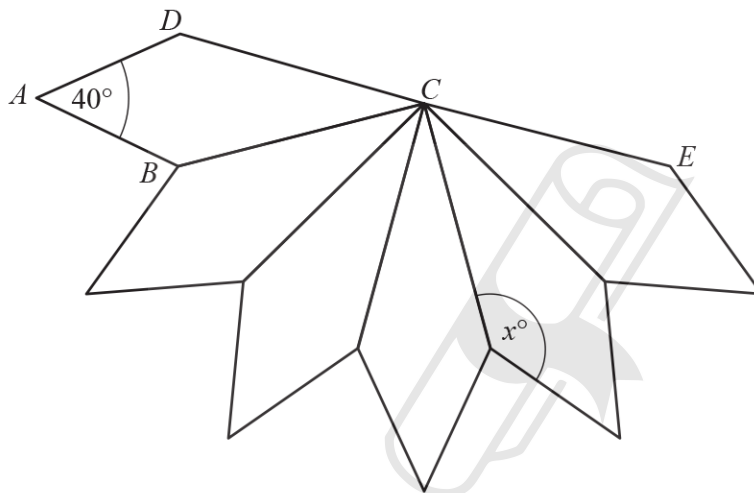


Chapter 4

Geometry

01. 0580_s24_qp_21 Q: 6



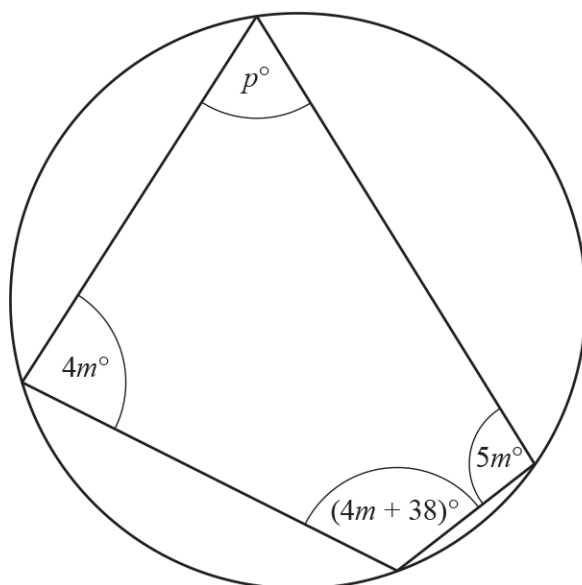
NOT TO
SCALE

The diagram shows 5 kites that are congruent to kite $ABCD$.
Each kite is joined to the next kite along one edge.
Angle $DAB = 40^\circ$ and DCE is a straight line.

Find the value of x .

$x = \dots\dots\dots$ [3]

02. 0580_s24_qp_21 Q: 13

NOT TO
SCALE

The diagram shows a cyclic quadrilateral.

Find the value of p .



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 $p = \dots\dots\dots [3]$

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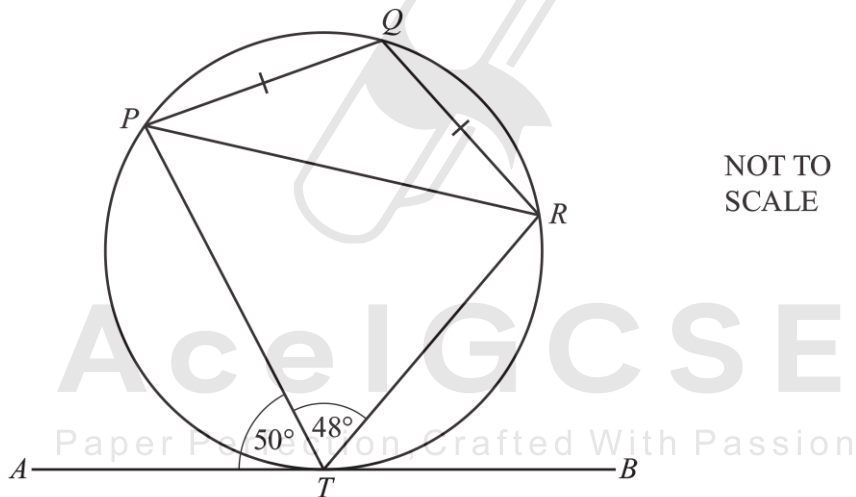
03. 0580_s24_qp_22 Q: 20

Two parcels are mathematically similar.
The larger parcel has volume 80 cm^3 and height 5.2 cm .
The smaller parcel has volume 33.75 cm^3 .

Calculate the height of the smaller parcel.

..... cm [3]

04. 0580_s24_qp_23 Q: 14



P, Q, R and T are points on the circle.
 AB is a tangent to the circle at T .
Angle $ATP = 50^\circ$, angle $PTR = 48^\circ$ and $PQ = QR$.

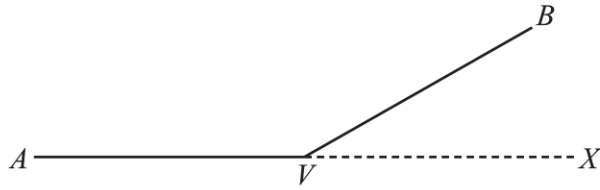
(a) Find angle PRT .

Angle $PRT = \dots\dots\dots$ [1]

(b) Find angle QPR .

Angle $QPR = \dots\dots\dots$ [2]

05. 0580_s24_qp_23 Q: 18



NOT TO
SCALE

The diagram shows two sides, VA and VB , of a regular polygon.
 AVX is a straight line.
 Angle $BVX = y^\circ$ and angle $AVB = 11.5y^\circ$.

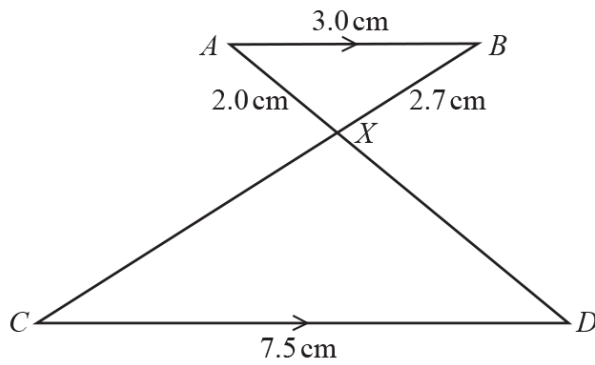
Find the number of sides of this polygon.



..... [3]

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06. 0580_m23_qp_22 Q: 10



NOT TO
SCALE

In the diagram, AB and CD are parallel.
The lines CB and AD intersect at X .
 $AB = 3.0$ cm, $AX = 2.0$ cm, $BX = 2.7$ cm and $CD = 7.5$ cm.

Find the length of BC .



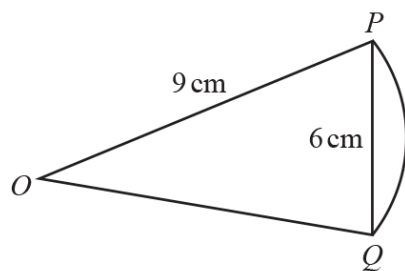
$BC = \dots\dots\dots$ cm [3]

07. 0580_m23_qp_22 Q: 12

In a regular polygon, the interior angle and the exterior angle are in the ratio interior : exterior = 11 : 1.
Find the number of sides of this regular polygon.

$\dots\dots\dots$ [3]

08. 0580_m23_qp_22 Q: 14

NOT TO
SCALE

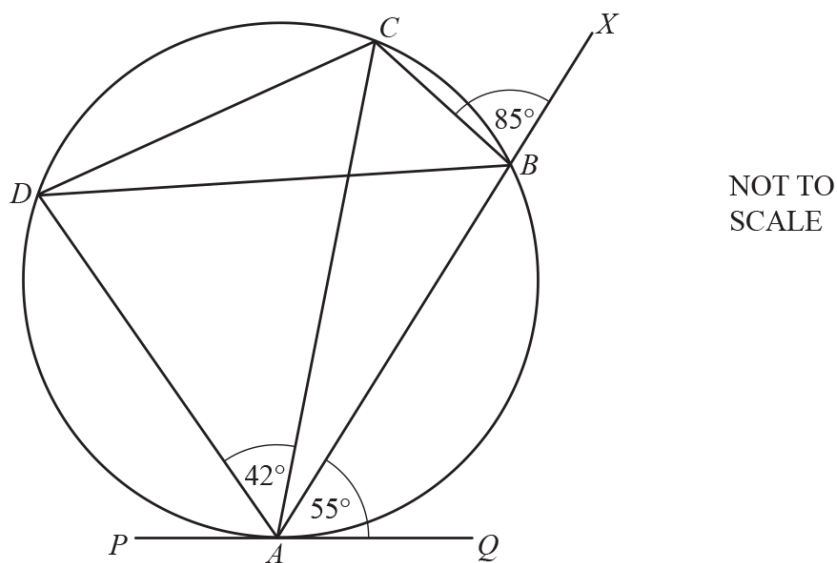
The diagram shows a sector of a circle with centre O and radius 9 cm .
The length of the chord PQ is 6 cm .

Calculate the length of the arc PQ .



..... cm [3]

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$ABCD$ is a cyclic quadrilateral, ABX is a straight line and PQ is a tangent to the circle at A .
 Angle $CBX = 85^\circ$, angle $BAQ = 55^\circ$ and angle $CAD = 42^\circ$.

Find

(a) angle CBD

Angle $CBD = \dots\dots\dots$ [1]

(b) angle ACB

Angle $ACB = \dots\dots\dots$ [1]

(c) angle ADC

Angle $ADC = \dots\dots\dots$ [1]

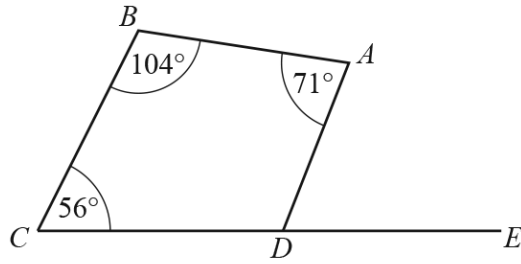
(d) angle BCD

Angle $BCD = \dots\dots\dots$ [2]

(e) angle PAD .

Angle $PAD = \dots\dots\dots$ [1]

10. 0580_s23_qp_21 Q: 1



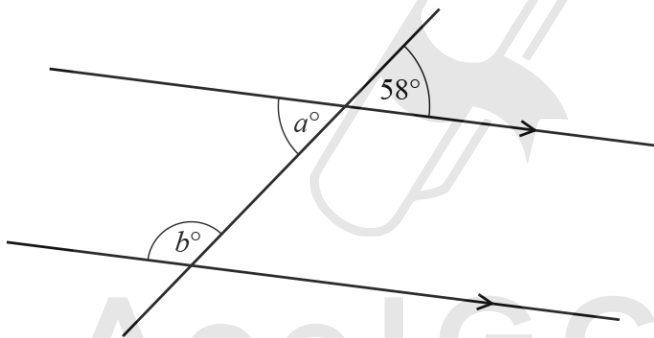
NOT TO SCALE

CDE is a straight line.

Find angle ADE .

..... [2]

11. 0580_s23_qp_21 Q: 3



NOT TO SCALE

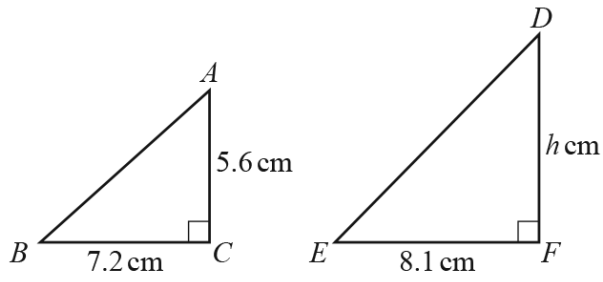
The diagram shows a straight line intersecting two parallel lines.

Find the value of a and the value of b , giving a geometrical reason for each answer.

$a =$ because

$b =$ because [4]

12. 0580_s23_qp_21 Q: 9



NOT TO
SCALE

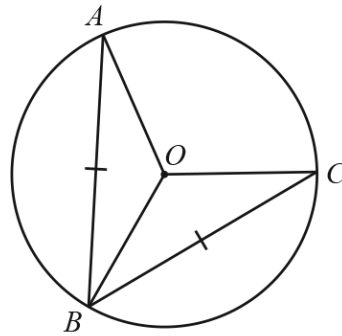
Triangle ABC is similar to triangle DEF .

Calculate the value of h .

$h = \dots\dots\dots$ [2]

13. 0580_s23_qp_21 Q: 12

(a)



NOT TO SCALE

AO , OB and OC are all radii of the circle.

$AB = BC$.

Therefore triangle AOB is congruent to triangle COB .

Draw a ring around the correct criterion for this statement.

SAS

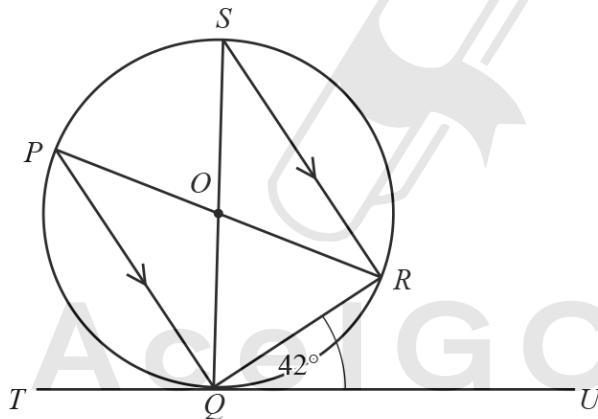
RHS

SSS

ASA

[1]

(b)



NOT TO SCALE

P , Q , R and S are points on the circle and TQU is a tangent to the circle at Q .

PR and SQ intersect at the centre of the circle, O , and PQ is parallel to SR .

Angle $RQU = 42^\circ$.

Calculate

(i) angle QSR

Angle $QSR = \dots\dots\dots$ [1]

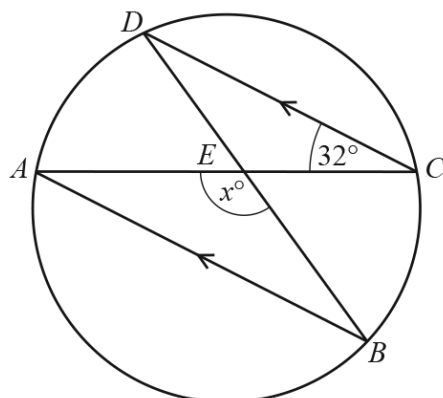
(ii) angle PQS

Angle $PQS = \dots\dots\dots$ [1]

(iii) angle POS .

Angle $POS = \dots\dots\dots$ [1]

14. 0580_s23_qp_22 Q: 13



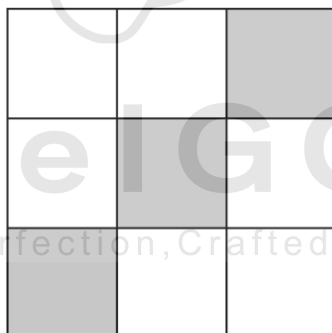
NOT TO SCALE

A, B, C and D are points on a circle.
 AB is parallel to DC and angle $ACD = 32^\circ$.
 Chords AC and DB intersect at E .

Find the value of x .

$x = \dots\dots\dots$ [2]

15. 0580_s23_qp_23 Q: 1



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(a) Complete the statement.

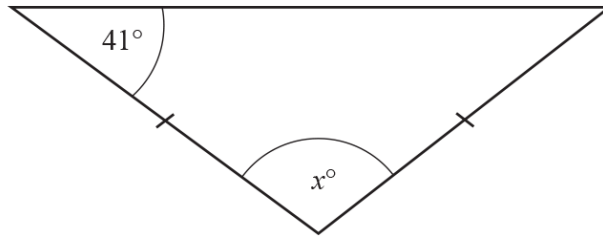
The diagram has rotational symmetry of order [1]

(b) On the diagram, draw all the lines of symmetry.

[2]

16. 0580_w23_qp_21 Q: 1

The diagram shows an isosceles triangle.

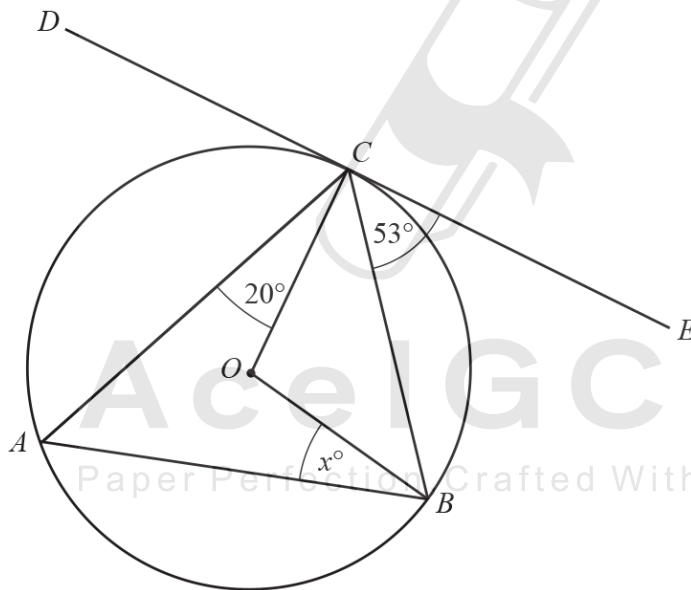


NOT TO SCALE

Find the value of x .

