Name: _____

Foundation Unit 6 topic test

Date:

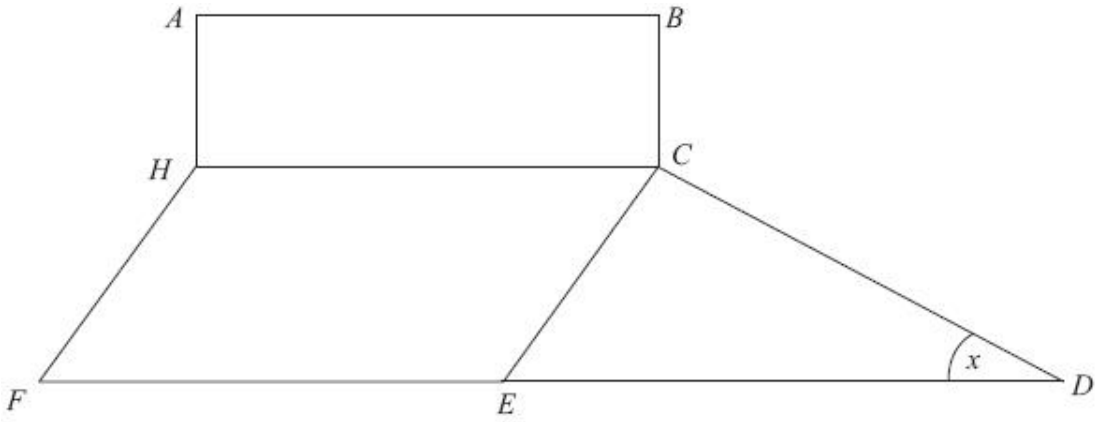
Time: 45 minutes

Total marks available: 39

Total marks achieved: _____

Questions

Q1.
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* ?

. . . . . .

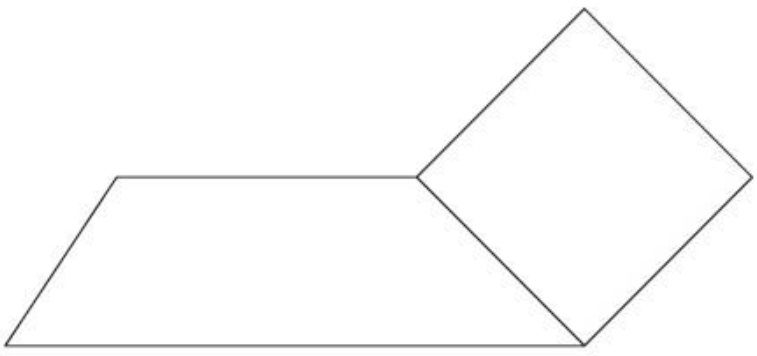
(1)

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

(1)

(Total for Question is 3 marks)

Q2.
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.

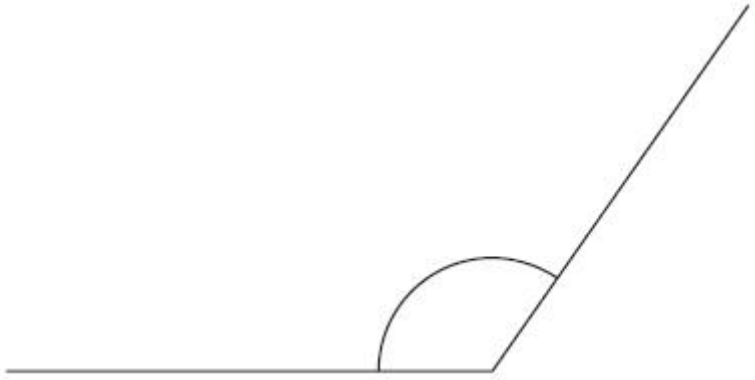
(1)

(Total for Question is 3 marks)

Q3.

An angle is marked below.

(i) What type of angle is it?



.....

(ii) Measure the size of the angle.

.....°

(Total for question = 2 marks)

Q4.

