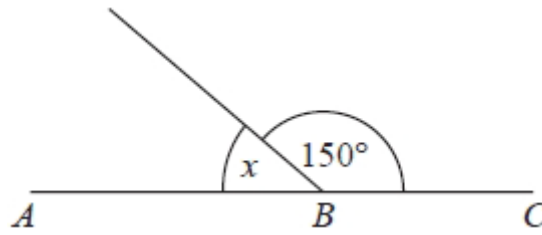


Questions

Q1.



ABC is a straight line.

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

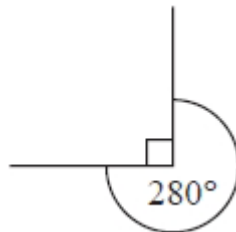
.....°
(1)

(ii) Give a reason for your answer.

.....
.....
.....

(1)

The diagram below is wrong.



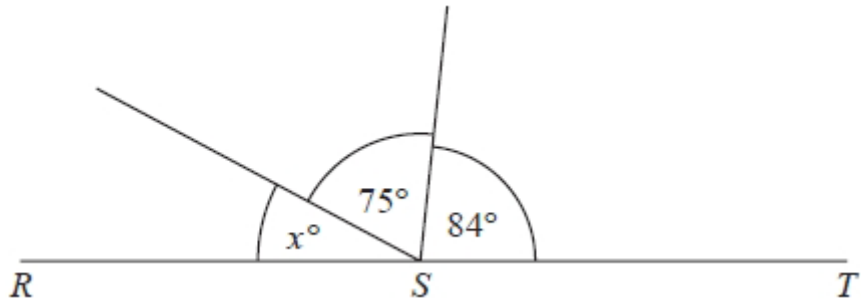
(b) Explain why.

.....
.....
.....

(1)

(Total for question = 3 marks)

Q2.



RST is a straight line.

(i) Work out the value of x .

.....
(2)

(ii) Give a reason for your answer.

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

(Total for question = 3 marks)

Q3.

Jenna measures all the angles around a point.

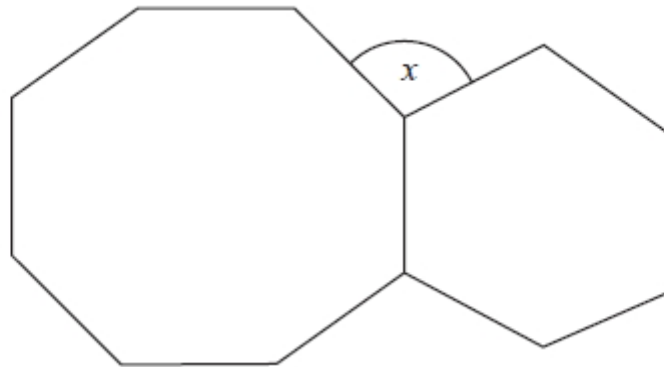
Her results are 23° , 145° , 23° and 69°

Explain why these results cannot be true.

.....
.....
.....

(Total for question = 1 mark)

Q4.



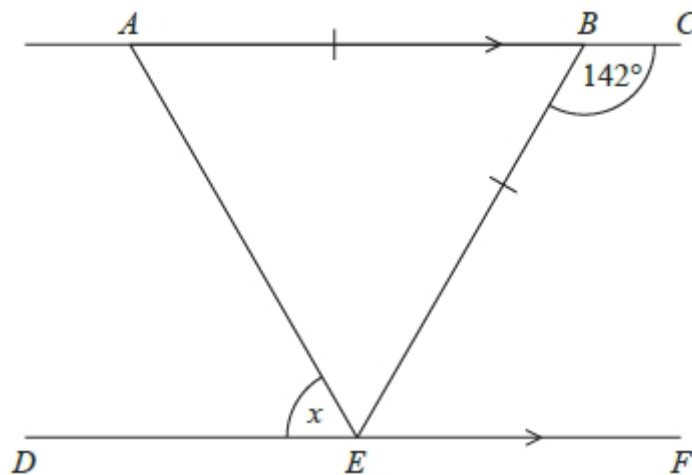
The diagram shows a regular octagon and a regular hexagon.

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

$x = \dots\dots\dots^\circ$

(Total for question = 3 marks)

Q5.