$x = \dots\dots\dots$ [2]

17. 0580_w23_qp_21 Q: 17



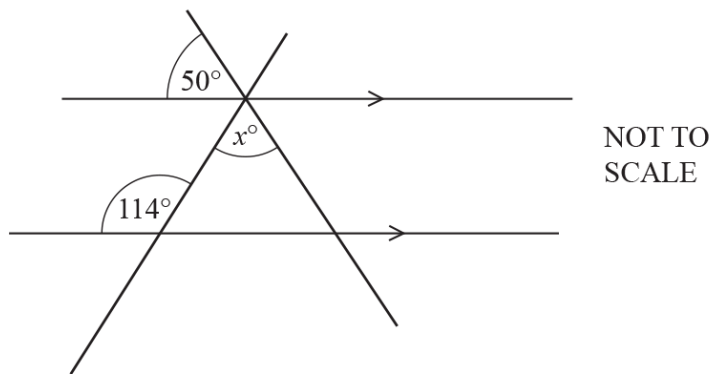
NOT TO SCALE

A, B and C are points on the circumference of a circle, centre O .
Tangent DE touches the circle at C .
Angle $BCE = 53^\circ$ and angle $ACO = 20^\circ$.

Find the value of x .

$x = \dots\dots\dots$ [3]

18. 0580_w23_qp_22 Q: 5

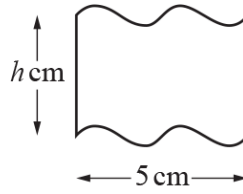
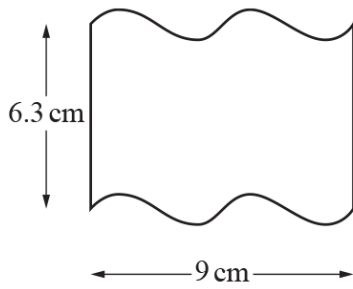


The diagram shows two intersecting straight lines crossing two parallel lines.

Find the value of x .

$x = \dots\dots\dots$ [2]

19. 0580_w23_qp_22 Q: 11



NOT TO SCALE

The two shapes are mathematically similar.

(a) Find the value of h .

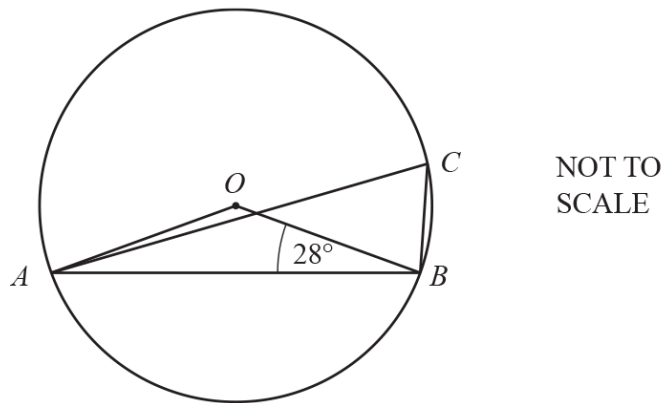
$h = \dots\dots\dots$ [2]

(b) The area of the smaller shape is 16 cm^2 .

Calculate the area of the larger shape.

$\dots\dots\dots \text{ cm}^2$ [2]

(a)

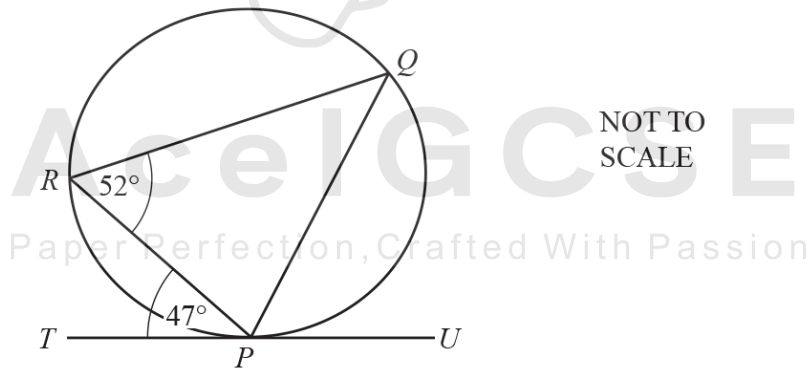


A, B and C are points on a circle, centre O .
 Angle $OBA = 28^\circ$.

Find angle ACB .

Angle $ACB = \dots\dots\dots$ [2]

(b)

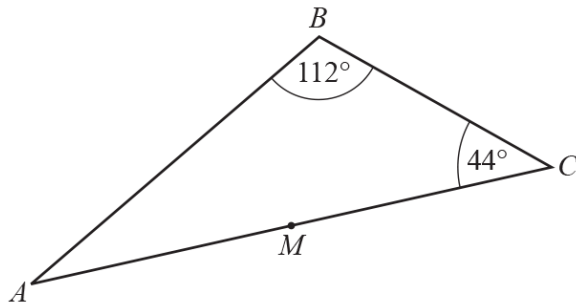


P, Q and R are points on a circle.
 TU is a tangent to the circle at P .
 Angle $TPR = 47^\circ$ and angle $PRQ = 52^\circ$.

Find angle RPQ .

Angle $RPQ = \dots\dots\dots$ [2]

21. 0580_w23_qp_23 Q: 5



NOT TO SCALE

The diagram shows triangle ABC .
 M is the midpoint of AC .

Triangle ABC is rotated 180° about centre M .
 The image and the original triangle together form a quadrilateral $ABCD$.

(a) Write down the mathematical name of the quadrilateral $ABCD$.

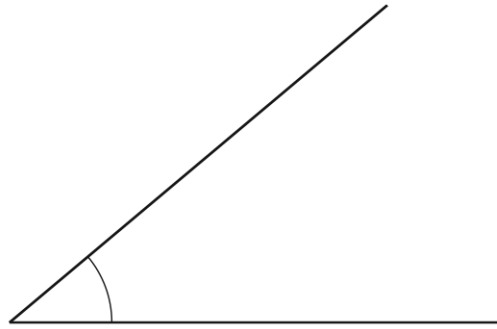
..... [1]

(b) Find angle BAD .

Angle $BAD =$ [2]

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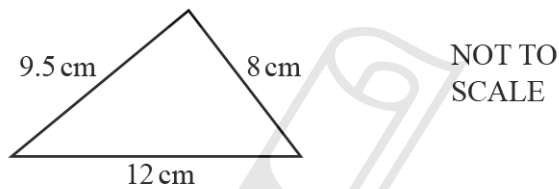
22. 0580_m22_qp_22 Q: 1



Measure the marked angle.

..... [1]

23. 0580_m22_qp_22 Q: 6

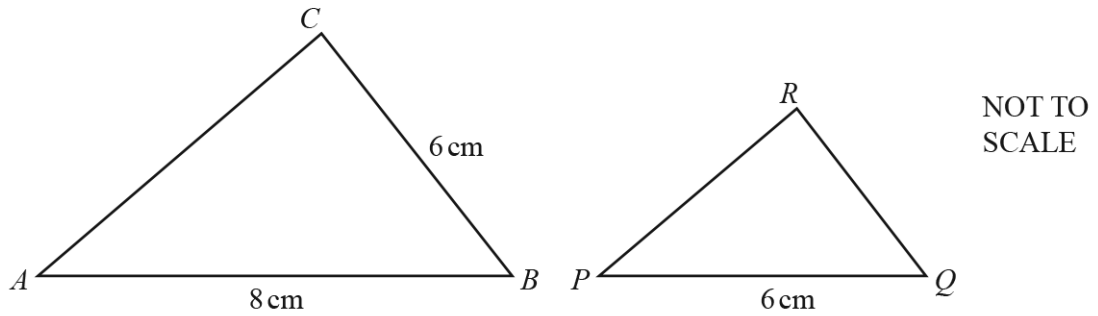


Using a ruler and compasses only, construct this triangle.
Leave in your construction arcs.
The side of length 12 cm has been drawn for you.

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[2]

24. 0580_s22_qp_21 Q: 11



Triangle ABC is mathematically similar to triangle PQR .

(a) Calculate QR .

$QR = \dots\dots\dots$ cm [2]

(b) The two triangles are the cross-sections of two mathematically similar prisms. The volume of the larger prism is 320 cm^3 .

Calculate the volume of the smaller prism.

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Paper Perfection, Crafted With Passion $\dots\dots\dots \text{ cm}^3$ [2]

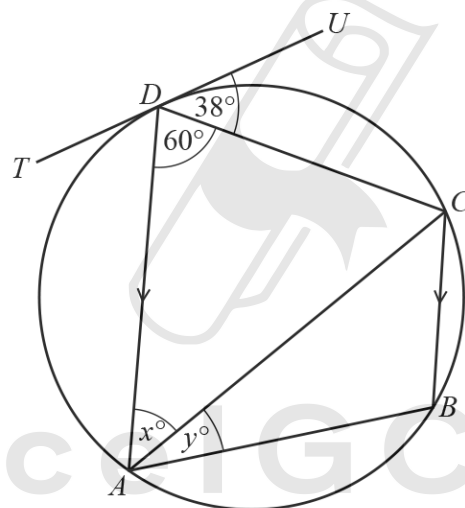
25. 0580_s22_qp_21 Q: 12

The interior angles of a pentagon are in the ratio $4 : 5 : 5 : 7 : 9$.

Find the size of the largest angle.

..... [3]

26. 0580_s22_qp_21 Q: 18



NOT TO SCALE

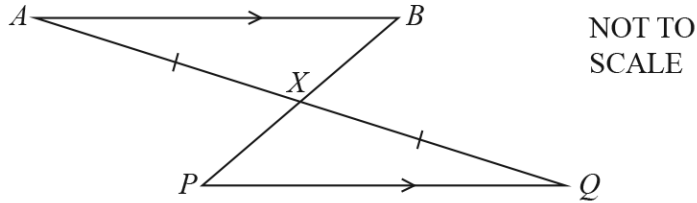
A, B, C and D are points on a circle.
 TU is a tangent to the circle at D .
 DA is parallel to CB .

Find the value of x and the value of y .

$x =$

$y =$ [3]

27. 0580_s22_qp_21 Q: 19



In the diagram, AB is parallel to PQ .
 AQ and PB intersect at X with $AX = XQ$.

Complete the following statements.

In triangles ABX and QPX ,

$AX = XQ$ is given information.

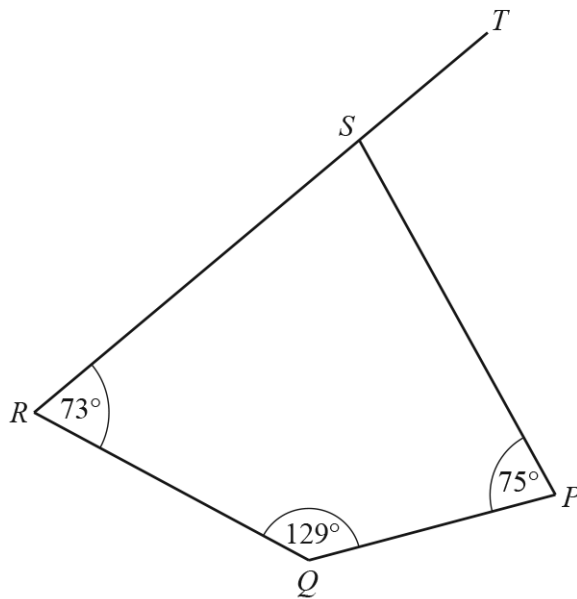
Angle $BAX =$ Angle because

Angle $AXB =$ Angle because

Triangle ABX is congruent to triangle QPX because of the congruency criterion

$PX =$ because the triangles are congruent. [4]

28. 0580_s22_qp_23 Q: 3



NOT TO
SCALE

$PQRS$ is a quadrilateral.
 RST is a straight line.

Find angle PST .

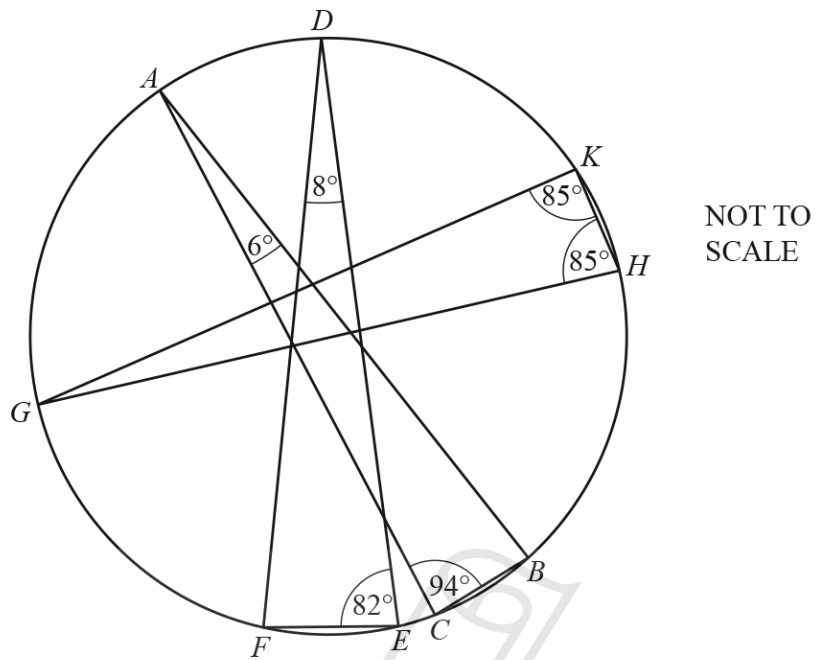


Angle PST = [2]

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29. 0580_s22_qp_23 Q: 11

ABC , DEF and GHK are triangles with all vertices on the circumference of a circle.



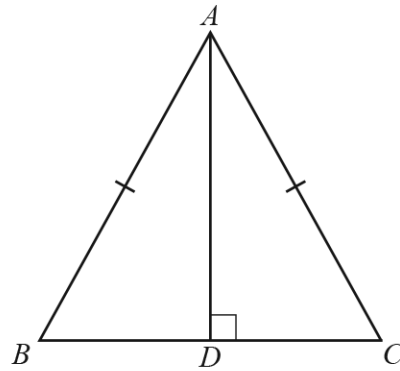
From the list, draw a ring around the line that is a diameter of the circle.

AB AC DE DF GH GK

[1]

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30. 0580_s22_qp_23 Q: 17



NOT TO SCALE

In triangle ABC , $AC = AB$.
 D is the point on BC such that AD is perpendicular to BC .

Complete the following statements to show that triangle ACD and triangle ABD are congruent.

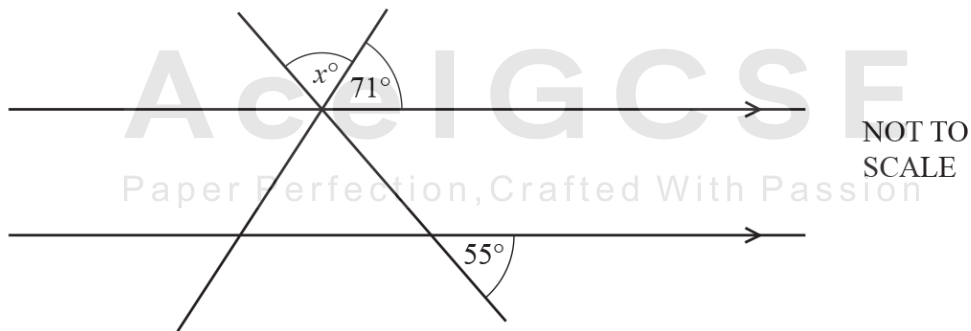
AD is perpendicular to BC so that Angle = Angle = $^{\circ}$

$AC = AB$ is given information.

Side is common to both triangles.

Triangle ACD is congruent to triangle ABD because of the congruency criterion [3]

31. 0580_w22_qp_21 Q: 5



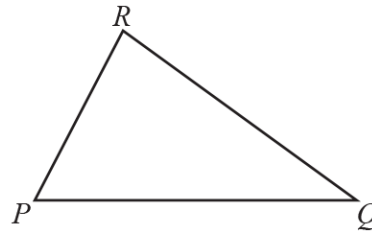
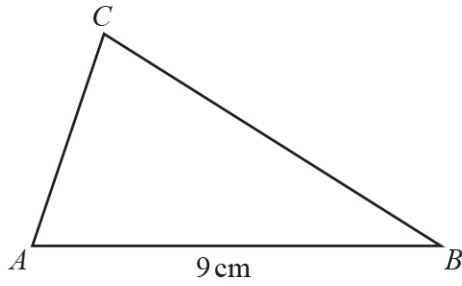
NOT TO SCALE

The diagram shows two straight lines intersecting two parallel lines.

Find the value of x .

$x =$ [2]

32. 0580_w22_qp_21 Q: 12



NOT TO SCALE

Triangle PQR is similar to triangle ABC with $\frac{PR}{AC} = \frac{2}{3}$.

$AB = 9\text{ cm}$ and the area of triangle ABC is 18 cm^2 .

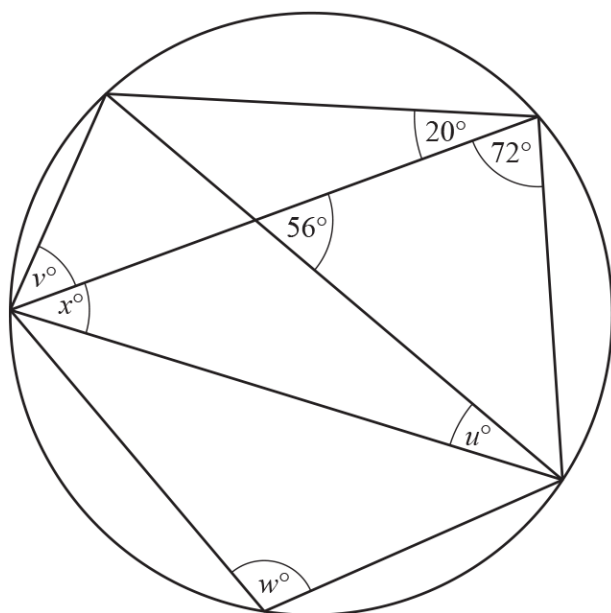
(a) Find the length of PQ .

..... cm [1]

(b) Find the area of triangle PQR .