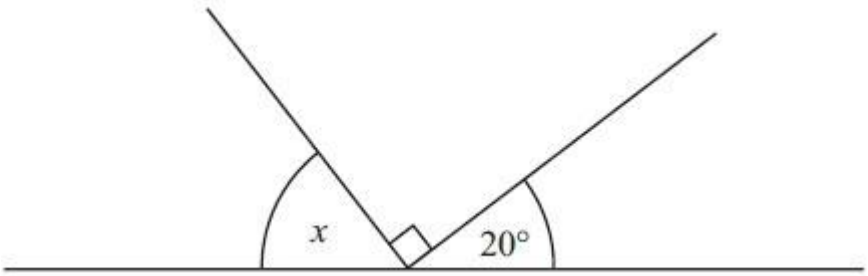


Diagram **NOT** accurately drawn

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

. . . . . .°

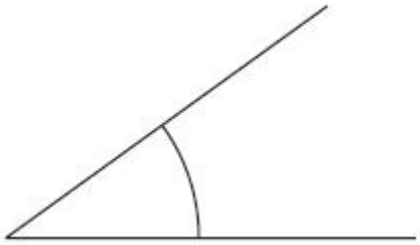
(ii) Give a reason for your answer.

.....

(Total for Question is 2 marks)

Q5.

Here is an angle.



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

.....

(1)

(b) Write down the size of the angle marked *x*.

..... °

(1)

(Total for Question is 2 marks)

Q6.

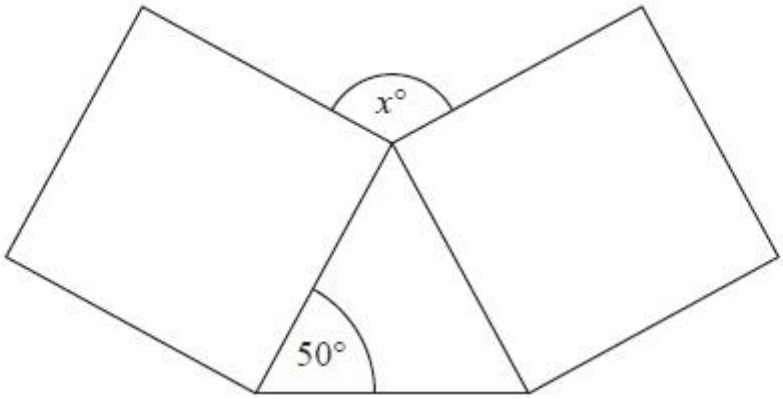


Diagram **NOT** accurately drawn

The diagram shows two identical squares and a triangle.

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

..... °

(Total for question = 4 marks)

Q7.

*

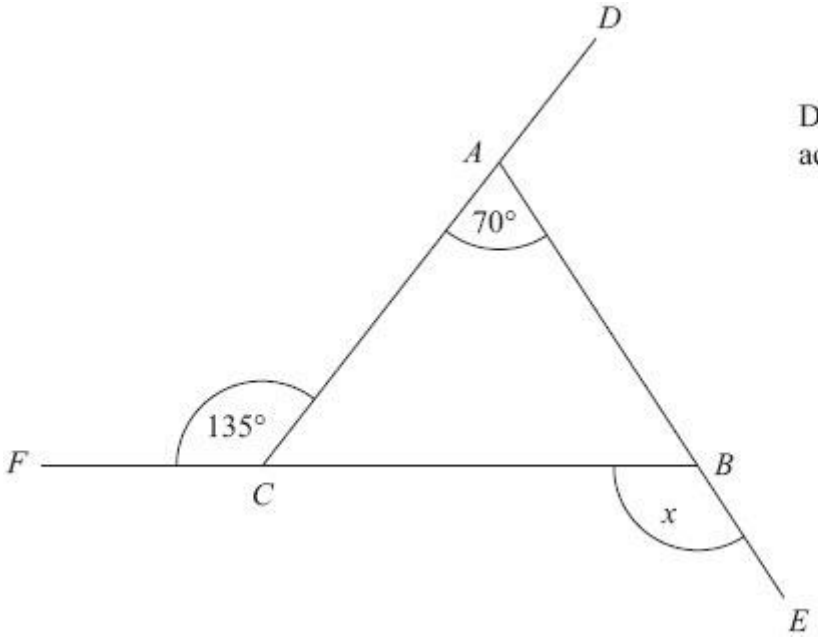


Diagram **NOT** accurately drawn

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 is 5 marks)

Q8.

