

Q1. The diagram shows 3 sides of a regular polygon.

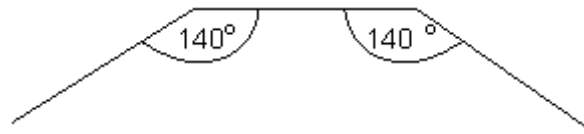


Diagram **NOT** accurately drawn

Each interior angle of the regular polygon is 140° .

Work out the number of sides of the regular polygon.

.....

(Total 3 marks)

Q2. The interior angle of a regular polygon is 160° .



Diagram **NOT** accurately drawn

(i) Write down the size of an exterior angle of the polygon.

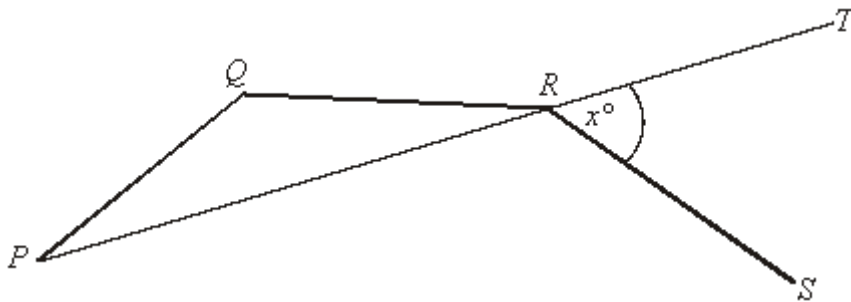
.....^o

(ii) Work out the number of sides of the polygon.

.....
(Total 3 marks)

Q3.

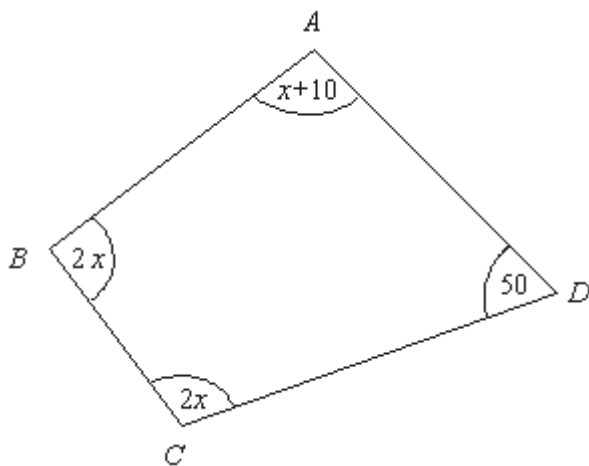
Diagram **NOT**
accurately drawn



PQ, *QR* and *RS* are 3 sides of a regular decagon.
PRT is a straight line.
Angle *TRS* = x°

Work out the value of x

$x = \dots\dots\dots$

(Total 5 marks)**Q4.**Diagram **NOT** accurately drawn

In this quadrilateral, the sizes of the angles, in degrees, are

$$x + 10$$

$$2x$$

$$2x$$

$$50$$

- (a) Use this information to write down an equation in terms of x .

.....

(2)

- (b) Work out the value of x .

$$x = \dots\dots\dots$$

(3)

(Total 5 marks)

Q5.



Diagram **NOT** accurately drawn

The diagram shows part of a **regular** 10-sided polygon.

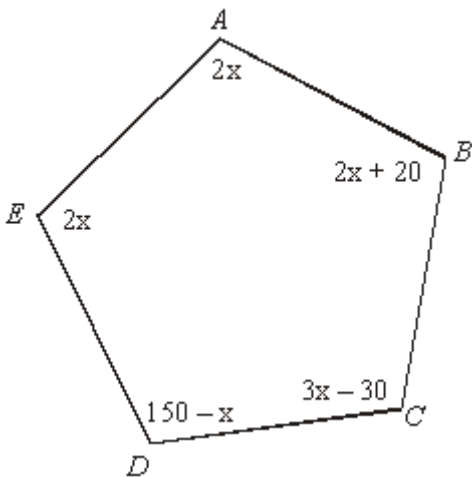
Work out the size of the angle marked x .

.....°

(Total 3 marks)

- Q6.** In the diagram all of the angles are in degrees.
Find the size of angle CDE .

Diagram **NOT** accurately drawn



.....

(Total 4 marks)

M1.