..... cm^2 [2]

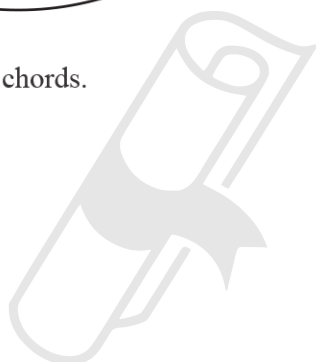




NOT TO
SCALE

The diagram shows a circle and eight chords.

Calculate the values of u , v , w and x .



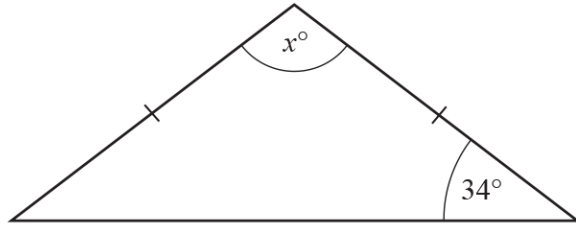
Ace | GCSE $u =$

Paper Perfection, Crafted With Passion $v =$

$w =$

$x =$ [4]

34. 0580_w22_qp_22 Q: 1



NOT TO SCALE

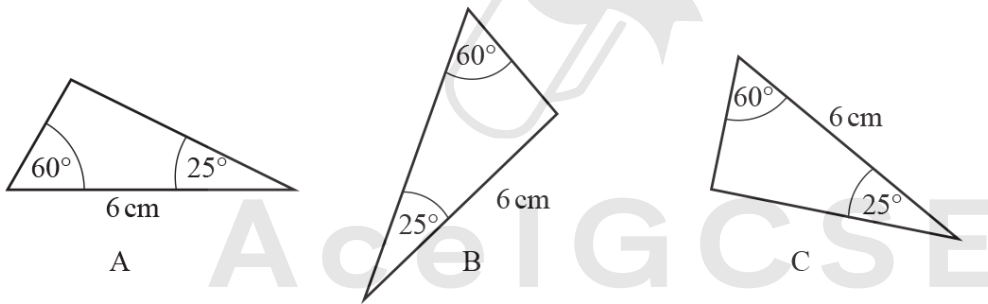
The diagram shows an isosceles triangle.

Find the value of x .

$x = \dots\dots\dots$ [2]

35. 0580_w22_qp_22 Q: 9

The diagram shows three triangles A, B and C.



NOT TO SCALE

(a) Which two of the triangles A, B and C are congruent with each other?

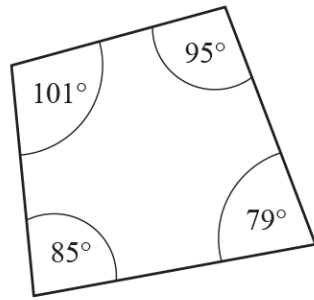
$\dots\dots\dots$ [1]

(b) Draw a ring around the congruence criterion that can be used to support your answer to **part (a)**.

SSS ASA SAS RHS

[1]

36. 0580_w22_qp_22 Q: 15



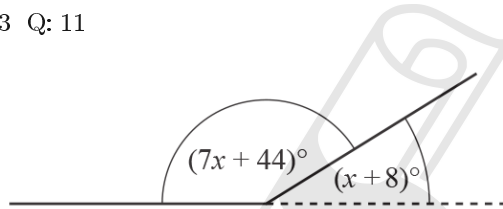
NOT TO
SCALE

The diagram shows a quadrilateral.

Give a geometrical reason why this is a cyclic quadrilateral.

..... [1]

37. 0580_w22_qp_23 Q: 11



NOT TO
SCALE

The diagram shows two sides of a regular polygon.

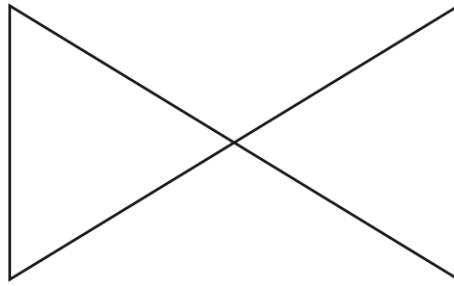
The interior angle of the polygon is $(7x + 44)^\circ$ and the exterior angle is $(x + 8)^\circ$.

Find the number of sides of this polygon.

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..... [4]

38. 0580_m21_qp_22 Q: 1

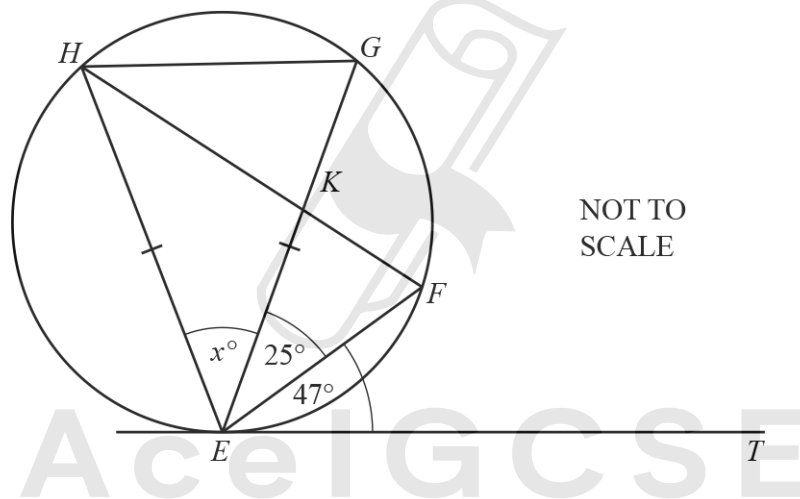


(a) Complete this statement.

The diagram has rotational symmetry of order [1]

(b) On the diagram, draw all the lines of symmetry. [2]

39. 0580_m21_qp_22 Q: 15



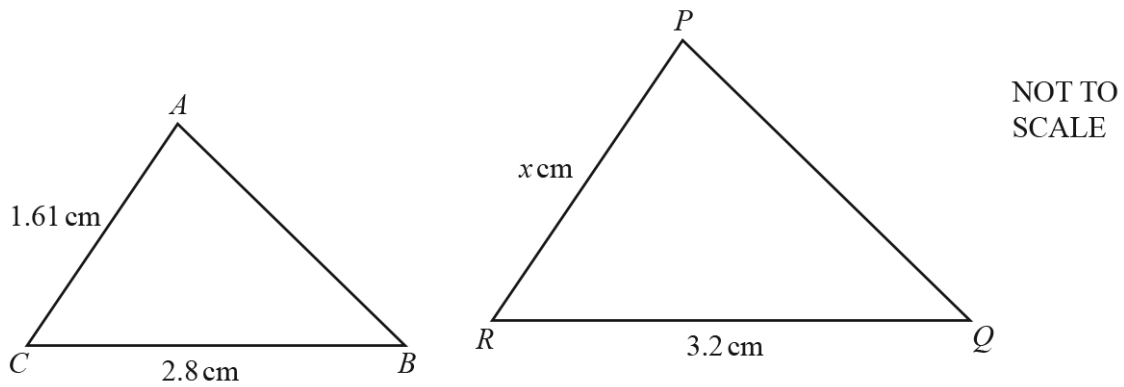
NOT TO SCALE

Points E, F, G and H lie on the circle and $EG = EH$.
 HF and EG intersect at K .
 ET is a tangent to the circle at E .
 Angle $FET = 47^\circ$ and angle $FEG = 25^\circ$.

Find the value of x .

$x = \dots\dots\dots$ [2]

(a)



Triangle ABC is mathematically similar to triangle PQR .

Find the value of x .

(b)

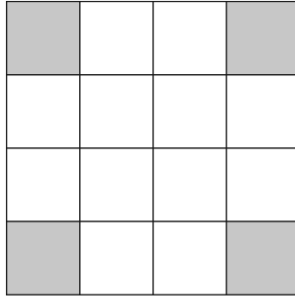


The diagram shows two mathematically similar bowls.
The larger bowl has capacity 7.8 litres and height 11.5 cm.
The smaller bowl has capacity 4 litres.

Calculate the height of the smaller bowl.

..... cm [3]

41. 0580_s21_qp_21 Q: 1



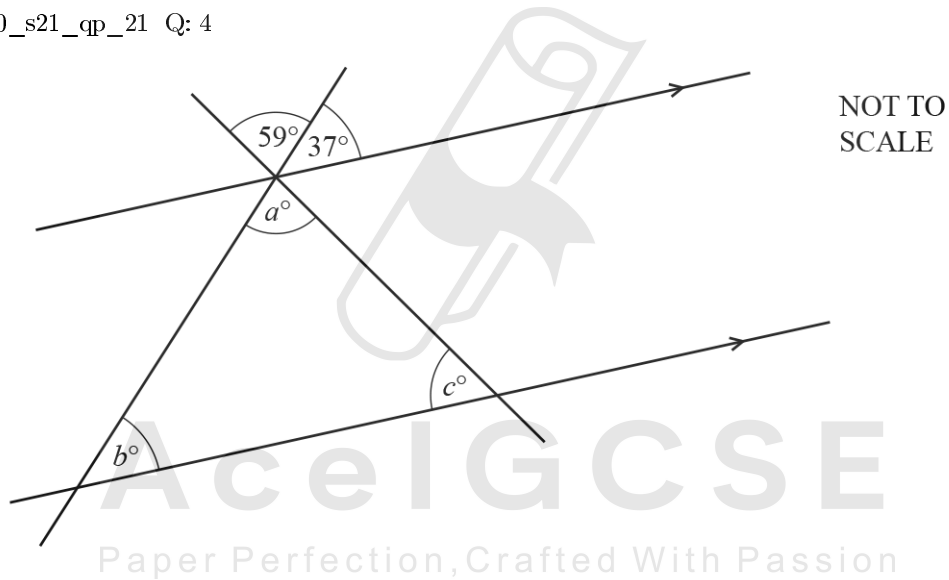
(a) Write down the order of rotational symmetry of this diagram.

..... [1]

(b) On the diagram, draw all the lines of symmetry.

[2]

42. 0580_s21_qp_21 Q: 4



The diagram shows two parallel lines intersected by two straight lines.

Find the values of a , b and c .

$a =$

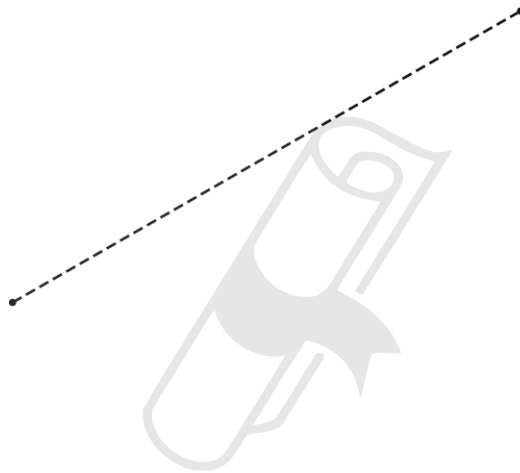
$b =$

$c =$ [3]

43. 0580_s21_qp_22 Q: 6

A rhombus has side length 6.5 cm.
The rhombus can be constructed by drawing two triangles.

Using a ruler and compasses only, construct the rhombus.
Leave in your construction arcs.
One diagonal of the rhombus has been drawn for you.

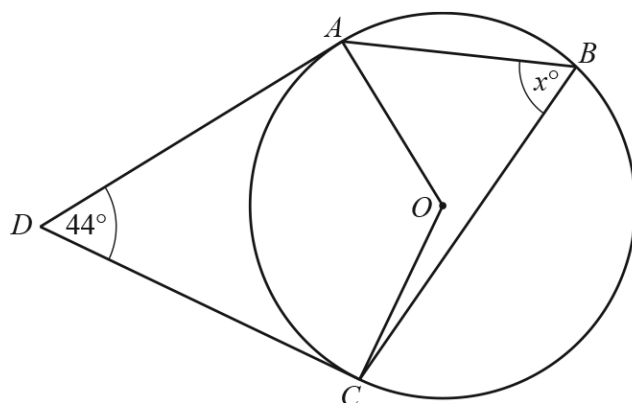


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[2]

44. 0580_s21_qp_22 Q: 13



NOT TO
SCALE

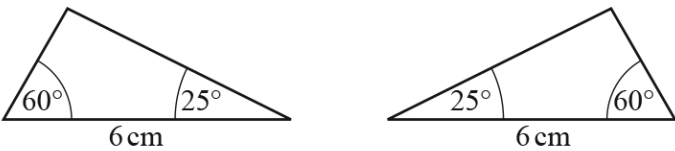
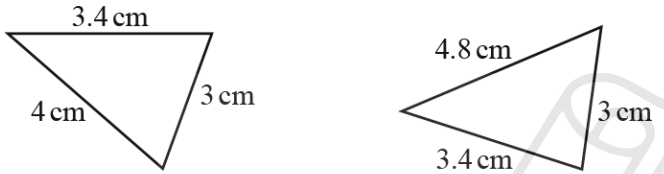
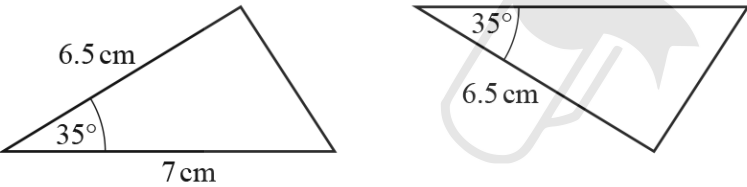

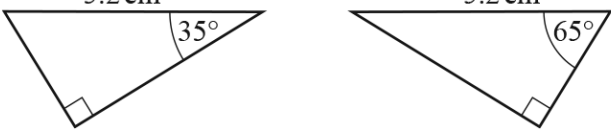
A , B and C are points on a circle, centre O .
 DA and DC are tangents.
 Angle $ADC = 44^\circ$.

Work out the value of x .



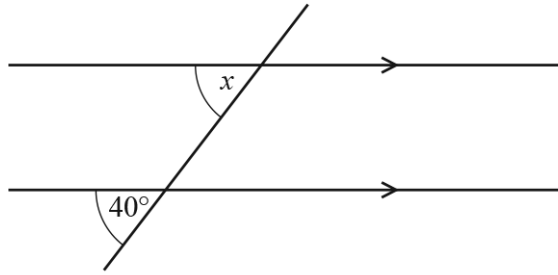
$x = \dots\dots\dots$ [3]

Complete the table showing information about the congruence of pairs of triangles.
 The first two rows have been completed for you.
 All diagrams are not to scale.

Pair of triangles	Congruent or not congruent	Congruence criterion
	Congruent	ASA
	Not congruent	None
		
		
		

[3]

46. 0580_s21_qp_23 Q: 3



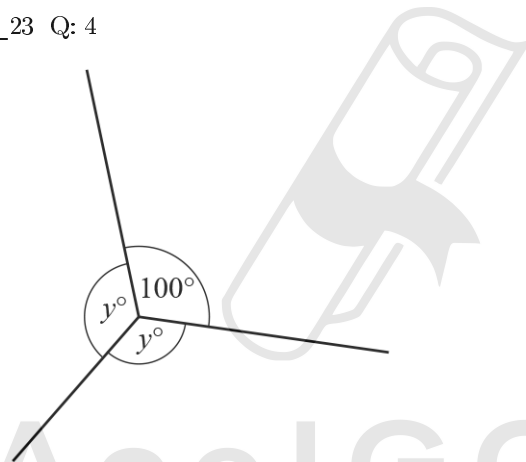
NOT TO
SCALE

The diagram shows a pair of parallel lines and a straight line.

Complete the statement with the correct geometrical reason.

$x = 40^\circ$ because the angles are [1]

47. 0580_s21_qp_23 Q: 4

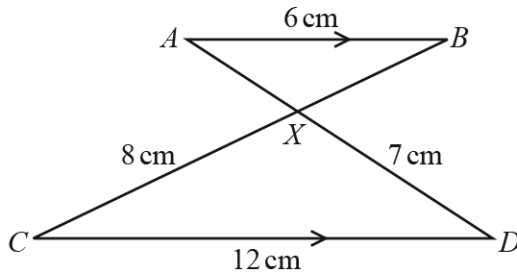


NOT TO
SCALE

Find the value of y .

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$y =$ [2]



NOT TO SCALE

In the diagram, AB is parallel to CD .
 AD and BC intersect at X .
 $AB = 6$ cm, $CD = 12$ cm, $CX = 8$ cm and $DX = 7$ cm.

(a) Complete the statement.

Triangle ABX is to triangle DCX . [1]

(b) Work out the length of BX .

$BX = \dots\dots\dots$ cm [2]

(c) The area of triangle DCX is 26.906 cm².

Use this value to find the area of

(i) triangle ABX ,

$\dots\dots\dots$ cm² [2]

(ii) triangle ACX .

$\dots\dots\dots$ cm² [1]

49. 0580_s21_qp_23 Q: 17

The interior angle of a regular polygon is 175° .

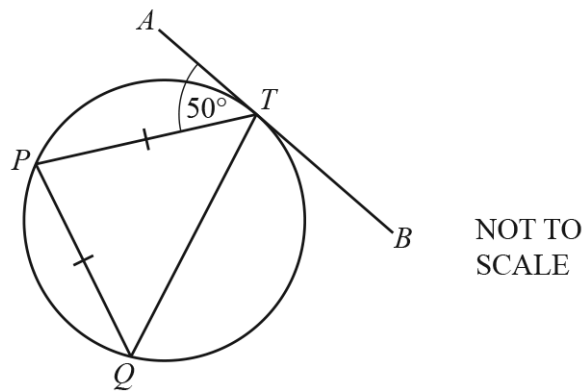
Calculate the number of sides.