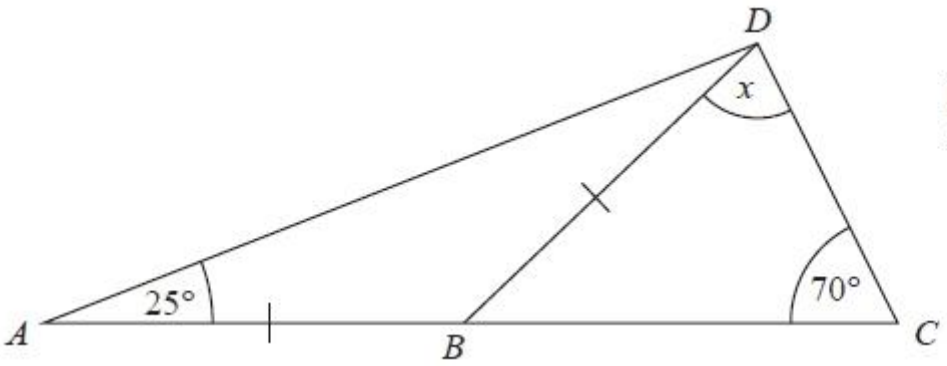


Diagram **NOT** accurately drawn

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 is 4 marks)

Q9. *

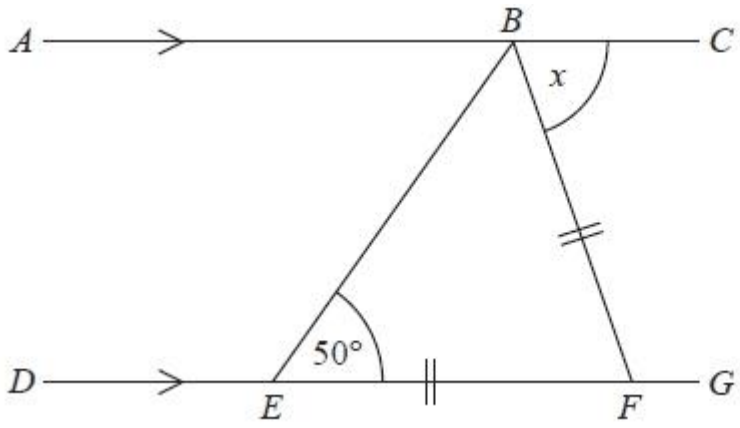


Diagram **NOT** accurately drawn

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 is 4 marks)

Q10. *

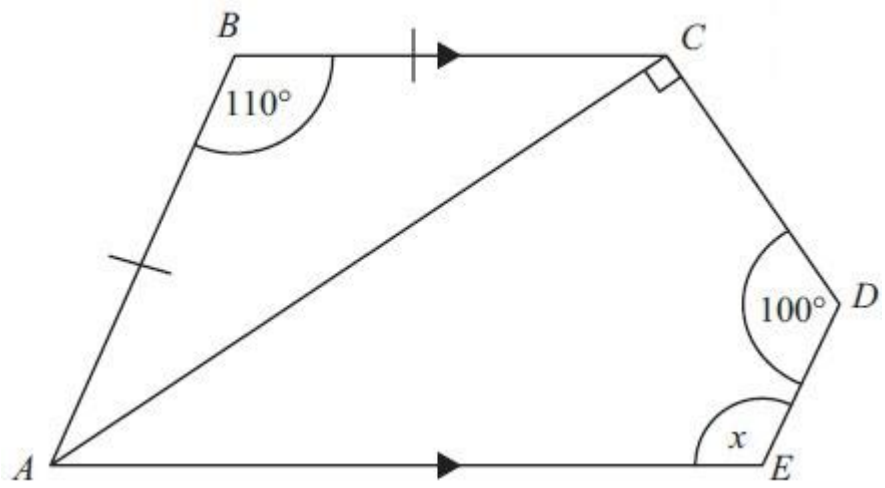


Diagram **NOT** accurately drawn

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

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

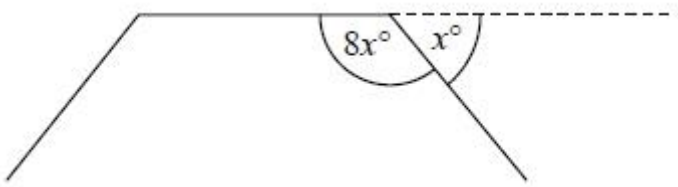
AE is parallel to *BC*.

