1.

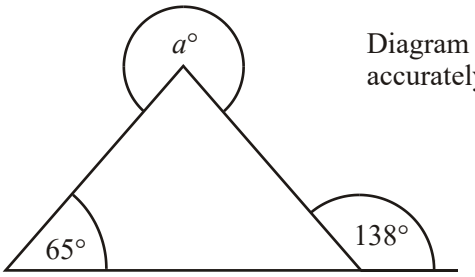


Diagram **NOT** accurately drawn

Work out the value of a.

a = ...

(Total 3 marks)

2.

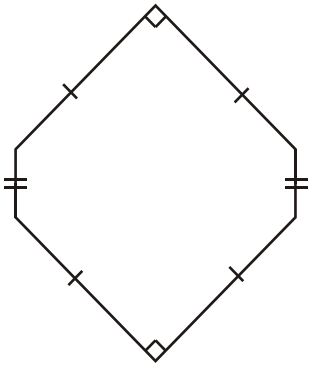


Diagram **NOT** accurately drawn

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.

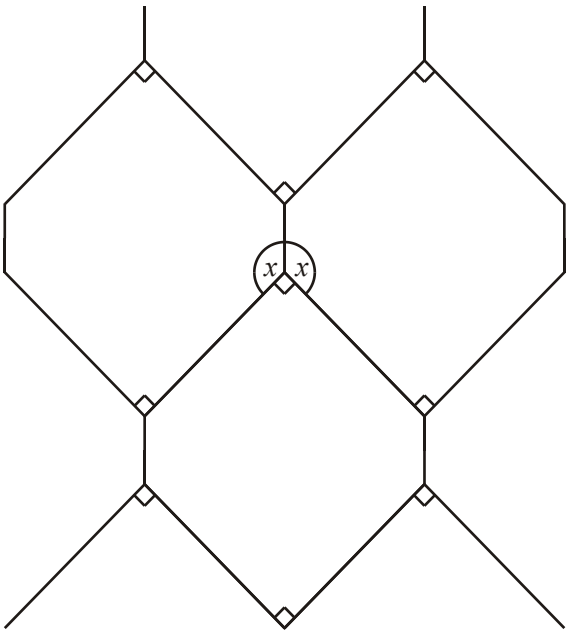


Diagram **NOT** accurately drawn

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

(b) Give reasons why.

……...

……...

……...

(2)

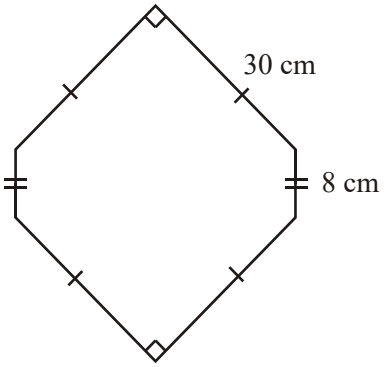


Diagram **NOT** accurately drawn

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)

3. The diagram shows a 5-sided shape.

All the sides of the shape are equal in length.

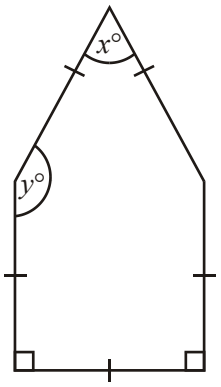


Diagram **NOT** accurately drawn

(a) (i) Find the value of x.

x = ……..

(ii) Give a reason for your answer.

…….

(2)

(b) Work out the value of y.

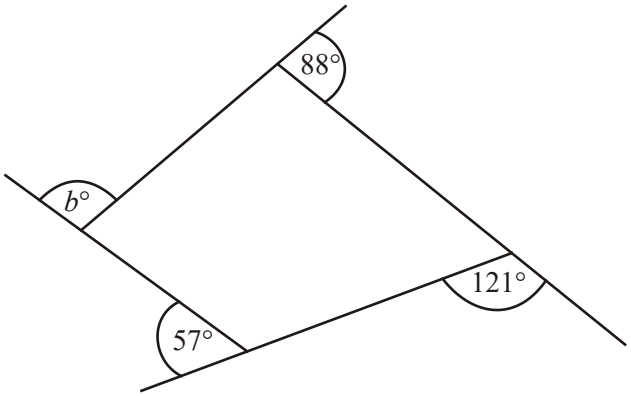
y = ……..