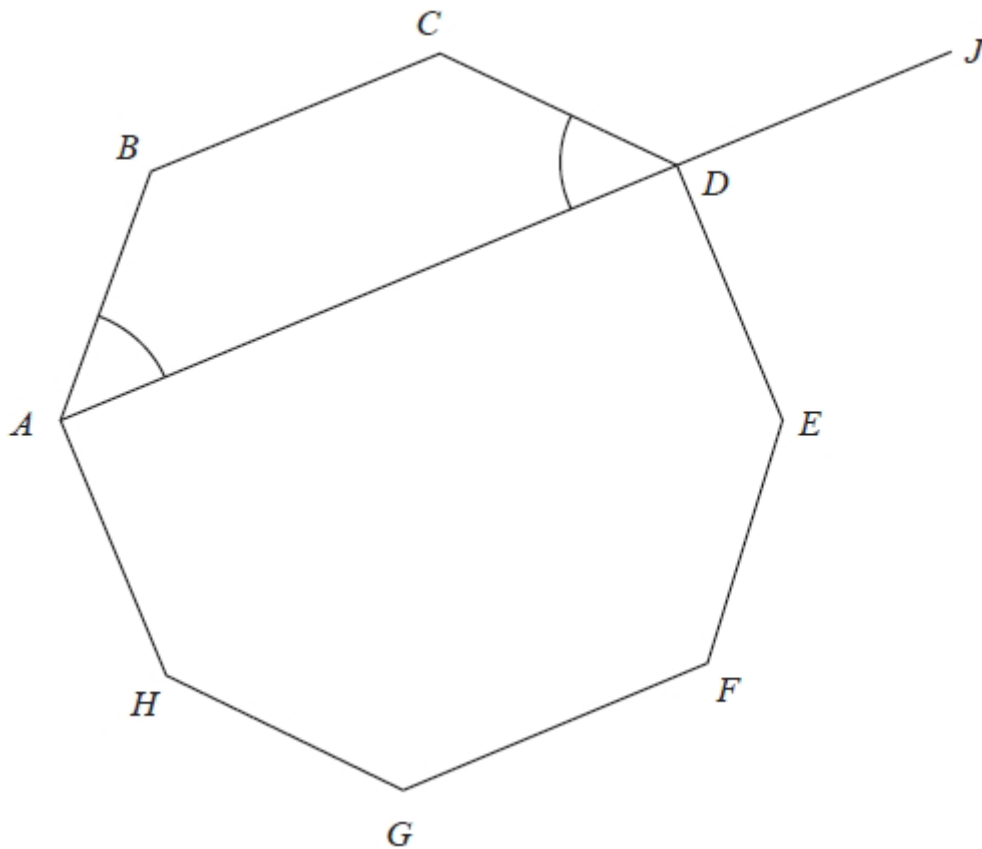
ABC and DEF are parallel straight lines.
 ABE is an isosceles triangle with $AB = BE$.
Angle $CBE = 142^\circ$

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

$\dots\dots\dots^\circ$

(Total for question = 5 marks)

Q6.



$ABCDEFGH$ is a regular octagon.
 ADJ is a straight line.

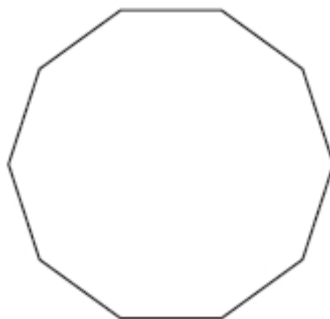
angle BAD = angle CDA

Show that angle $CDJ = 135^\circ$

Total for question = 4 marks)

Q7.

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.

.....^o

(1)

(Total for question = 2 marks)

Q8.

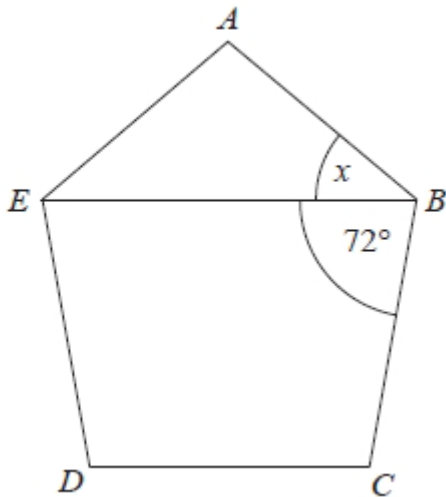


Diagram **NOT**
accurately drawn

ABCDE is a regular polygon.

EB is a straight line.

Angle *EBC* = 72° .

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

.....^o

(Total for question = 3 marks)

Examiner's Report

Q1.

Part (a)(i) was generally well answered with the vast majority of students gaining the mark. Unfortunately, the main error was that some students actually measured the angle and so lost the mark.

Part (a)(ii) was not so well answered with many students failing to give the correct reason. A list of the requirements for reasoning marks to be awarded has been communicated to centres. Students need to give an accurate statement which is not contradicted. In this particular case 'a straight line is 180' was seen but did not gain the mark as the 'angles' was omitted from the reason.

The vast majority of students gave a correct answer for part (b) of this question. Many were able to correctly compare the fact of 360 degrees around a point with the total of 370 degrees given in the incorrect diagram shown. Some did this by comparing 270° and 280° others compared 90° with 80° , all correct comparisons were acceptable.