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

(Total for Question is 4 marks)

Q11.

The diagram shows three sides of a regular polygon.



The size of each exterior angle of the regular polygon is $x°$.
The size of each interior angle of the regular polygon is $8x°$.

Work out the number of sides the regular polygon has.

(Total for question = 3 marks)

Q12.

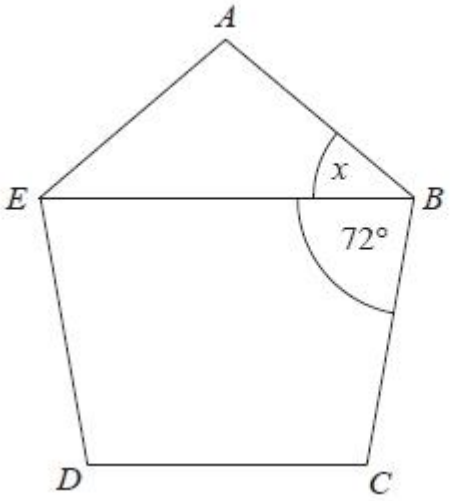


Diagram **NOT** accurately drawn

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 = 3 marks)

Examiner's Report

Q1.

This question was well answered. In parts (a) & (c) some answers were spoilt with multiple lines and angles being indicated, but this was not common.

Q2.
This was an accessible question for most candidates. It allowed candidates a positive start to the paper. Some pupils tried to show all sets of parallel lines but generally approached the question in a sensible manner.

Q3.

Most students identified the angle in part (i) as being obtuse. Not surprisingly, the most common incorrect answer was 'acute'. Part (ii) was also answered very well. A small number of students read their protractor incorrectly and gave an answer in the range 53° to 57°. The answers given suggested that almost all the students had a protractor.

Q4.

A straightforward question but 36% of candidates did not score any marks and then only 30% were able to write down that the angles in a straight line add up to 180°

Q5.

This question was well attempted with few blank responses and most students gained all three marks. Common incorrect responses in part (a) were obtuse and right-angle, in part (b) the only repeated errors were 100 or 360 − 100 = 260

Q6.

A good proportion of students were able to find the size of the angle marked x°. Some students gave the other base angle of the triangle as 50° and worked out the third angle as 80° but then got no further. Some, however, wrongly assumed that the two unknown angles in the triangle were equal. It was good to see angles marked on the diagram but the working of some students was not presented particularly well and was sometimes difficult to follow.

Q7.

This question had a mixed response. The most popular approach was to calculate the internal angles of the triangle.

A significant number of candidates thought that the triangle was isosceles (some thought that it was equilateral). A common incorrect approach here was to either calculate the angle *ACB* correctly as 45 degrees and then state the angle *ABC* as 45 degrees or to calculate both the angles *ACB* and *ABC* (ie the 'base angles') as 55 degrees.

Few candidates were able to state the reasons for their calculations correctly, often omitting to use the word angle, eg 'the triangle is 180 degrees'.

Candidates should be advised to state the reasons for their calculations with the calculation, not at the end when it is unclear which calculation is being justified by the reason.

Most candidates were able to identify their calculations clearly with the angles by simply labelling the diagram, but candidates not using this approach should be advised to use a suitable unambiguous notation, eg labelling the internal angles *a* and *b*, to identify the angles. Most candidates gave their final answer in the form *x* = …

Q8.