..... [2]



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(a)



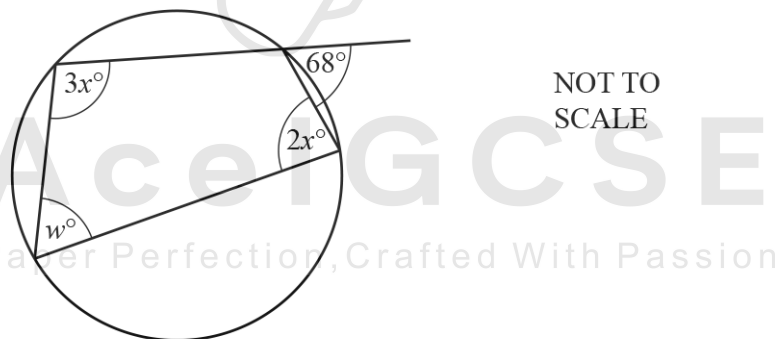
NOT TO SCALE

P , Q and T are points on a circle.
 ATB is a tangent to the circle at T and $PT = PQ$.

Find angle TPQ .

Angle $TPQ = \dots\dots\dots$ [2]

(b)



NOT TO SCALE

The diagram shows a cyclic quadrilateral with an exterior angle of 68° .

Find the value of w and the value of x .

$w = \dots\dots\dots$

$x = \dots\dots\dots$ [3]

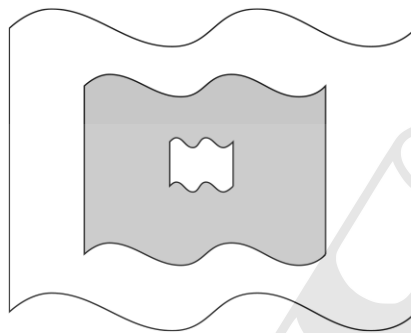
51. 0580_w21_qp_21 Q: 10

A regular polygon has an interior angle of 174° .

Find the number of sides of this polygon.

..... [2]

52. 0580_w21_qp_21 Q: 15



NOT TO
SCALE

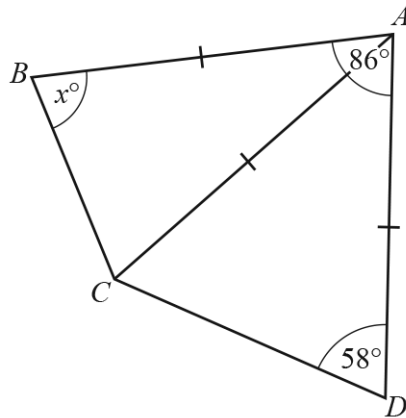
The diagram shows three shapes that are mathematically similar.
The heights of the shapes are in the ratio small : medium : large = 1 : 5 : 8.

Find the ratio shaded area : total unshaded area.
Give your answer in its simplest form.

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..... : [4]

53. 0580_w21_qp_22 Q: 4



NOT TO
SCALE

Triangle ABC and triangle ACD are isosceles.
Angle $DAB = 86^\circ$ and angle $ADC = 58^\circ$.

Find the value of x .

$x = \dots\dots\dots$ [3]

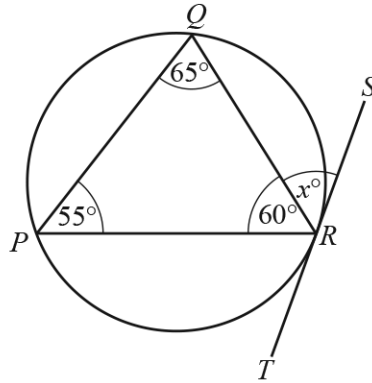
54. 0580_w21_qp_22 Q: 10

The interior angle of a regular polygon is 156° .

Work out the number of sides of this polygon.

$\dots\dots\dots$ [2]

55. 0580_w21_qp_22 Q: 14



NOT TO SCALE

P , Q and R are points on a circle.
 ST is a tangent to the circle at R .

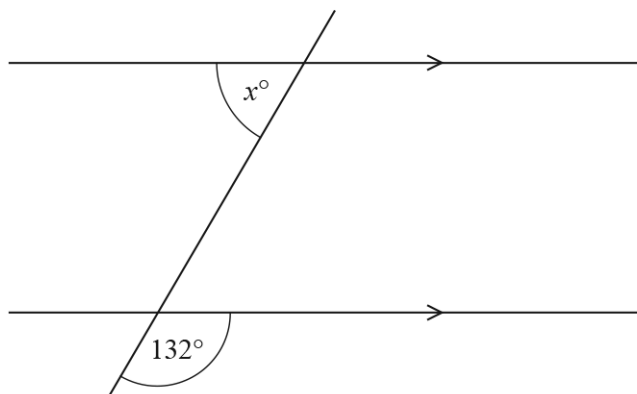
- (a) Write down the value of x .
 Give a geometrical reason for your answer.

$x = \dots\dots\dots$ because $\dots\dots\dots$
 $\dots\dots\dots$ [2]

- (b) Another tangent from the point S touches the circle at V .
 Give a geometrical reason why triangle SVR is isosceles.

$\dots\dots\dots$
 $\dots\dots\dots$ [1]

56. 0580_w21_qp_23 Q: 2



NOT TO
SCALE

The diagram shows two parallel lines intersecting a straight line.

Find the value of x .

$x = \dots\dots\dots$ [2]

57. 0580_w21_qp_23 Q: 17

Each interior angle of a regular polygon is 178.5° .

Calculate the number of sides of this polygon.

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$\dots\dots\dots$ [2]

58. 0580_w21_qp_23 Q: 20

A lake has an area of 3 km^2 .

On a map the area of the lake is 18.75 cm^2 .

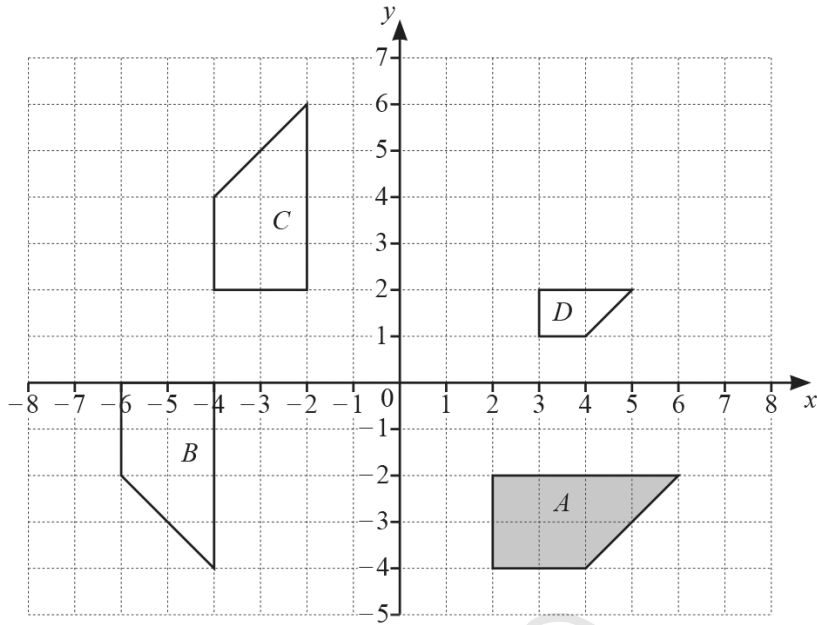
Find the scale of the map in the form $1 : n$.

1 : [3]

59. 0580_m20_QP_22 Q: 4

Find the interior angle of a regular polygon with 24 sides.

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..... [2]
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Describe fully the **single** transformation that maps

- (a) shape *A* onto shape *B*,

.....
 [3]

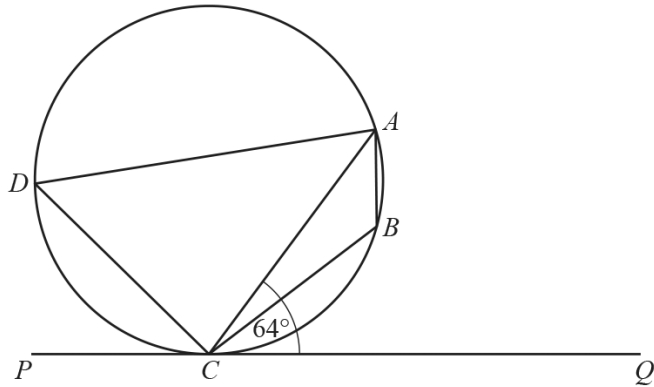
- (b) shape *A* onto shape *C*,

.....
 [2]

- (c) shape *A* onto shape *D*.

.....
 [3]

61. 0580_m20_QP_22 Q: 15



NOT TO SCALE

A, B, C and D lie on the circle.
 PCQ is a tangent to the circle at C .
 Angle $ACQ = 64^\circ$.

Work out angle ABC , giving reasons for your answer.

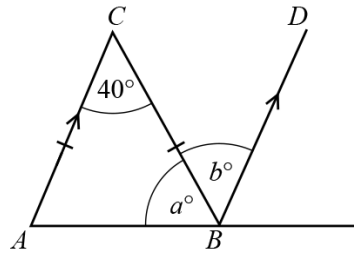
Angle $ABC = \dots\dots\dots$ because $\dots\dots\dots$
 $\dots\dots\dots$
 $\dots\dots\dots$ [3]

62. 0580_P20_QP_20 Q: 7

Using a ruler and pair of compasses only, construct a triangle with sides 5 cm, 8 cm and 10 cm.
 Leave in your construction arcs.

[2]

63. 0580_P20_QP_20 Q: 8



NOT TO SCALE

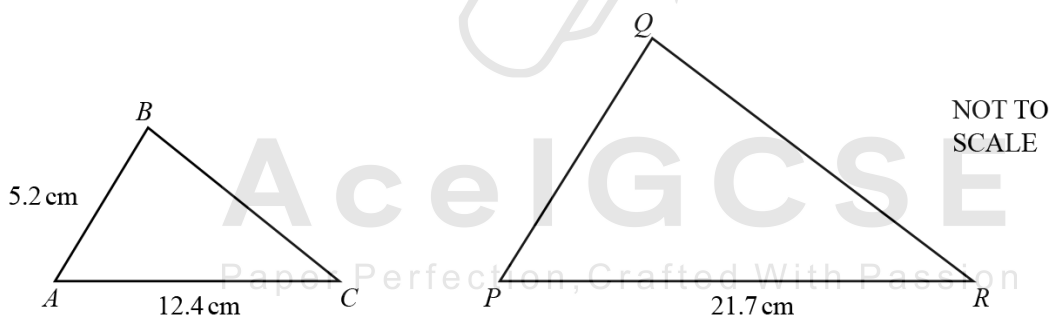
Triangle ABC is isosceles.
 AC is parallel to BD .

Find the value of a and the value of b .

$a = \dots\dots\dots$
 $b = \dots\dots\dots$ [2]

64. 0580_P20_QP_20 Q: 12

Triangle ABC is similar to triangle PQR .



NOT TO SCALE

Find PQ .

$PQ = \dots\dots\dots$ cm [2]

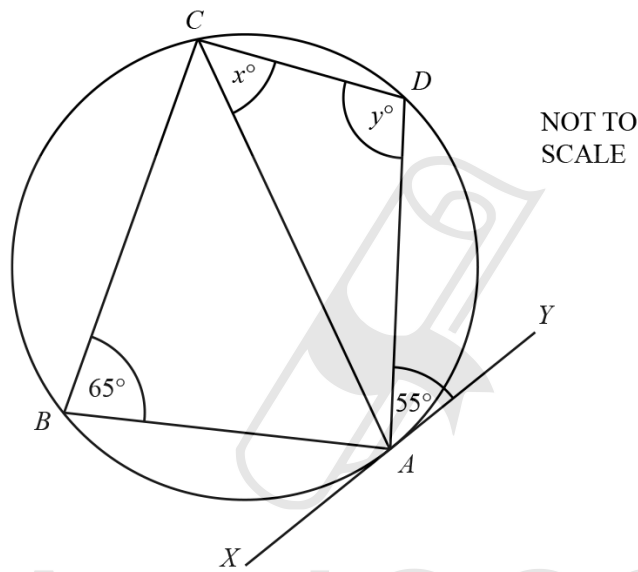
65. 0580_P20_QP_20 Q: 16

A hexagon has five angles that each measure 115° .

Calculate the size of the sixth angle.

..... [3]

66. 0580_P20_QP_20 Q: 26



A, B, C and D are points on the circumference of the circle.
The line XY is a tangent to the circle at A .

(a) Find the value of x , giving a reason for your answer.

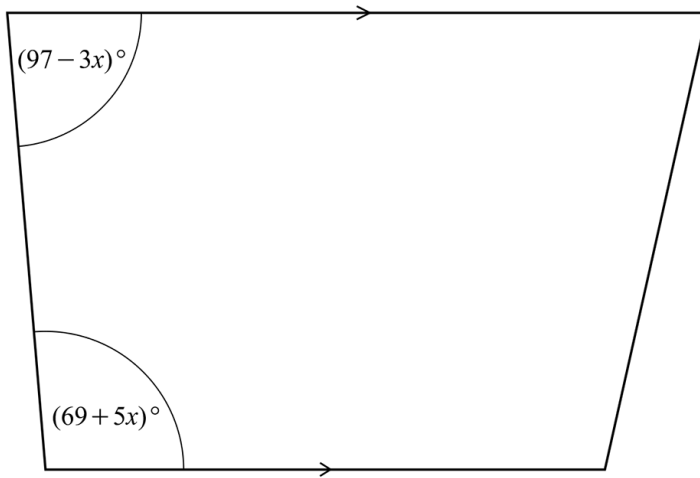
$x =$ because
..... [2]

(b) Find the value of y , giving a reason for your answer.

$y =$ because
..... [2]

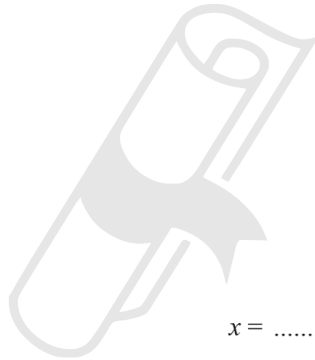
67. 0580_s20_QP_21 Q: 6

The diagram shows a trapezium.



NOT TO
SCALE

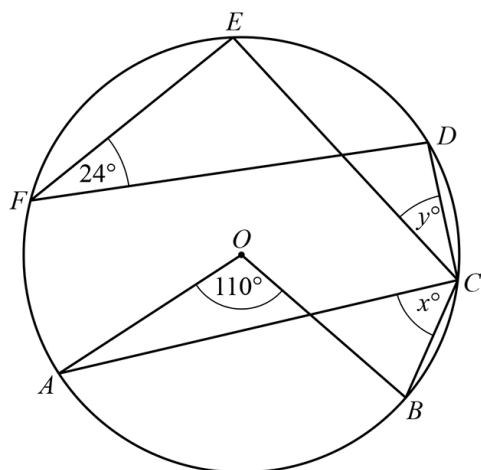
Work out the value of x .



$x = \dots\dots\dots$ [3]

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68. 0580_s20_QP_21 Q: 10



NOT TO SCALE

Points A, B, C, D, E and F lie on the circle, centre O .

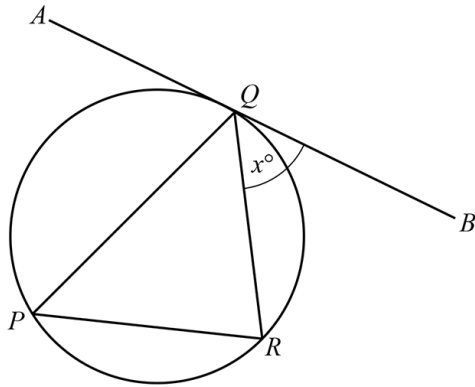
Find the value of x and the value of y .

$x = \dots\dots\dots$

$y = \dots\dots\dots$ [2]

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69. 0580_s20_QP_21 Q: 15



NOT TO SCALE

P , R and Q are points on the circle.
 AB is a tangent to the circle at Q .
 QR bisects angle PQB .
 Angle $BQR = x^\circ$ and $x < 60$.

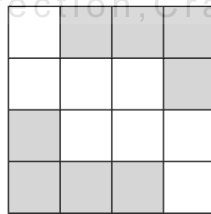
Use this information to show that triangle PQR is an isosceles triangle.
 Give a geometrical reason for each step of your work.



[3]

70. 0580_s20_QP_22 Q: 1

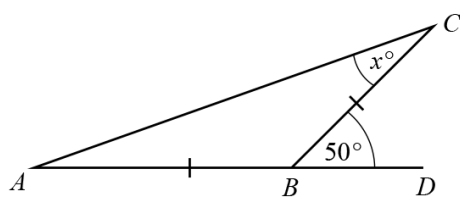
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Write down the order of rotational symmetry of the diagram.

..... [1]

71. 0580_s20_QP_22 Q: 3

NOT TO
SCALE

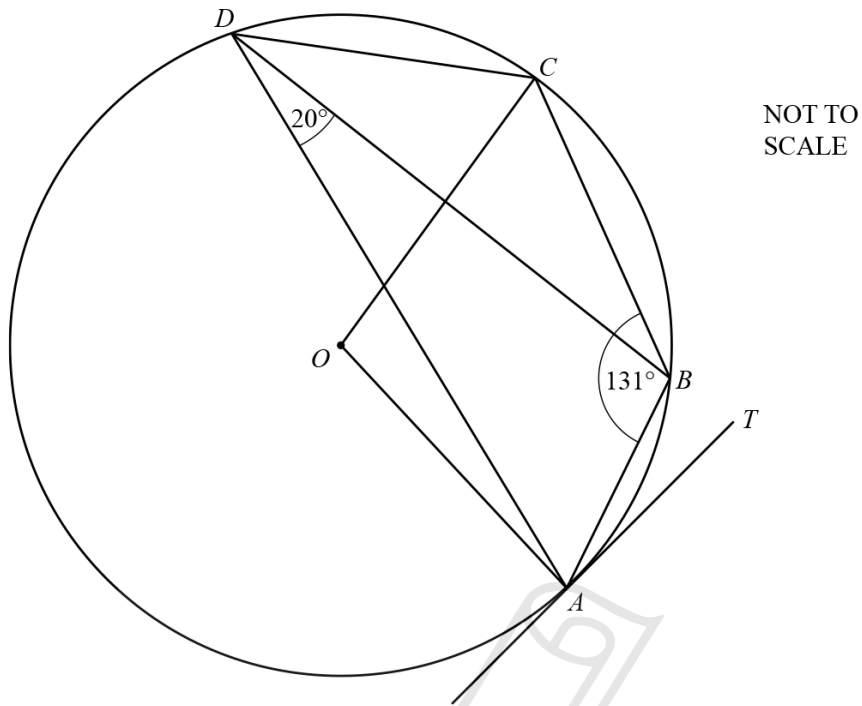
$AB = BC$ and ABD is a straight line.