Working	Answer	Mark	Additional Guidance
180 – 140 (= 40) 360 ÷ “40”	9	3	M1 for 180 – 140 (= 40) M1 (dep) for 360 ÷ “40” A1 cao
Total for Question: 3 marks			

M2.

	Working	Answer	Mark	Additional Guidance
(i)	180° – 160°	20	1	B1 cao
(ii)	Exterior angles sum to 360° So 360 ÷ ‘20’ =	18	2	M1 for 360 ÷ “20” A1 cao
Total for Question: 3 marks				

M3.

Working	Answer	Mark	Additional Guidance
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Angle PQR = angle QRS =

$$\frac{(10 - 2) \times 180}{100} = 144^\circ$$

(interior angle of an nsided polygon)

Angle QPR = angle QRP =

$$\frac{180 - 144}{2}$$

= 18° (base angles of isos triangle)

Angle PRS = $144 - 18 = 126^\circ$

$$x = 180 - 126 = 54^\circ$$

(angles on a straight line)

54°

5

Total for Question: 5 marks

M4.

	Working	Answer	Mark	Additional Guidance
(a)	$2x + 2x + x + 10 + 50 = 360$	$5x + 60 = 360$	2	M1 3 or 4 out of $2x$, $2x$, $x + 10$, 50 added together A1 $2x + 2x + x + 10 + 50 = 360$ oe including $x = 60$
(b)	$5x + 60 = 360$ $5x = 300$	60	3	M1 for isolating their terms in x M1 for dividing their numerical term by the coefficient of their x term A1 cao All the marks in (b) may be given for work done in answering (a) providing there is no contradiction Candidates can score full marks in (b) independent of their answer in (a) (e. g. by starting again)
Total for Question: 5 marks				

M5.

Working	Answer	Mark	Additional Guidance
$360 \div 10 = 36$ $180 - 36$ $180 \times (10 - 2) \div 10$	144	3	M1 for $360 \div 10$ or 36 seen M1 (dep) for $180 - "36"$ A1 cao OR M1 for $180 \times (10 - 2)$ oe or 1440 seen M1 (dep) for $"1440" \div 10$

			A1 cao
Total for Question: 3 marks			

M6.

Working	Answer	Mark	Additional Guidance
$2x + 2x + 40 + 3x - 30 + 150 - x + 2x = 540$ $8x + 140 = 540$ $x = 50$	100°	4	M1 $2x + 2x + 40 + 3x - 30 + 150 - x + 2x$ M1 collects terms correctly A1 $x = 50$ A1 cao
Total for Question: 4 marks			

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Where candidates calculated the correct exterior angle, the correct answer usually followed although $360 \div 40 = 8$ was quite common. Some candidates added that the shape was a nonagon. Many candidates chose the less efficient and more error prone strategy of listing multiples of 140 to compare with a list of the multiples of 180. Some did not appreciate that only part of a regular polygon was shown and instead drew horizontal and/or vertical lines to close the shape and form a trapezium or hexagon.

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Many candidates calculated the external angle of the polygon correctly but some then divided 180 (instead of 360) by 20 to get 9. The most common incorrect answer for (a) was 200 where candidates calculated the reflex angle instead of the exterior angle. These candidates often started again to get $360 \div 20$ and the correct answer of 18. Some candidates scored 1 mark overall, generally for writing 40° in part (i) and then 9 in part (ii) where a follow through method mark could be awarded.

E4. This was a linked question in which in part (a) candidates had to derive an equation and then solve the equation in part (b). Many candidates did in fact produce the equation $5x + 60 = 360$ as their answer. These candidates usually went on to solve the equation correctly. A few candidates did simplify the expression $x + 2x + 2x + 10 + 50$ as $4x^2 + 60$

Of those candidates who could not do part (a), a sizable number were still able to find the value of x in part (b) by judicious use of the calculator. They earned the marks available for part (b). Many candidates put down an incomplete answer to part (a) by just writing the expression $5x + 60$. Many of them went on to find the value of x as 60 in part (b) but sadly a minority then made up and solved the equation $5x + 60 = 0$

E5. This question was not in general well done, many candidates merely divided 360 by 10 giving 36 as their answer for x . Realising that finding the sum of the interior angles was required, many simply found the sum of the interior angles of a pentagon (540°) and then doubled their answer for a 10-sided polygon. A significant number of candidates attempted to find the sum by repeated addition of 180; this often resulted in an incorrect answer through arithmetic errors being made.