Only a few fully correct answers were seen because reasons, containing all the key elements, were rare. When reasons were given they were seldom all given. If attempted, angles in a triangle add up to 180° and angles on a straight line add up to 180° were generally correct, however 'isosceles triangle equal to 25 since 2 parallel sides' was the most common quote for the rarely mentioned isosceles triangle.
A common method used was to start with the large triangle to give 25+70=95 then 180-95=85 unfortunately they then said *x*=85 so no marks could be awarded.

It was rare to see "angle *ADB*=25" written down but 25 was seen labelled in the diagram and this received 1 mark.

Q9.

This question was well attempted with few blank responses seen but many students failed to gain full marks. Those that did correctly identify angles on the diagram which led to *x* = 80° were on the whole unable to list all the appropriate reasons using correct words. Many students were still incorrectly referring to alternate angles as Z angles, some described a method and others missed key words out of their reasons, the most common of which was the word 'angles'. Weaker students where often able to identify at least one correct angle on the diagram, usually *ABE* = 50°, but then incorrectly labelled *EFB* = 50° or incorrectly labelled *EAF* and *EFB* as 65°. Those that used the diagram were more successful as it was often difficult to identify which angles students were finding from their working out alone.

Q10.

A surprising number of candidates (9%) scored one mark in this question, either for correctly calculating the missing angles in the isosceles triangle *ABC* or for finding the alternate angle *CAE*. Two marks were obtained for obtaining both angles and this was achieved by 4% of candidates. The 10% of candidates that found the missing angle *x* scored 3 marks but only 0.6% of candidates could state the reasons correctly. Few candidates use the three letter notation to identify angles. Some candidates used Z angles in their explanation which is no longer acceptable for alternate angles.

Q11.
No Examiner's Report available for this question

Q12.

This question was well attempted by most students, but more often than not, they did not achieve full marks. Common incorrect responses were from students who did not realise that it was necessary to calculate the interior or exterior angle of the pentagon in order to calculate the value of *x*. Other common incorrect responses included, assuming all angles in the quadrilateral, *BCDE*, were equal to 72 or that all the angles in the triangle, *ABE*, were equal to 60. Some students simply did 72÷2 which does lead to the correct answer but is clearly an incorrect and incomplete method and gained no marks. Another common incorrect response which gained 1 mark was where students correctly the found the interior angle of a pentagon then incorrectly did 108÷2 =54.

Mark Scheme

Q1.

Question	Working	Answer	Mark	Notes
(a)		Pair of parallel lines	1	B1 for any pair of parallel lines marked.
(b)		Acute	1	B1 cao
(c)		Correct angle marked	1	B1 cao

Q2.

PAPER: 5MB2F_01					
Question		Working	Answer	Mark	Notes
	(a)		90	1	B1 cao
	(b)		*O* marked correctly	1	B1
	(c)		Correct arrows	1	B1

Q3.

PAPER: 5MB2F_01					
Question		Working	Answer	Mark	Notes
	(i)		obtuse	2	B1 cao
	(ii)		125		B1 accept 123 - 127

Q4.

Question		Working	Answer	Mark	Notes
	(i)		70	2	B1 for 70 look for answer on diagram
	(ii)		reason		C1 for angles (on a) straight line (add up to) 180°

Q5. (a) and (c) only)

Paper: 5MB2F_01					
Question		Working	Answer	Mark	Notes
	(a)		acute	1	B1 for acute
	(b)		line of symmetry drawn	1	B1 for single line of symmetry drawn
	(c)		80	1	B1 cao

Q6.

PAPER: 5MB2F_01					
Question		Working	Answer	Mark	Notes
			100	4	M1 identifying the triangle as isosceles or gives other base angle as 50° M1 for 180 – 50 – 50 (= 80) M1 for 360 – 90 – 90 – "80" A1 cao

Q7.