(2)

(Total 4 marks)

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

Diagram **NOT** accurately drawn.



Work out the value of b

b = ...

(Total 2 marks)

5.

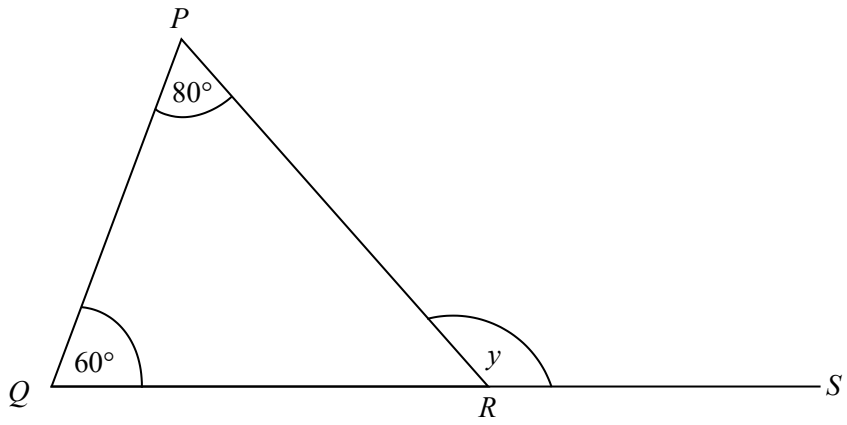


Diagram **NOT** accurately drawn

PQR is a triangle.
QRS is a straight line.
Angle *P* = 80°
Angle *Q* = 60°

Find the size of the angle marked *y*.

y = ...°

(Total 2 marks)

6.

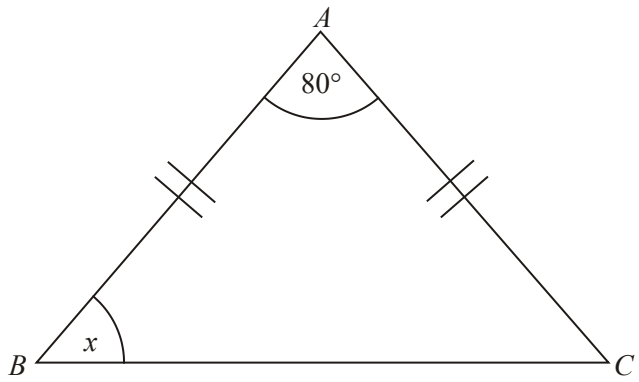


Diagram **NOT** accurately drawn

ABC is an isosceles triangle.

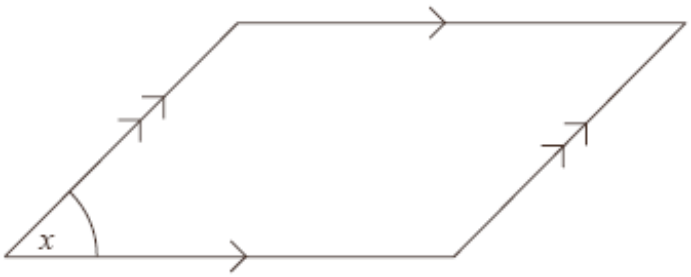
The angle marked *x* is 50º
Give reasons why.

.....

.....

(Total 2 marks)

7.



(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)

1. 287 3

138 – 65 = 73
360 – 73

M1 180 – 138 = 42°, 107° seen
M1 180 – (65+"42") = 73° seen
A1 for 287° cao

[3]

2. (a) hexagon 1

B1 Condone spelling error

(b) Sum of angles at a point is 360° 2

B1 for 360 seen
B1 for "point", "complete turn" or "a circle" or similar unless accompanied by an incorrect angle
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)

(c) 136 2

$30 \times 4 + 8 \times 2$

M1 $30 \times 4 + 8 \times 2$ or attempt to sum 5 or 6 lengths
A1 cao

[5]

3. (a) (i) 60 2

B1 cao

(ii) eg top triangle is equilateral

B1 for reason

(b) 150 2

M1 for $\frac{180-"60"}{2} + 90$

A1 ft from (a)(i) if x < 90

SC B1 for "60" + 90 if x < 90

[4]

4. 360 – (57 + 88 + 121)