Find the value of x .

$x = \dots\dots\dots$ [2]



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A, B, C and D lie on the circle, centre O .
 TA is a tangent to the circle at A .
 Angle $ABC = 131^\circ$ and angle $ADB = 20^\circ$.

Find

- (a) angle ADC ,

Angle $ADC = \dots\dots\dots$ [1]

- (b) angle AOC ,

Angle $AOC = \dots\dots\dots$ [1]

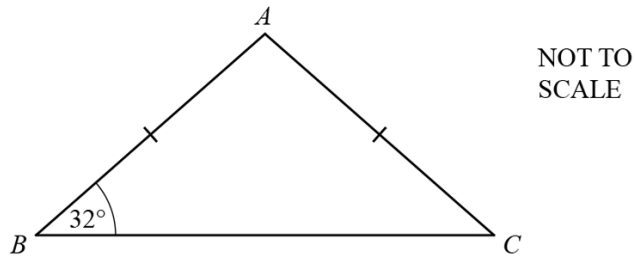
- (c) angle BAT ,

Angle $BAT = \dots\dots\dots$ [1]

- (d) angle OAB .

Angle $OAB = \dots\dots\dots$ [1]

73. 0580_s20_QP_23 Q: 3



Triangle ABC is isosceles.
 Angle $ABC = 32^\circ$ and $AB = AC$.

Find angle BAC .

Angle $BAC = \dots\dots\dots$ [2]

74. 0580_s20_QP_23 Q: 17



The diagram shows two shapes that are mathematically similar.
 The smaller shape has area 52.5 cm^2 and the larger shape has area 134.4 cm^2 .

Calculate the value of m .

$m = \dots\dots\dots$ [3]

75. 0580_w20_qp_21 Q: 2

A field, ABC , is in the shape of a triangle.
 $AC = 500\text{ m}$ and $BC = 650\text{ m}$.

Using a ruler and compasses only, complete the scale drawing of the field ABC .
Leave in your construction arcs.
Use a scale of 1 cm to represent 100 m .
The side AB has been drawn for you.

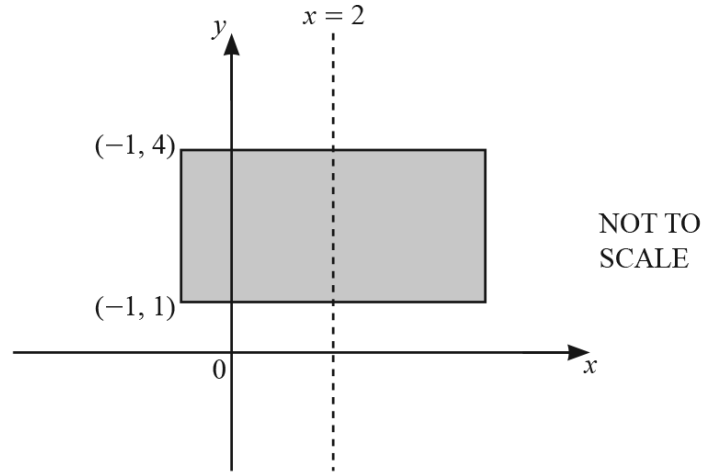


Scale: 1 cm to 100 m

[3]

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76. 0580_w20_qp_21 Q: 11



The diagram shows a rectangle with a line of symmetry at $x = 2$.
Two vertices of the rectangle are at $(-1, 1)$ and $(-1, 4)$.

The shaded region is defined by the inequalities $a \leq x \leq b$ and $c \leq y \leq d$.

Find the values of a , b , c and d .

$a =$

$b =$

$c =$

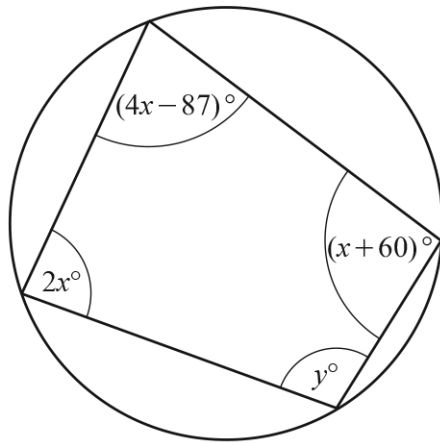
$d =$ [2]

77. 0580_w20_qp_21 Q: 12

The interior angle of a regular polygon with n sides is 156° .

Work out the value of n .

$n =$ [2]



NOT TO
SCALE

The diagram shows a cyclic quadrilateral.

Find the value of y .

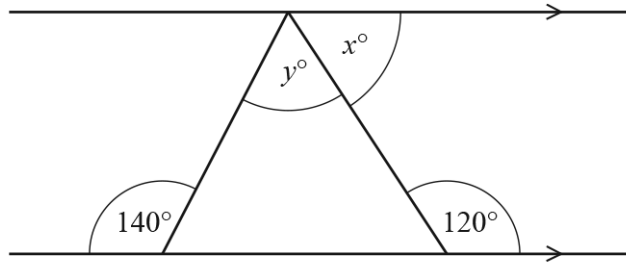


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$y = \dots\dots\dots$ [4]

79. 0580_w20_qp_22 Q: 4



NOT TO
SCALE

The diagram shows a triangle drawn between a pair of parallel lines.

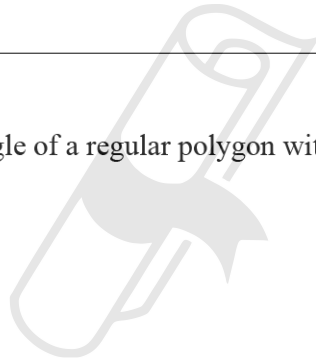
Find the value of x and the value of y .

$x = \dots\dots\dots$

$y = \dots\dots\dots$ [3]

80. 0580_w20_qp_22 Q: 8

Calculate the size of one interior angle of a regular polygon with 40 sides.



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$\dots\dots\dots$ [2]

81. 0580_w20_qp_22 Q: 20

A model of a statue has a height of 4 cm.
The volume of the model is 12 cm^3 .
The volume of the statue is $40\,500 \text{ cm}^3$.

Calculate the height of the statue.

..... cm [3]

82. 0580_w20_qp_23 Q: 3

In triangle ABC , $BC = 7.6 \text{ cm}$ and $AC = 6.2 \text{ cm}$.

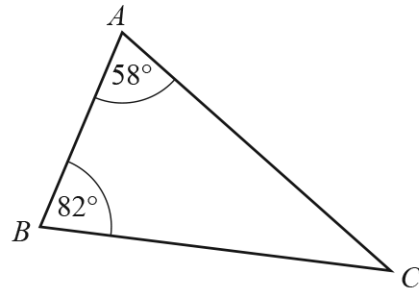
Using a ruler and compasses only, construct triangle ABC .
Leave in your construction arcs.
The side AB has been drawn for you.

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[2]

83. 0580_w20_qp_23 Q: 6



NOT TO SCALE

The diagram shows triangle ABC .
The triangle is reflected in the line BC to give a quadrilateral $ABDC$.

(a) Write down the mathematical name of the quadrilateral $ABDC$.

..... [1]

(b) Find angle ACD .

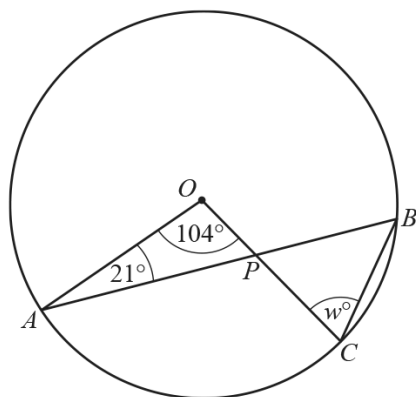
Angle $ACD =$ [2]

84. 0580_w20_qp_23 Q: 16

A paperweight has height 4 cm and volume 38.4 cm^3 .
A mathematically similar paperweight has height 7 cm.

Calculate the volume of this paperweight.

..... cm^3 [3]



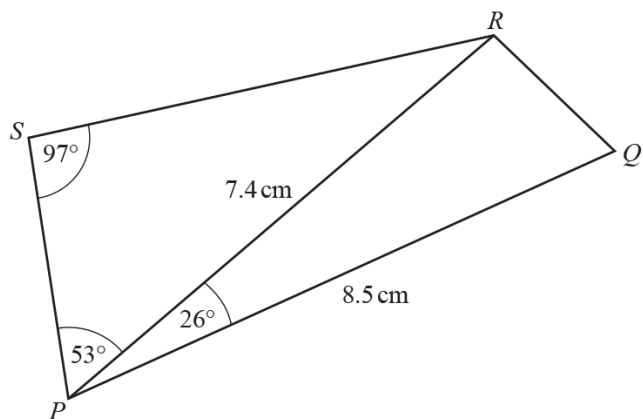
NOT TO
SCALE

A , B and C are points on the circle, centre O .
 AB and OC intersect at P .

Find the value of w .

$w = \dots\dots\dots$ [3]

86. 0580_m19_QP_22 Q: 24



NOT TO SCALE

Calculate

(a) SR ,



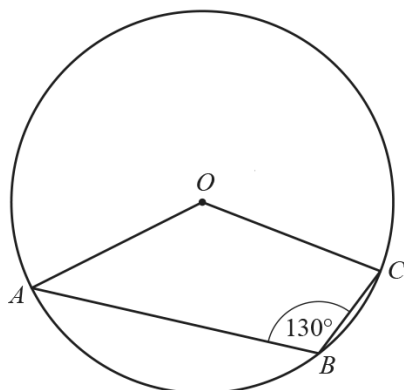
$SR = \dots\dots\dots\text{ cm}$ [3]

(b) RQ .

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$RQ = \dots\dots\dots\text{ cm}$ [4]

87. 0580_s19_QP_21 Q: 8



NOT TO
SCALE

A , B and C are points on the circle, centre O .

Find the obtuse angle AOC .

Angle AOC = [2]

88. 0580_s19_QP_22 Q: 4

Complete each statement.

(a) A quadrilateral with only one pair of parallel sides is called a [1]

(b) An angle greater than 90° but less than 180° is called [1]

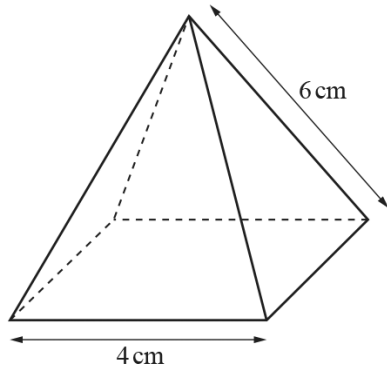
89. 0580_s19_QP_22 Q: 10

On a map with scale 1 : 25 000, the area of a lake is 33.6 square centimetres.

Calculate the actual area of the lake, giving your answer in square kilometres.

..... km^2 [2]

90. 0580_s19_QP_23 Q: 13



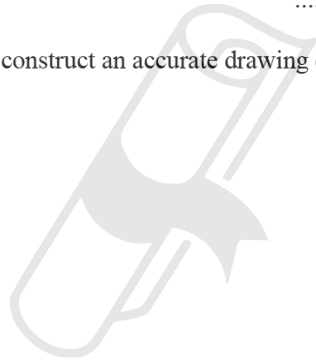
NOT TO
SCALE

The diagram shows a pyramid with a square base.
The triangular faces are congruent isosceles triangles.

- (a) Write down the number of planes of symmetry of this pyramid.

..... [1]

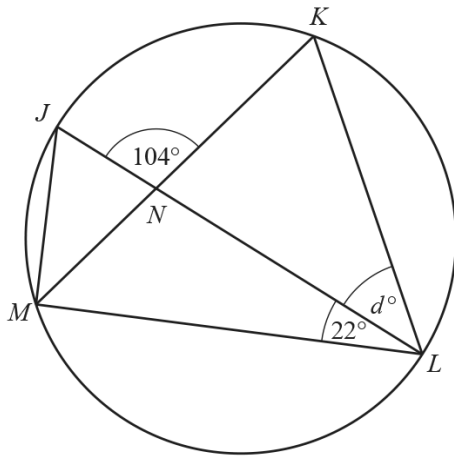
- (b) Using a ruler and compasses only, construct an accurate drawing of one of the triangular faces of the pyramid.



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[2]

91. 0580_s19_QP_23 Q: 19



NOT TO
SCALE

J, K, L and M are points on the circumference of a circle with diameter JL .
 JL and KM intersect at N .
Angle $JNK = 104^\circ$ and angle $MLJ = 22^\circ$.

Work out the value of d .



$d = \dots\dots\dots$ [4]

92. 0580_w19_QP_22 Q: 12

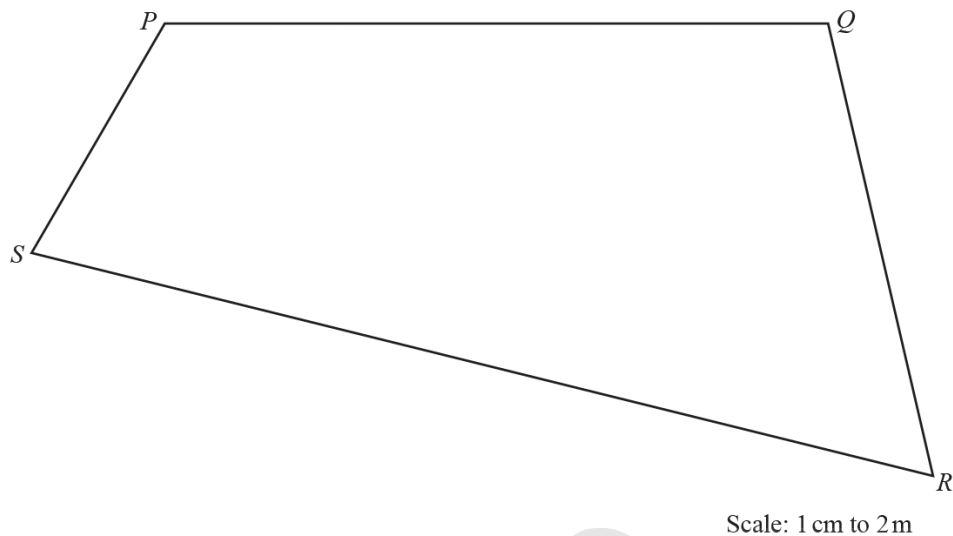
A regular polygon has an interior angle of 176° .

Find the number of sides of this polygon.

$\dots\dots\dots$ [3]

93. 0580_w19_QP_22 Q: 17

The diagram shows a scale drawing of Lei's garden, $PQRS$.
The scale is 1 centimetre represents 2 metres.



Lei has a bird table in the garden that is

- equidistant from PQ and QR

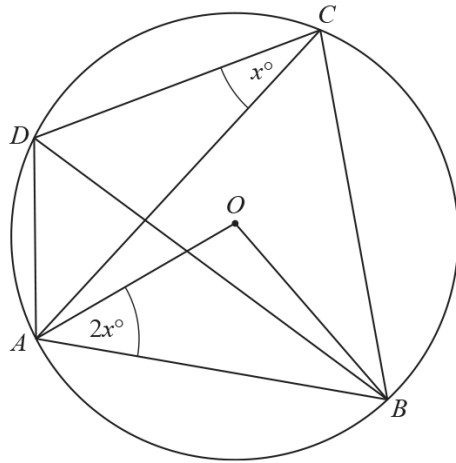
and

- 13 m from R .

On the diagram, construct the position of the bird table.

Use a ruler and compasses only and show all your construction arcs.

[4]



NOT TO SCALE

In the diagram, A , B , C and D lie on the circumference of a circle, centre O .
 Angle $ACD = x^\circ$ and angle $OAB = 2x^\circ$.

Find an expression, in terms of x , in its simplest form for

(a) angle AOB ,

Angle $AOB = \dots\dots\dots$ [1]

(b) angle ACB ,

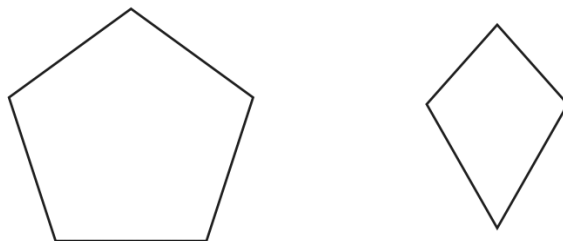
Angle $ACB = \dots\dots\dots$ [1]

(c) angle DAB .

Angle $DAB = \dots\dots\dots$ [2]

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95. 0580_m18_QP_22 Q: 5



The diagram shows a regular pentagon and a kite.

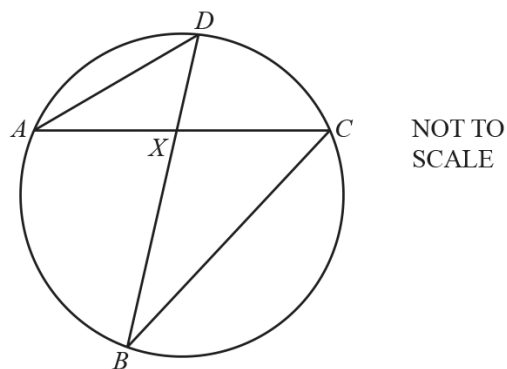
Complete the following statements.

