the line of symmetry correctly.
20. The word *congruent* was clearly not understood by a significant number of students. Many chose B and D (both triangles) and A and H (both squares) instead of the rotated congruent shapes.
21. Hardly any candidates scored full marks. Many responded *square* but then responded with *rectangle*, *trapezium*, various sorts of triangles and other shapes.
22. There was a mixed response to this shapes question. Part (b) was handled better than part (a). Candidates did not always relate *pentagon* to a 5-sided shape with the hexagon often being cited as the answer. There was some confusion as to whether shape C or I was the isosceles triangle.
23. Although most candidates scored some marks on this question many thought that the sloping line was parallel to the base. The alternate angle to x was often identified as a right angle and x was often said to be a left angle! Many gave a numerical answer to part (c).

24. Most candidates did not know the terms *vertices* and *edges* although there were some correct answers given and some reversed the answers in (a).
In part (b) many tried to draw the cuboid accurately in 3D. There were some good responses with accurate nets being drawn, although some drew a net made up from only 2 different faces rather than 3.
25. There were a surprising amount of incorrect answers (mostly rhombus or some other type of quadrilateral) whilst many left the answer space blank. The answer of parallelogram was rarely seen.
26. Many candidates did not understand the word 'congruent' and answered B and D. The isosceles triangle needed for part (b) also proved to be a problem. In part (c) a hexagon was most commonly drawn although there were quite a few pentagons drawn.
27. Just over a third of the candidates gave correct answers of *parallelogram* in (a) with many different spellings of the answer! Many candidates responded with *rhombus* or *trapezium* both words being used elsewhere in the paper... *rhombus* used in question 8 and *trapezium* seen on the formula sheet. These two incorrect answers were often spelt correctly!
Most candidates had a go in (b) but there was a split between responses of *acute*, 50° , *obtuse* and *right angle*.

28. Paper 8

Most candidates attempted to draw a quadrilateral of some description and were able to earn one mark by getting either two angles or one angle and one line within the accepted tolerances. Over 40% of the candidates were able to score 2 or more marks on this question. It was disappointing to note how many freehand lines were drawn even when the question specifically stated that a ruler and a protractor were to be used. The most common error was not making all the lines of length 6cm. Candidates clearly need more practice in providing accurate constructions.

Paper 9

Only a few (18%) failed to score at least 1 mark, and most scored 2 (42%) or 3 (31%). The accurate drawing of a line of length 6 cm and a correct angle, usually meant that a second angle was automatically correct (by drawing a parallel line) thus gaining 2 marks. Failure to gain the final mark was often a result of completing a parallelogram and not a rhombus (with equal sides).

29. Many were able to select the letter **F** for the parallelogram and nearly 60% of the candidates were able to pair together **B** and **D** for the congruent quadrilaterals thus scoring full marks for this question.
30. Naming a mathematical shape always produces strange and wonderful names and this year was no exception. Going for the simple *cylinder* and *cone* in part (a) was often overlooked. The cylinder became an ‘oval’ even though the question asked for a 3-D shape. The cone became a ‘triangle’ in spite of its elliptical base. Offerings like ‘tricylinder’ and ‘prymaid’ were not unusual. Naming the shapes in (b) proved more difficult with less than 20% obtaining both marks in (b) as opposed to 47% obtaining both marks in (a).
31. (a) Working out the area of the polygon required an allowance to be made for the partially shaded squares. Although there was little evidence of calculations the correct answer of ‘9’ appeared in over 60% of the responses. The most common incorrect area was ‘11’ and arose through counting how many squares had been completely or fractionally shaded.
(b) The mathematical name of the shape was recognised as being a ‘pentagon’ in only 17% of the responses. For some ‘trapezium’ was suggested. Others chose to use the word ‘polygon’, which had been given in the question, whilst variations on this were also in evidence with ‘polygoner’, ‘polygram’ and ‘poligonic triangle’ appearing.
32. Only 30% of candidates were able to correctly identify the parallelogram in (a). The notion of ‘keep it simple’ needed to be applied rather than the inventiveness of some of the responses. Names like ‘fryperium’, ‘tolaruis’ and ‘quadril’ are written more in hope than in expectation! In part (b) over half the candidates were able to score one mark by either providing 3 correct vertices or reflecting the parallelogram in another horizontal line, generally the line $y = 5$ with just under half the candidates scoring both marks. The most common incorrect response was to translate the shape downwards.
In part (c) two thirds of the candidates provided the correct answer of (8, 4) with most of the incorrect answers being (4, 8).
33. Over two thirds of the candidates recognised that either shape A or shape F were pentagons with shape D being the most common incorrect response. Many thought that congruence meant that the shapes were both pentagons (A and F) or trapeziums (E and G). However nearly 70% of the candidates did recognise that shapes D and H were congruent.
34. It was disappointing to find that even when any recognizable form of ‘parallelogram’ was given the mark, only a third of the candidates were able to score a mark in part (a). There was a great deal more success with measuring the line although quite a few candidates put 75, not fully understanding the difference between mm and cm.

35. Finding the area of the square was dealt with correctly by two-thirds of candidates using the method of counting grid squares. Naming the triangle in part (b) was rather more of a challenge with only half the candidates obtaining an answer that could be identified as 'isosceles'. Apart from the numerous different spellings of 'isosceles', which were rewarded, a variety of other names were given. The special name for the triangle was written as 'triangle', 'quadrilateral' and even 'trianglepezium' along with attempts at 'equilateral' which left me still trying to visualise a 'suarpizseim'! Recognition of congruent shapes in part (c) produced the correct answers in just under 60% of cases with many incorrectly selecting shapes B and E.
36. No report available.
37. Well over 70% of the candidates were able to recognise that D was an equilateral triangle but less than a $\frac{1}{4}$ of the candidates were successful in (a)(ii). Many gave separate answers for isosceles and right-angled whilst others gave one letter but the letter tended to correspond to only one of the requirements of the triangle. Over 60% were able to identify the pair of congruent triangles.
38. Most candidates were able to correctly draw an arrow from two of the quadrilaterals on the left to its mathematical name. However there were many who could not get all three correct. The mean mark for this question was 0.99.
39. Candidates struggled to express themselves when trying to provide reasons why the angle marked x was 50° . Most were able to access one of the marks by stating that the angles in the triangle added to 180° but many had difficulty with expressing that the base angles were the same. Many referred to the 'parallel lines' that were marked whilst others took the approach of writing that x was given as 50° which meant that angle C was also 50° .
40. (a) It was disappointing to see so many candidates failing to recognise the quadrilateral as a parallelogram (or trapezium). Common errors were rhombus, equilateral and square. In part (b) acute and obtuse angles were often confused. A notable minority labelled one of the parallel symbols as their choice of obtuse angle. Part (c) was well answered.

41. No Report available for this question.
42. It was disappointing to find that only 26% of the candidates got both parts correct although 48% did manage to score 1 of the available marks. The most common incorrect response to both parts was 180° with candidates clearly not reading part (b) with care.
43. Part (a) this question was well understood with 64% of candidates gaining full marks. A small percentage of candidates (8%) scored no marks as they thought triangle A was right-angled and triangle G was isosceles. This was probably to do with the orientation of the given shapes. Part (b) was also well done with 80% of candidates obtaining the mark though a some candidates thought that triangles G and D or A and C were congruent.
44. No Report available for this question.
45. No Report available for this question.
46. No Report available for this question.