		Working	Answer	Mark	Notes
*		**(Method 1)** Angle *ACB* = 180 – 135 (= 45) (sum of angles on a straight line = 180) Angle *ABC* = 180 – 70 – 45 (=65) (sum of angles in a triangle = 180 (*x* =) 180 – 65 (=115) (sum of angles on a straight line = 180) OR **(Method 2)** Angle *ACB* = 180 – 135 (= 45) (sum of angles on a straight line = 180) (*x* =) 70 + 45 (=115) (exterior angle = sum of interior opposite angles) OR **(Method 3)** Angle DAB = 180 – 70 = 110 (sum of angles on a straight line = 180) (*x* =) 360 – 135 – 110 (sum of exterior angles of a polygon = 360)	*x* = 115	5	M1 for correct method to find angle *DAB* or angle *ACB* or angle *ABC* (may be implied by correct angle marked in diagram) M1 for complete correct method to find *x* A1 for *x* = 115 C2 (dep on M1) for fully correct reasons for chosen method no extras (C1 (dep on M1) for one correct reason for chosen method) [NB *x* = 115 must be stated explicitly, 115 only scores A0]

Q8.

PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
*		base angles of isosceles triangle are equal **and** angles on a straight line add up to 180° **and** angles in a triangle add up to 180° OR base angles of isosceles triangle are equal **and** angles in a triangle add up to 180° OR base angles of isosceles triangle are equal **and** exterior angle of a triangle is equal to the sum of the interior opposite angles	60° with reasons	4	B1 for angle $ADB = 25$ can be shown on the diagram M1 for a complete method to find x C2 (dep 2 previous marks) for 60 with full reasoning seen (C1 (dep 1 previous mark) for one reason) QWC: Reasons must be appropriate to the method shown.

Q9.

Paper: 5MB2F_01					
Question		Working	Answer	Mark	Notes
*			80	4	B1 for $EBF = 50$ or $ABE = 50$ M1 for angles given that can lead to $x = 80$ as the next step eg $EBF = 50$ and $ABE = 50$ eg $EBF = 50$ and $BFG = 100$ eg $EBF = 50$ and $BFE = 80$ eg $EBF = 50$ and $DEB = 130$ and $ABE = 50$ A1 cao C1 for stating correct reasons appropriate to their method shown eg Base angles of an isosceles triangle are equal. with Angles in a triangle add up to 180° with Alternate angles are equal eg Base angles of an isosceles triangle are equal. with Alternate angles are equal with Angles on a straight line add up to 180° eg Base angles of an isosceles triangle are equal. with The exterior angle of a triangle is equal to the sum of the opposite interior angles. with Allied angles / Co-interior angles add up to 180°

Q10.

Question		Working	Answer	Mark	Notes
*		Angle *ACB* = 35° (base angles of an isosceles triangle are equal) (angles in a triangle add up to 180) Angle *CAE* = 35° (alternate angles are equal) *x* = 360 – (100 + 90 + 35) = 135 (angles in a quadrilateral add up to 360°)	135	4	M1 for angle *ACB* = (180 – 110) ÷ 2 or 35 seen M1 for angle *CAE* = angle *ACB* or "35" (this could be marked on diagram) A1 *x* = 135 cao C1 (dep on M1) for alternate angles are equal or allied angles (co-interior angles) are supplementary (add to 180°) AND any one of • (base) or 2 angles of an isosceles triangle are equal oe • angles in a triangle (add up to) 180 • angles in a quadrilateral (add up to) 360° • angles in a pentagon (add up to) 540°

Q11.

Question	Working	Answer	Mark	AO	Notes
		18	P	3.1b	P1 for a process to start to solve problem, e.g. $8x + x = 180$ or $180 \div 9$ (=20)
			P	3.1b	P1 for a full process to solve problem, e.g. $360 \div$ '20'
			A	1.3b	A1 cao

Q12.

PAPER: 5MB3F_01					
Question		Working	Answer	Mark	Notes
			36	3	M1 for $3\times180 \div 5$ (=108) or $540 \div 5$ (=108) or for a correct calculation to find the exterior angle eg $360 \div 5$ or $180 - 360 \div 5$ (=108) M1 (dep) for "108" – 72 or 180 – "360 ÷ 5" – 72 or "360 ÷ 5" ÷ 2 A1 cao OR M1 for $x + x + (72 + x) = 180$ oe or $5(x + 72) = 540$ oe M1 for $(x =)\ (180 - 72) \div 3$ oe or $(x =)\ 540 \div 5 - 72$ oe A1 cao