- (a) The regular pentagon has lines of symmetry. [1]
- (b) The kite has rotational symmetry of order [1]



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96. 0580_m18_QP_22 Q: 14



A, B, C and D are points on the circumference of the circle.
 AC and BD intersect at X .

(a) Complete the statement.

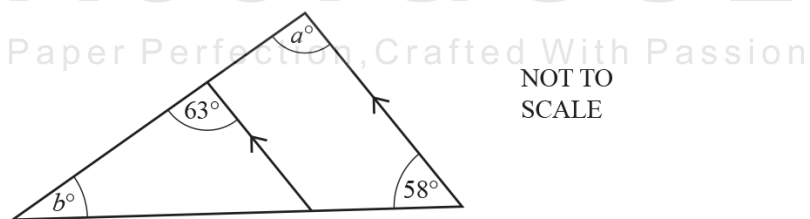
Triangle ADX is to triangle BCX . [1]

(b) The area of triangle ADX is 36 cm^2 and the area of triangle BCX is 65.61 cm^2 .
 $AX = 8.6 \text{ cm}$ and $DX = 7.2 \text{ cm}$.

Find BX .

$BX = \dots\dots\dots \text{ cm}$ [3]

97. 0580_m18_QP_22 Q: 15



Complete the statements.

$a = \dots\dots\dots$ because $\dots\dots\dots$

$\dots\dots\dots$

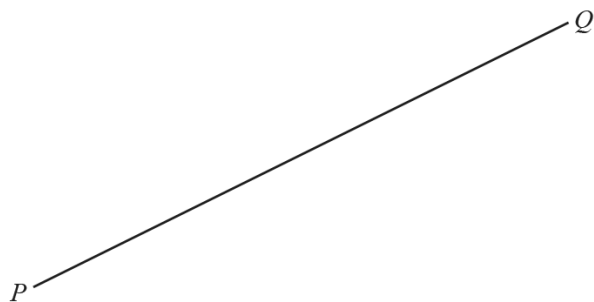
$b = \dots\dots\dots$ because $\dots\dots\dots$

$\dots\dots\dots$ [4]

98. 0580_m18_QP_22 Q: 18

In this question, use a **straight edge and compasses only** and show all your construction arcs.

- (a) Construct the perpendicular bisector of PQ .



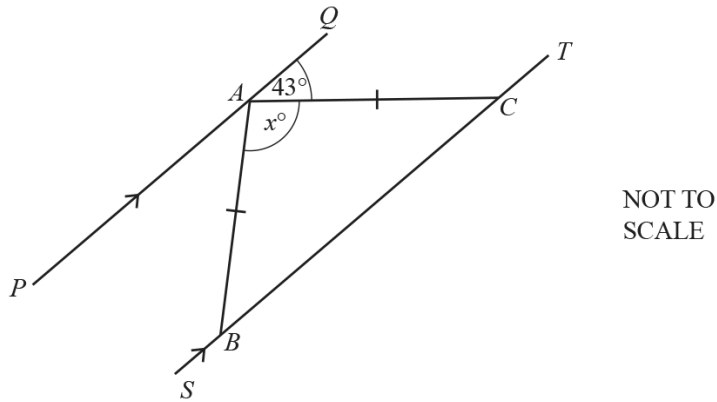
[2]

- (b) Construct the bisector of angle ABC .



[2]

99. 0580_s18_QP_21 Q: 5

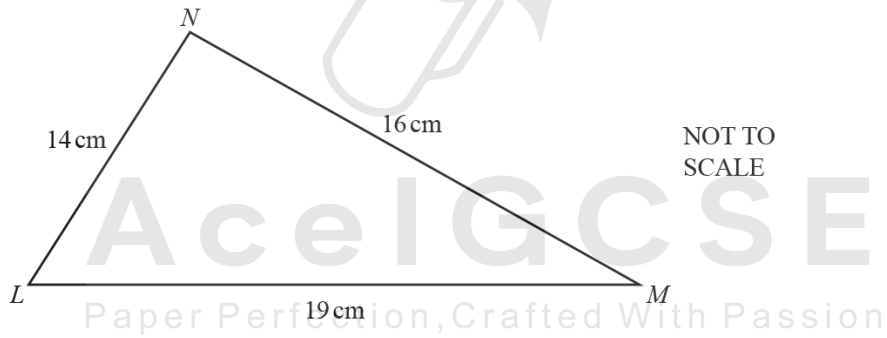


The diagram shows two parallel lines PAQ and $SBCT$.
 $AB = AC$ and angle $QAC = 43^\circ$.

Find the value of x .

$x = \dots\dots\dots [2]$

100. 0580_s18_QP_21 Q: 19



Calculate angle LMN .

Angle $LMN = \dots\dots\dots [4]$

101. 0580_s18_QP_22 Q: 9

Using a straight edge and compasses only, construct the locus of points that are equidistant from A and B .

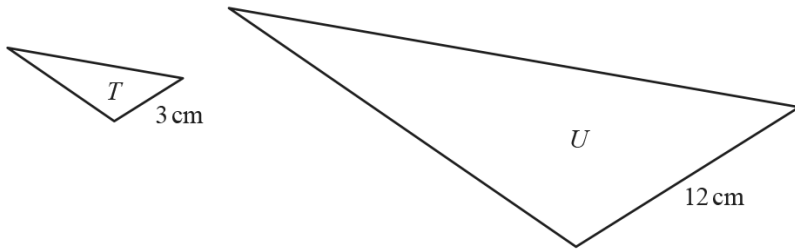
$A \cdot$

$\cdot B$



[2]

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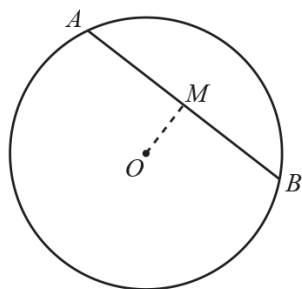
NOT TO
SCALE

The diagram shows two mathematically similar triangles, T and U .
Two corresponding side lengths are 3 cm and 12 cm.
The area of triangle T is 5 cm^2 .

Find the area of triangle U .

..... cm^2 [2]

103. 0580_s18_QP_22 Q: 16

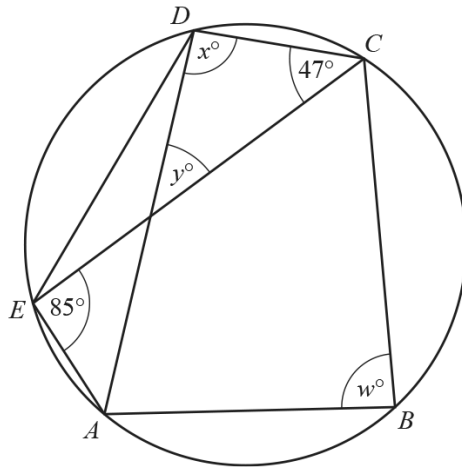
NOT TO
SCALE

The diagram shows a circle, centre O .
 AB is a chord of length 12 cm.
 M is the mid-point of AB and $OM = 4.5$ cm.

Calculate the radius of the circle.

..... cm [3]

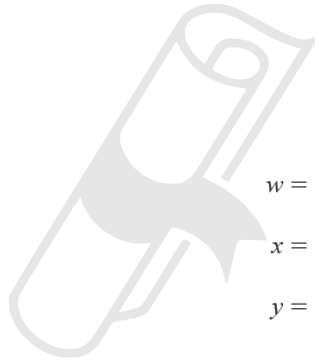
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NOT TO SCALE

The points A, B, C, D and E lie on the circumference of the circle.
 Angle $DCE = 47^\circ$ and angle $CEA = 85^\circ$.

Find the values of w, x and y .



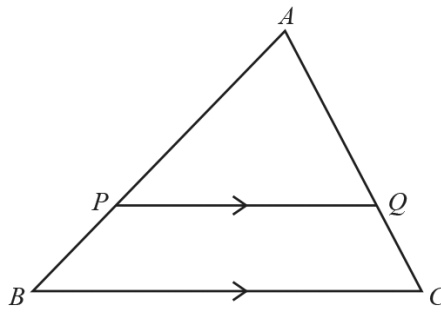
$w =$

$x =$

$y =$ [3]

105. 0580_s18_QP_23 Q: 25

(a)



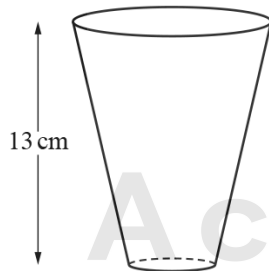
NOT TO SCALE

In the diagram, PQ is parallel to BC .
 APB and AQC are straight lines.
 $PQ = 8$ cm, $BC = 10$ cm and $AB = 9$ cm.

Calculate PB .

$PB = \dots\dots\dots$ cm [2]

(b)



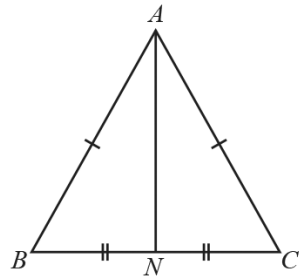
NOT TO SCALE

The diagram shows two glasses which are mathematically similar.
 The larger glass has a capacity of 0.5 litres and the smaller glass has a capacity of 0.25 litres.
 The height of the larger glass is 13 cm.

Calculate the height of the smaller glass.

$\dots\dots\dots$ cm [3]

106. 0580_w18_QP_21 Q: 2



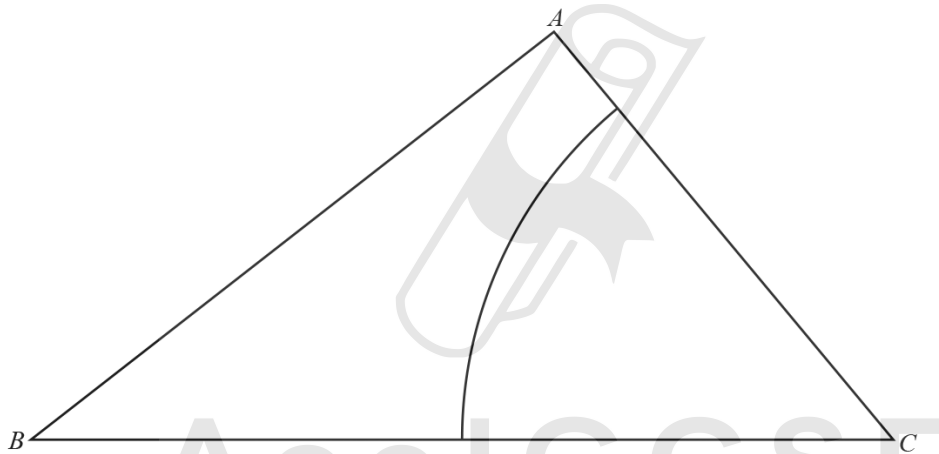
NOT TO
SCALE

In the diagram, $AB = AC$ and $BN = NC$.

Complete the statement using a mathematical term.

Triangle ABN is to triangle ACN . [1]

107. 0580_w18_QP_21 Q: 13



The diagram shows a triangle ABC and an arc with centre C and radius 6.5 cm.

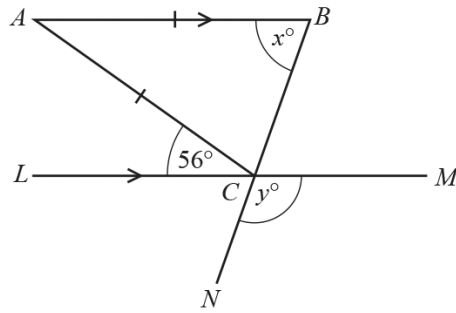
(a) Using a straight edge and compasses only, construct the locus of points inside the triangle that are equidistant from BA and BC . [2]

(b) Shade the region inside the triangle that is

- more than 6.5 cm from C
- and
- nearer to BA than to BC .

[1]

108. 0580_w18_QP_21 Q: 16



NOT TO SCALE

The diagram shows an isosceles triangle ABC with $AB = AC$. LCM and BCN are straight lines and LCM is parallel to AB . Angle $ACL = 56^\circ$.

Find the value of x and the value of y .

$x = \dots\dots\dots$
 $y = \dots\dots\dots$ [4]

109. 0580_w18_QP_22 Q: 2



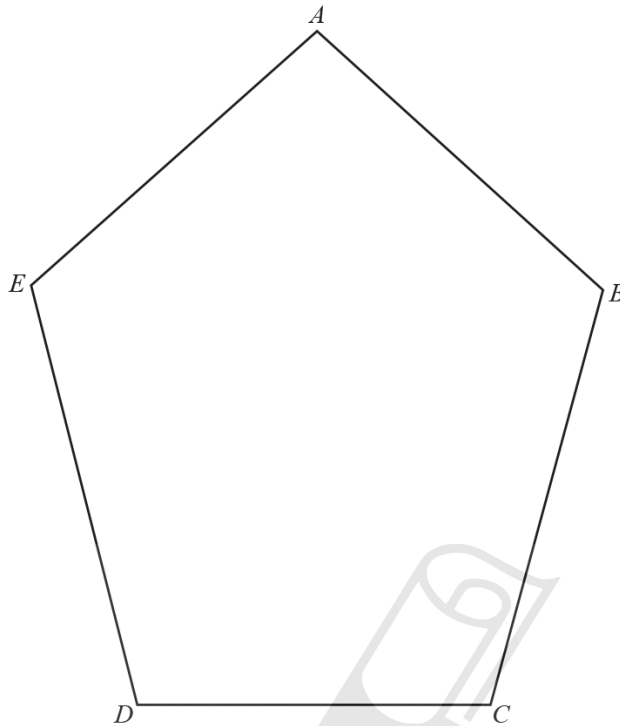
NOT TO SCALE

The diagram shows a circle, centre O . AB and DE are chords of the circle. M is the mid-point of AB and N is the mid-point of DE . $AB = DE = 9$ cm and $OM = 5$ cm.

Find ON .

$ON = \dots\dots\dots$ cm [1]

The diagram shows a pentagon $ABCDE$.

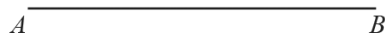


- (a) Using a straight edge and compasses only, construct the bisector of angle BCD . [2]
- (b) Draw the locus of the points inside the pentagon that are 3 cm from E . [1]
- (c) Shade the region inside the pentagon that is
- less than 3 cm from E
 - and
 - nearer to DC than to BC .
- [1]
-

111. 0580_m17_QP_22 Q: 2

The line AB is one side of an equilateral triangle ABC .

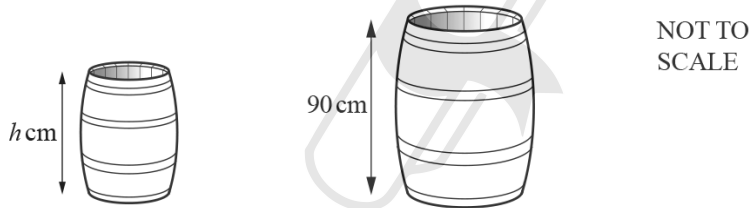
Using a straight edge and compasses only, construct triangle ABC .



[2]

112. 0580_s17_QP_21 Q: 11

The two barrels in the diagram are mathematically similar.



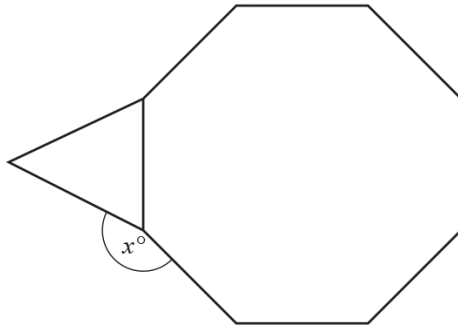
The smaller barrel has a height of h cm and a capacity of 100 litres.
The larger barrel has a height of 90 cm and a capacity of 160 litres.

Work out the value of h .

$h = \dots\dots\dots$ [3]

113. 0580_s17_QP_21 Q: 14

The diagram shows a regular octagon joined to an equilateral triangle.



NOT TO
SCALE

Work out the value of x .

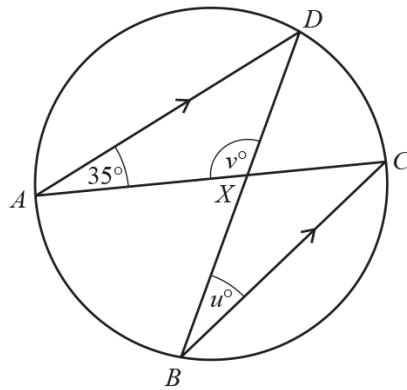


$x = \dots\dots\dots$ [3]

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114. 0580_s17_QP_21 Q: 21

(a)



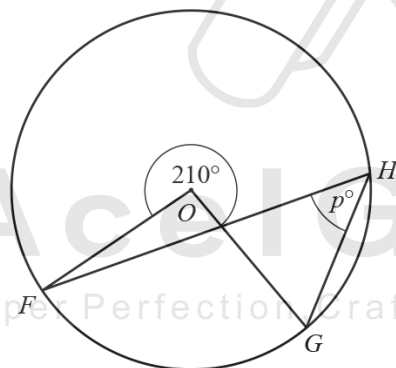
NOT TO SCALE

A, B, C and D are points on the circle.
 AD is parallel to BC .
 The chords AC and BD intersect at X .

Find the value of u and the value of v .

$u = \dots\dots\dots$
 $v = \dots\dots\dots$ [3]

(b)



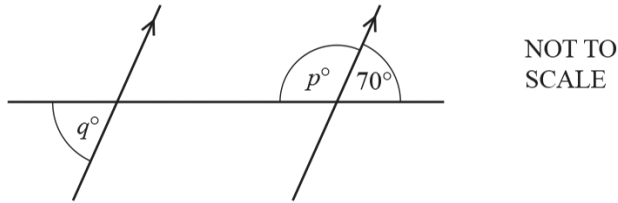
NOT TO SCALE

F, G and H are points on the circle, centre O .

Find the value of p .