94° 2

M1 for 360 – (57 + 88 + 121) or 57 + 88 + 121 + b = 360

A1 cao

[SC: B1 for with or without working]

[2]

5. 60 + 80 or 180 – (180 – 60 + 80) 2

= 140

M1 for 60 + 80 or 180 – (180 – 60 – 80) or 40 seen, or 140 seen in the working

A1 cao

[2]

6. 180 – 80 = 100 angles in a triangle = 180° 2

100 ÷ 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]

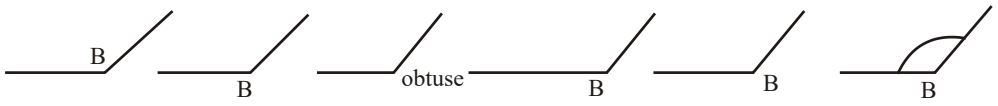
7. (a) Parallelogram 1

*B1 for parallelogram or trapezium ('parallel' is **not** enough)*

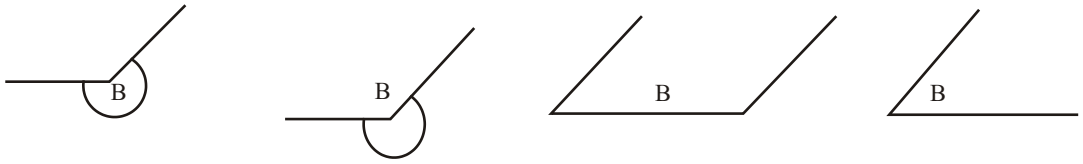
(b) Angle marked 1

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]

1. The greatest error was by those candidates who thought that the surn of the angles in a triangle is 360°. A significant minority (about 10%) arrived at the acute angle at the apex (73°) but then failed to realise that the reflex angle was needed. Candidates who assumed that the triangle was isosceles gained few marks. Overall this was a well answered question, with nearly half the candidates gaining full marks.

2. **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.

3. Specification A

Foundation Tier

In the first part, which was often not attempted, few candidates recognised the equilateral triangle and the size of the angle was generally obtained by guesswork or based on false reasoning. There was a wide range of answers, usually but not always acute. Although it was stated that the diagram was not accurately drawn, some candidates nevertheless measured the angle and obtained an answer near to the correct one. Candidates who correctly gave 60 as their answer did not always give a correct reason but, more surprisingly, an incorrect angle was sometimes followed by a correct reason.
The second part also caused difficulties. Those who had gained the mark for 60 in the first part often added 90 to obtain the correct value of y. However, it was not unusual to see an incorrect value of x followed by a correct value of y. Candidates did not always appreciate that they were looking for an obtuse angle. Both acute and reflex angles were seen. 45 in part (a)(i) followed by 135 in part (b) was quite common. As in the first part, some candidates obtained their answer by measuring the angle.

Intermediate Tier

Part (a) was well answered by candidates who recognised that the triangle was equilateral. Those who failed to notice this frequently identified angle x as 90°. There was some improvement in the overall quality of explanations, with fewer candidate merely quoting calculations. However, these explanations did not always focus on the properties of the diagram, with many making reference too isosceles triangles, or parallel sides, suggesting that more emphasis might need to be placed on work related to technical language. Many mentioned the equal sides and/or the equal angles but not always the word “equilateral”. In part (b) most candidates followed-through correctly using their answer from part (a), or showed an understanding that 90° should be added to their answer in (a).

Specification B

Many recognised that the diagram was made up of an equilateral triangle and a square and correctly found the size of angle x in part (a), giving a valid reason. A common error here was $x = 45°$ or $x = 90°$.
A correct answer of $x = 60°$ usually led to a correct answer in part (b). Many also gained full credit here for correctly following through their answer from (a)(i) by finding the base angles of what they considered to be an isosceles triangle. Those candidates who thought that the three angles in an equilateral triangle was something other than 60° could score one mark for adding 90° to their value for x.

4. No report available.

5. Most candidates scored one mark on this question, generally for writing 40° somewhere or 140° somewhere with something else in the answer space. Hardly any candidates showed that they knew the exterior angle of the triangle was equal to the sum of the interior opposite angles. A common incorrect response was to subtract 60° from 180°, reaching an answer of 120° because they thought that y and 60° were two angles on a straight line so their sum must be 180°. The mean mark on this question was 0.85.

6. 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°.

7. (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.