Q2.

The majority of students scored both marks in part (i) calculating the angle to be 21 degrees. A small number of students used 360 in their calculation instead of 180 and this resulted in an incorrect answer of 201 degrees. The other error most often seen was arithmetic, again suggesting that students may have been reluctant to use their calculator for this question.

Part (ii) was less well answered. Students who did score the communication mark often wrote 'angles on a straight line add up to 180'. The mark was most commonly lost for missing out the word angles, other incorrect response included, 'half a circle is 180', here neither angle nor line were mentioned. However, the most common error was for students to state or re state their numerical calculation without mention of geometrical properties. Centres should encourage students to write short succinct explanations.

Q3.

Many students gained the mark here, usually by explaining that the angles did not add up to 360. There were some confused answers, with some students believing that the angles could not be duplicated (eg there cannot be 2 angles of 23) or not making a choice and suggesting that the angles sum might be 180 or 360.

Q8.

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 $72 \div 2$ 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 found the interior angle of a pentagon then incorrectly did $108 \div 2 = 54$.

Mark Scheme

Q1.

Question	Answer	Mark	Mark scheme	Additional guidance
(a)(i)	30	B1	cao	
(ii)	Reason	C1	reason, eg <u>angles</u> on a straight <u>line</u> add up to 180°	
(b)	Explanation	C1	for explanation eg the two angles don't add up to 360 Acceptable examples $90 + 280 = 370$ The two angles don't add up to 360 280 should be 270 Angles around a point equal 360° It should be 360 (in a circle) It should be 80 It should not be a right angle It cannot be 280° Not acceptable examples They don't add up to 180 365 degrees in a circle ┘ means 90 degrees	

Q2.

Question	Answer	Mark	Mark scheme	Additional guidance
(i)	21	M1 A1	for $180 - 75 - 84$ cao	Angle may be indicated on the diagram
(ii)	Reason given	C1	for reason that <u>Angles</u> on a straight <u>line</u> add up to 180	The key words underlined must be present There should be no incorrect reasons given

Q3.

Question	Answer	Mark	Mark scheme	Additional guidance
	Explanation	C1	<p>for explanation</p> <p>Acceptable examples They do not add to 360 They add to 100 too least It is missing a 100 angle / It needs 100 more Because the total has to be 360 A whole circle is 360</p> <p>Not acceptable examples They add up to 260 One of the angles is wrong A shape with 4 angles adds up to 360</p>	

Q4.

Question	Working	Answer	Notes
		105	<p>P1 for process to find the exterior angle or interior angle of a hexagon or octagon</p> <p>P1 for process to find the both exterior angles or both interior angles</p> <p>A1 for 105 from correct working</p>

Q5.

Question	Working	Answer	Mark	Notes
		71°	<p>M1</p> <p>M1</p> <p>A1</p> <p>C1</p> <p>C1</p>	<p>finds an angle using parallel lines, e.g. <i>BEF</i> as 38° or <i>EAB</i> as <i>x</i>.</p> <p>shows a complete process to arrive at the required angle could be evidenced by angles shown on the diagram</p> <p>cao</p> <p><u>alternate</u>, <u>corresponding</u> or <u>allied (co-interior)</u> unambiguously given <i>and</i> <u>appropriate for their working</u></p> <p>all other reasons given, e.g. <u>Angles on a straight line</u> add up to <u>180</u>, <u>Angles in a triangle</u> add up to <u>180</u>, <u>Base angles of an isosceles triangle</u> are <u>equal</u> <i>and</i> <u>appropriate for their working</u></p>

Q6.

Question	Working	Answer	Mark	Notes
		Correct conclusion from correct working	M1 A1 M1 C1	for a method to find the interior angle, e.g. $(8 - 2) \times 180 \div 8 (= 135)$ or exterior angle, e.g. $360 \div 8 (= 45)$ of a regular octagon for interior angle = 135 or exterior angle = 45 for method to find size of angle CDA , e.g. $(360 - 135 \times 2)/2 (= 45)$ or for stating and using BC parallel to AD for method to complete the solution with angle $CDJ = 135$ e.g. $180 - "45" (= 135)$ or angle BCD and angle CDJ are alternate angles

Q7.

5MB3F_01 November 2015				
Question	Working	Answer	Mark	Notes
(a)		decagon	1	B1 cao
(b)		1440	1	B1 cao

Q8.

PAPER: 5MB3F_01				
Question	Working	Answer	Mark	Notes
		36	3	M1 for $3 \times 180 \div 5 (=108)$ 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 $180 - "360 \div 5" - 72$ or " $360 \div 5" \div 2$ 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