$p = \dots\dots\dots$ [2]

115. 0580_s17_QP_22 Q: 8



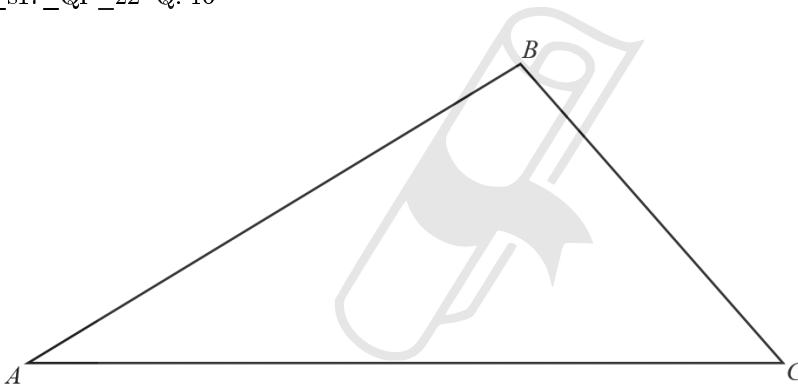
The diagram shows a straight line intersecting two parallel lines.

Find the value of p and the value of q .

$p = \dots\dots\dots$

$q = \dots\dots\dots$ [2]

116. 0580_s17_QP_22 Q: 16

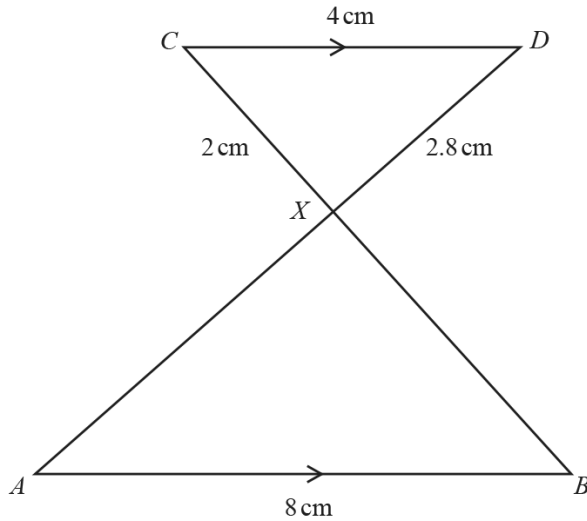


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(a) Using a straight edge and compasses only, construct the bisector of angle BAC . [2]

(b) Shade the region inside the triangle that is nearer to AC than to AB . [1]

117. 0580_s17_QP_22 Q: 24



NOT TO SCALE

In the diagram, AB and CD are parallel.
 AD and BC intersect at X .
 $AB = 8$ cm, $CD = 4$ cm, $CX = 2$ cm and $DX = 2.8$ cm.

(a) Complete this mathematical statement.

Triangle ABX is to triangle DCX . [1]

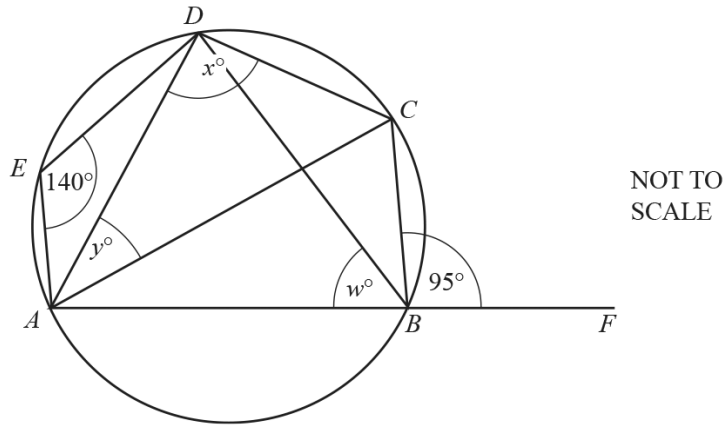
(b) Calculate AX .

$AX = \dots\dots\dots$ cm [2]

(c) The area of triangle ABX is y cm².

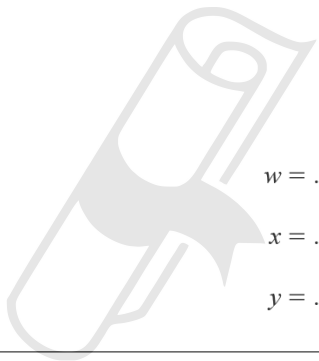
Find the area of triangle DCX in terms of y .

$\dots\dots\dots$ cm² [1]



A, B, C, D and E lie on the circle.
 AB is extended to F .
 Angle $AED = 140^\circ$ and angle $CBF = 95^\circ$.

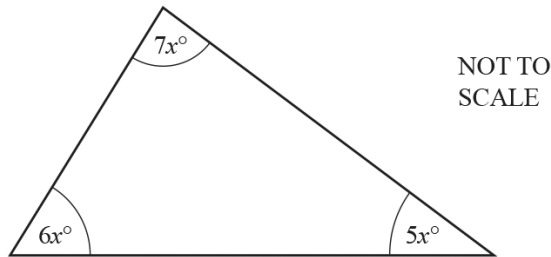
Find the values of w, x and y .



$w = \dots\dots\dots$
 $x = \dots\dots\dots$
 $y = \dots\dots\dots [5]$

119. 0580_s17_QP_23 Q: 10

The three angles in a triangle are $5x^\circ$, $6x^\circ$ and $7x^\circ$.



(a) Find the value of x .

$x = \dots\dots\dots$ [2]

(b) Work out the size of the largest angle in the triangle.

$\dots\dots\dots$ [1]

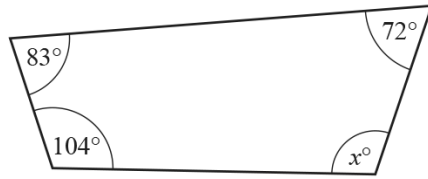
120. 0580_s17_QP_23 Q: 13

Two bottles and their labels are mathematically similar.
 The smaller bottle contains 0.512 litres of water and has a label with area 96 cm^2 .
 The larger bottle contains 1 litre of water.

Calculate the area of the larger label.

$\dots\dots\dots \text{cm}^2$ [3]

121. 0580_w17_QP_21 Q: 1



NOT TO
SCALE

The diagram shows a quadrilateral.

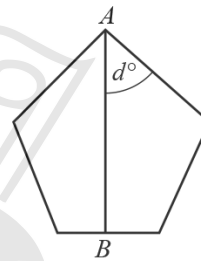
Find the value of x .

$x = \dots\dots\dots [1]$

122. 0580_w17_QP_21 Q: 11

The diagram shows a regular pentagon.
 AB is a line of symmetry.

Work out the value of d .



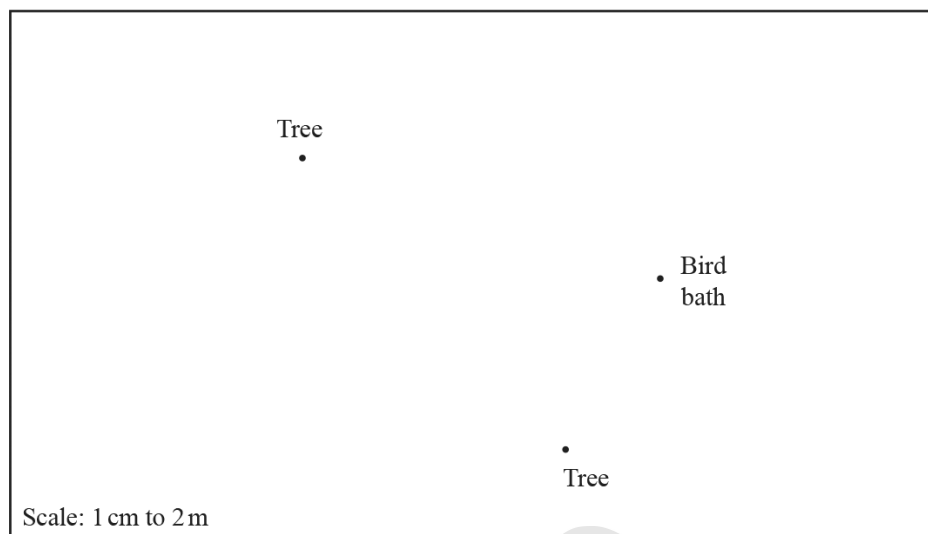
NOT TO
SCALE

$d = \dots\dots\dots [3]$

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123. 0580_w17_QP_21 Q: 18

The diagram shows a scale drawing of Tariq's garden.
The scale is 1 centimetre represents 2 metres.

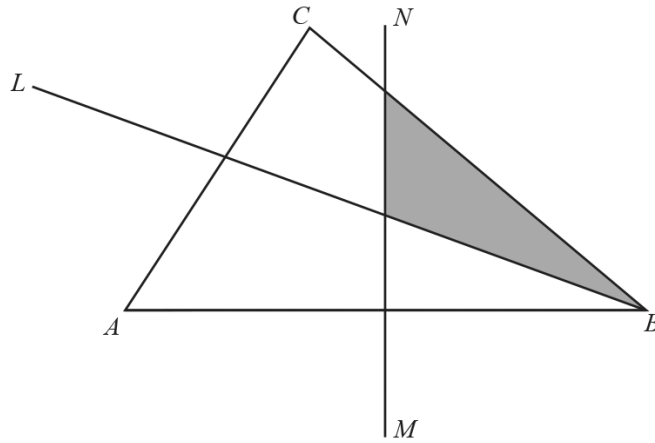


Tariq puts a statue in the garden.
The statue is equidistant from the two trees and 10m from the bird bath.

Find, by construction, the point where Tariq puts the statue.
Label the point *S*.

[4]

124. 0580_w17_QP_22 Q: 3



In the diagram, BL is the bisector of angle ABC and MN is the perpendicular bisector of AB .

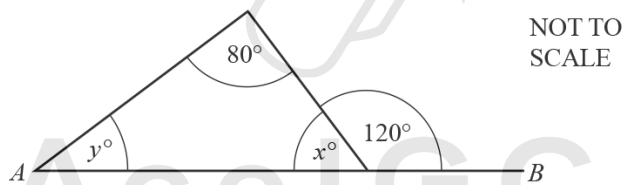
Complete the statement.

The shaded region contains the points, inside triangle ABC , that are

- nearer to B than to A
- and
- nearer to than to

[1]

125. 0580_w17_QP_22 Q: 5



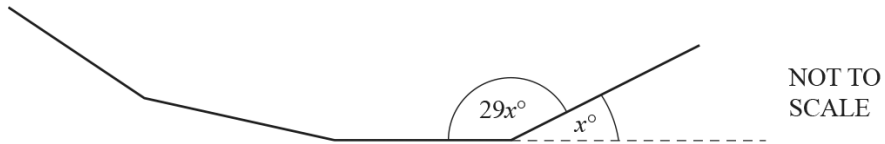
In the diagram, AB is a straight line.

Find the value of x and the value of y .

$x = \dots\dots\dots$

$y = \dots\dots\dots$ [2]

126. 0580_w17_QP_22 Q: 17

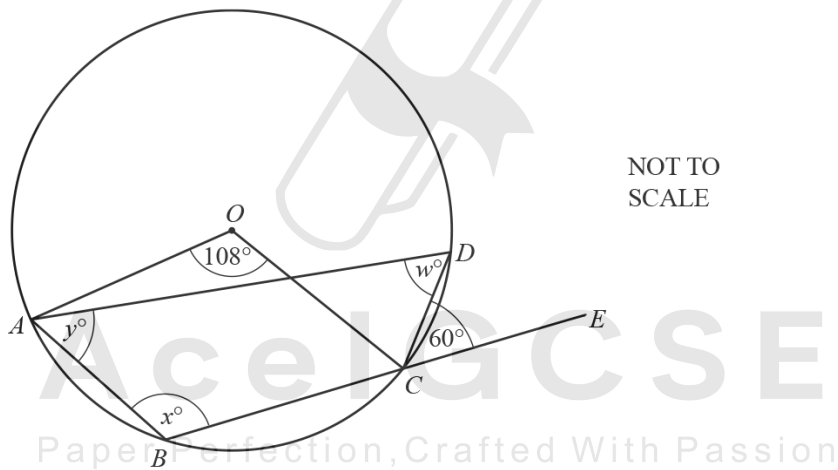


The diagram shows part of a regular polygon.
 The exterior angle is x° .
 The interior angle is $29x^\circ$.

Work out the number of sides of this polygon.

..... [3]

127. 0580_w17_QP_22 Q: 22



A, B, C and D are points on the circle, centre O .
 BCE is a straight line.
 Angle $AOC = 108^\circ$ and angle $DCE = 60^\circ$.

Calculate the values of w, x and y .

$w =$
 $x =$
 $y =$ [3]

128. 0580_w17_QP_23 Q: 4

A quadrilateral has one line of symmetry and no rotational symmetry.

Write down the name of this quadrilateral.

..... [1]

129. 0580_w17_QP_23 Q: 11

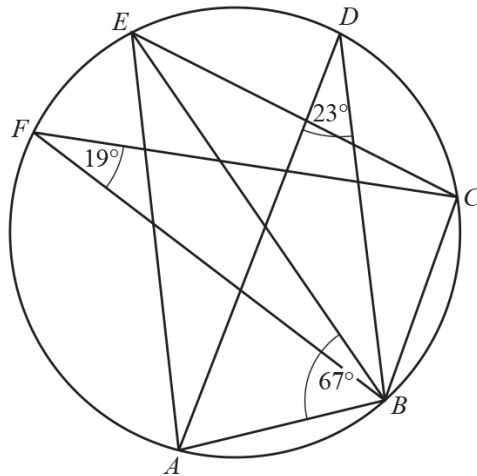
Calculate the size of one interior angle of a regular 12-sided polygon.

..... [3]



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130. 0580_w17_QP_23 Q: 22



NOT TO
SCALE

In the diagram, points A, B, C, D, E and F lie on the circumference of the circle.
Angle $BFC = 19^\circ$, angle $ADB = 23^\circ$ and angle $ABE = 67^\circ$.

Work out

(a) angle BEC ,

Angle $BEC = \dots\dots\dots [1]$

(b) angle ABC ,

Angle $ABC = \dots\dots\dots [3]$

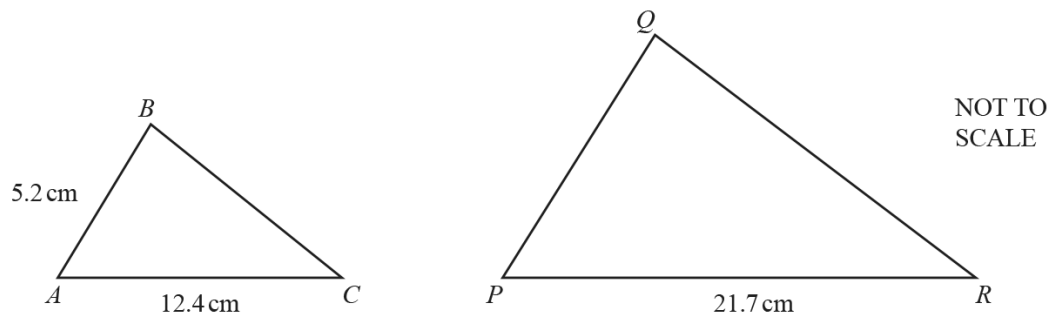
(c) angle BCE .

Angle $BCE = \dots\dots\dots [2]$

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131. 0580_m16_QP_22 Q: 5

Triangle ABC is similar to triangle PQR .



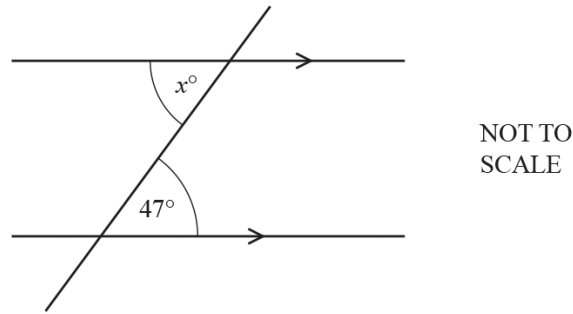
Find PQ .

$PQ = \dots\dots\dots$ cm [2]

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132. 0580_m16_QP_22 Q: 18

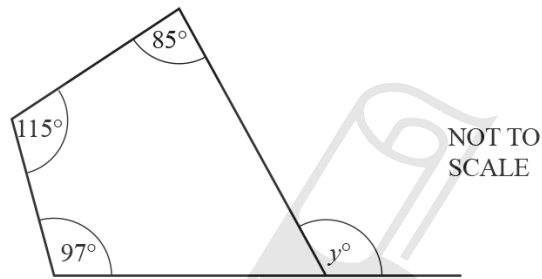
(a)



Find the value of x .

$x = \dots\dots\dots [1]$

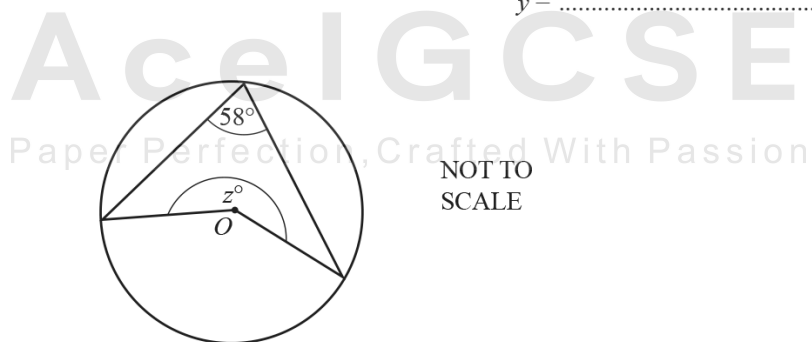
(b)



Find the value of y .

$y = \dots\dots\dots [2]$

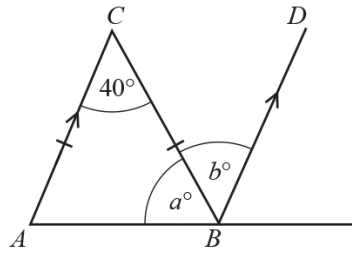
(c)



The diagram shows a circle, centre O .

Find the value of z .

$z = \dots\dots\dots [2]$



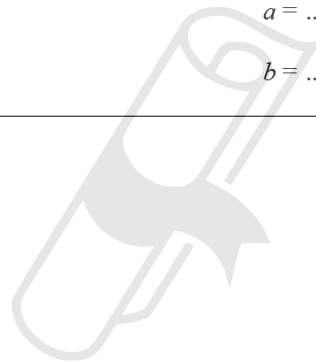
NOT TO
SCALE

Triangle ABC is isosceles and AC is parallel to BD .

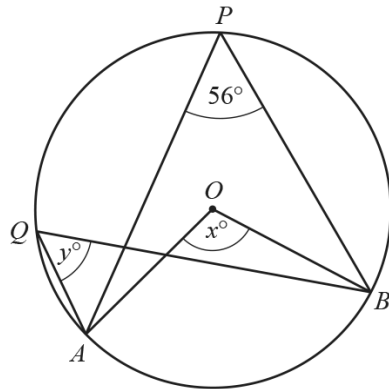
Find the value of a and the value of b .

$a = \dots\dots\dots$

$b = \dots\dots\dots [2]$



134. 0580_s16_QP_21 Q: 11



NOT TO SCALE

A, B, P and Q lie on the circle, centre O .
Angle $APB = 56^\circ$.

Find the value of

(a) x ,

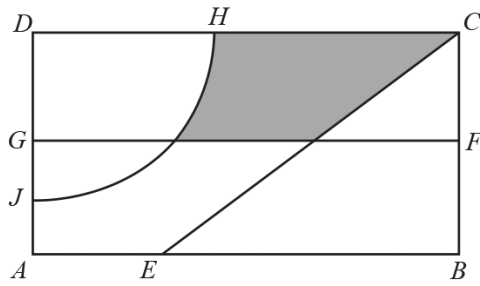
$x = \dots\dots\dots [1]$

(b) y .

$y = \dots\dots\dots [1]$

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135. 0580_s16_QP_21 Q: 14



NOT TO
SCALE

The diagram shows a rectangular garden divided into different areas.

FG is the perpendicular bisector of BC .

The arc HJ has centre D and radius 20 m.

CE is the bisector of angle DCB .

Write down two more statements using loci to describe the shaded region inside the garden.

The shaded region is

- nearer to C than to B
-
- [2]

136. 0580_s16_QP_21 Q: 17

Five angles of a hexagon are each 115° .

Calculate the size of the sixth angle.

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..... [3]

137. 0580_s16_QP_22 Q: 4

A quadrilateral has rotational symmetry of order 2 and no lines of symmetry.

Write down the mathematical name of this quadrilateral.

..... [1]

138. 0580_s16_QP_22 Q: 9

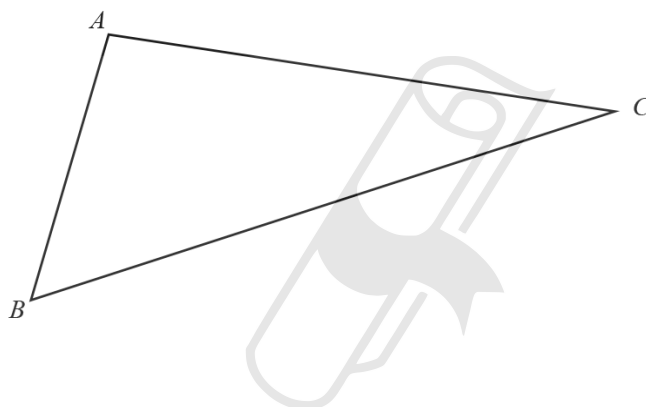
A regular polygon has an interior angle of 172° .

Find the number of sides of this polygon.

..... [3]

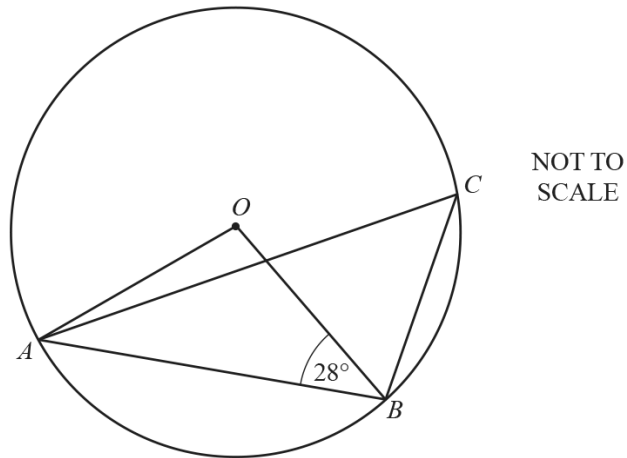
139. 0580_s16_QP_22 Q: 17

The diagram shows triangle ABC .



(a) Using a straight edge and compasses only, construct the bisector of angle ABC . [2]

(b) Draw the locus of points inside the triangle that are 3 cm from AC . [1]



In the diagram, A , B and C lie on the circumference of a circle, centre O .

Work out the size of angle ACB .

Give a reason for each step of your working.



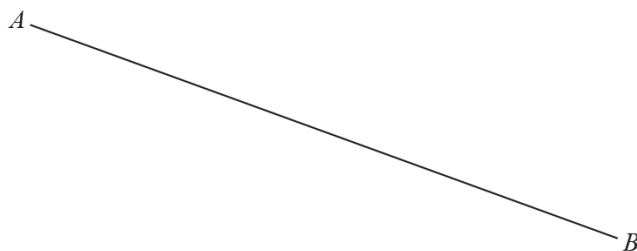
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Angle $ACB = \dots\dots\dots$ [4]

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141. 0580_s16_QP_23 Q: 6

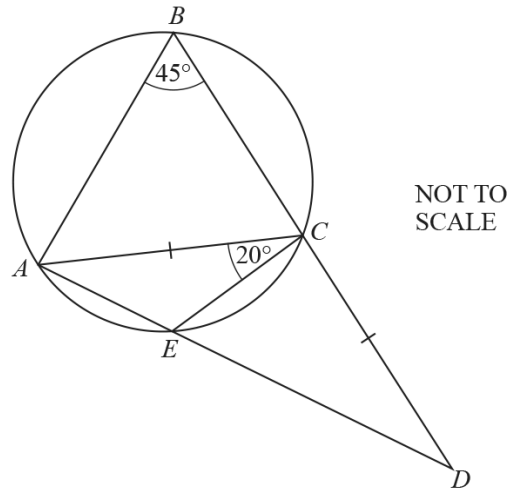
Using a straight edge and compasses only, construct the perpendicular bisector of the line AB .



[2]

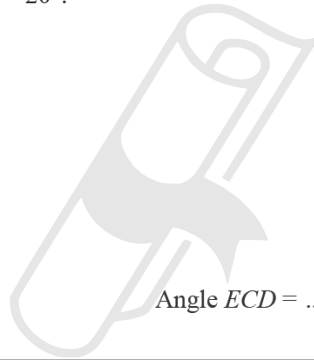


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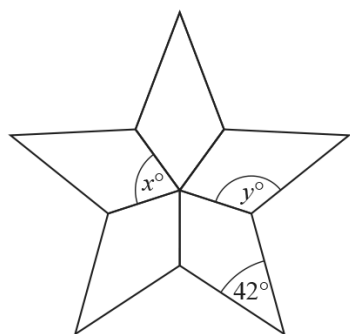
ABCE is a cyclic quadrilateral.
AED and *BCD* are straight lines.
 $AC = CD$, angle $ABC = 45^\circ$ and angle $ACE = 20^\circ$.

Work out angle ECD .



Angle $ECD = \dots\dots\dots$ [3]

143. 0580_s16_QP_23 Q: 13



NOT TO
SCALE

The diagram is made from 5 congruent kites.

Work out the value of

(a) x ,

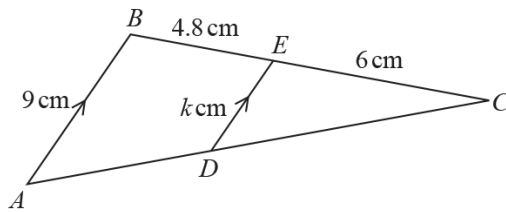
$x = \dots\dots\dots$ [1]

(b) y .

$y = \dots\dots\dots$ [2]

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(a)

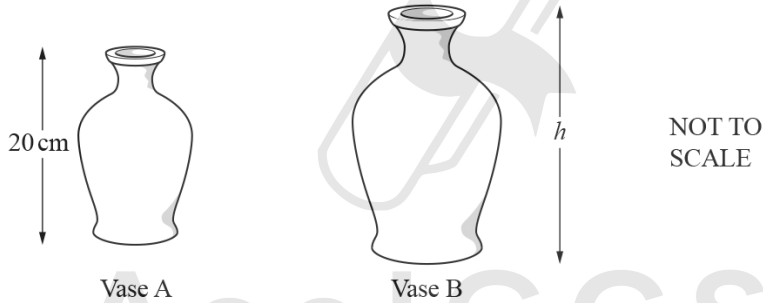


NOT TO SCALE

Triangles CBA and CED are similar.
 AB is parallel to DE .
 $AB = 9$ cm, $BE = 4.8$ cm, $EC = 6$ cm and $ED = k$ cm.

Work out the value of k .

(b)



NOT TO SCALE

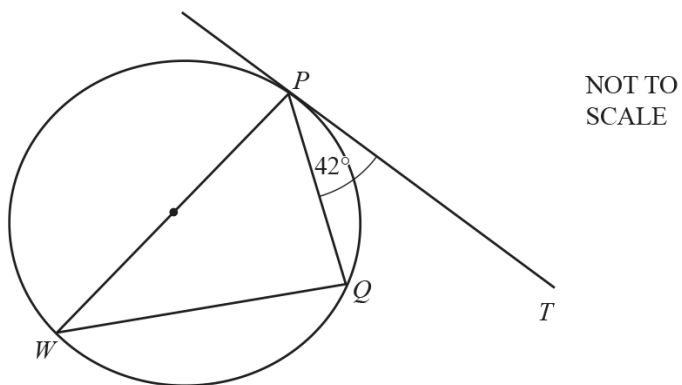
The diagram shows two mathematically similar vases.
 Vase A has height 20 cm and volume 1500 cm^3 .
 Vase B has volume 2592 cm^3 .

Calculate h , the height of vase B.

$k = \dots\dots\dots$ [2]

$h = \dots\dots\dots$ cm [3]

145. 0580_w16_QP_21 Q: 6



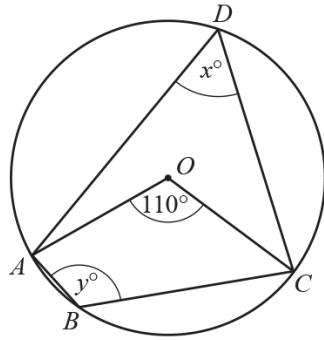
In the diagram, PT is a tangent to the circle at P .
 PW is a diameter and angle $TPQ = 42^\circ$.

Find angle PWQ .

Angle $PWQ = \dots\dots\dots [2]$

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146. 0580_w16_QP_21 Q: 9



NOT TO
SCALE

A, B, C and D lie on the circle, centre O .

Find the value of x and the value of y .

$x = \dots\dots\dots$

$y = \dots\dots\dots [2]$

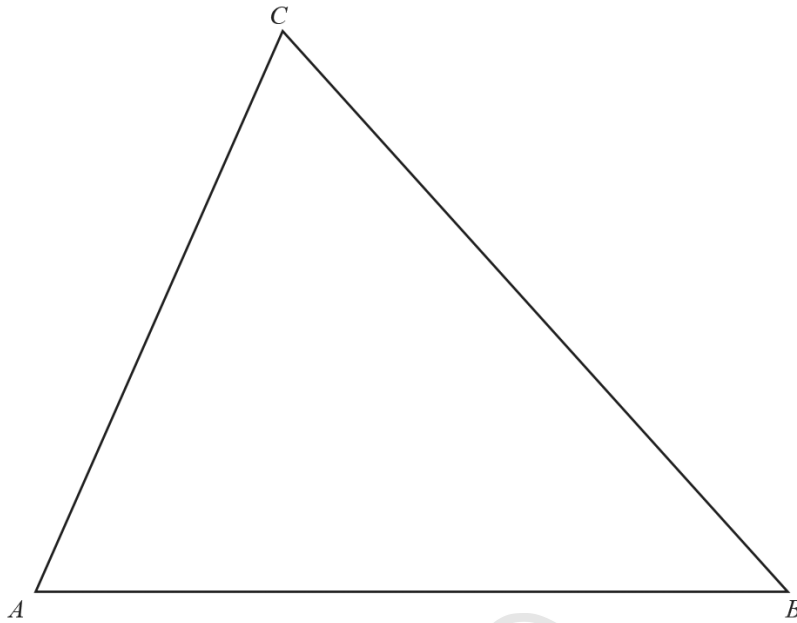
147. 0580_w16_QP_21 Q: 16

Two cups are mathematically similar.
The larger cup has capacity 0.5 litres and height 8 cm.
The smaller cup has capacity 0.25 litres.

Find the height of the smaller cup.

$\dots\dots\dots$ cm [3]

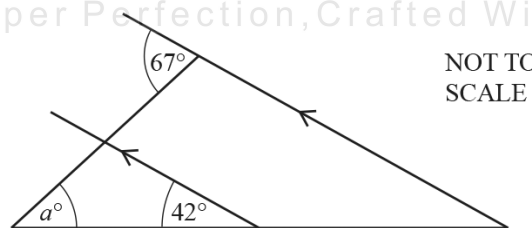
148. 0580_w16_QP_21 Q: 17



- (a) Construct the locus of points, inside the triangle, that are 5 cm from B . [1]
- (b) Construct the locus of points, inside the triangle, that are equidistant from AB and BC . [2]
- (c) Shade the region, inside the triangle, containing points that are
- more than 5 cm from B
 - and
 - nearer to AB than to BC .
- [1]

149. 0580_w16_QP_22 Q: 2

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NOT TO
SCALE

Find the value of a .

$a = \dots\dots\dots$ [2]

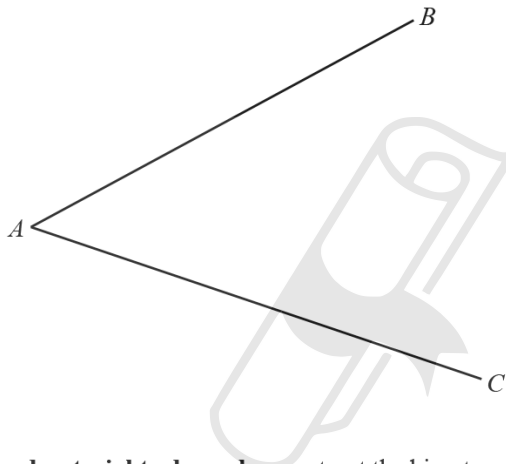
150. 0580_w16_QP_22 Q: 10

The length of a backpack of capacity 30 litres is 53 cm.

Calculate the length of a mathematically similar backpack of capacity 20 litres.

..... cm [3]

151. 0580_w16_QP_22 Q: 11



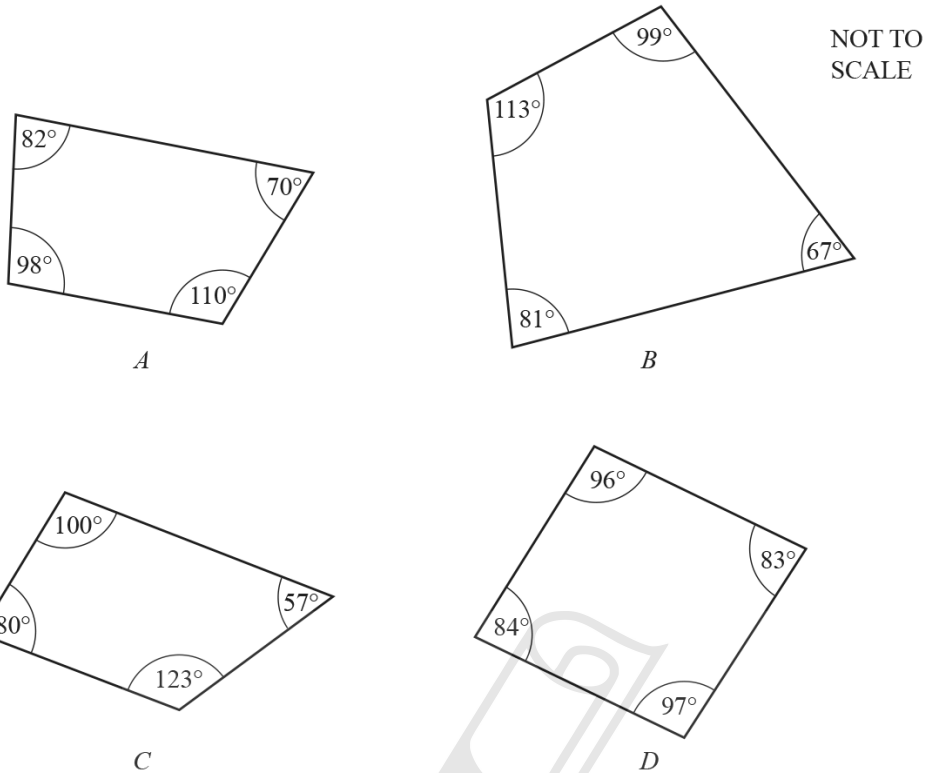
(a) Using compasses and a straight edge only, construct the bisector of angle BAC . [2]

(b) Complete the statement.

The bisector of angle BAC is the locus of points that are

..... [1]

152. 0580_w16_QP_23 Q: 3



The diagram shows four quadrilaterals A , B , C and D .

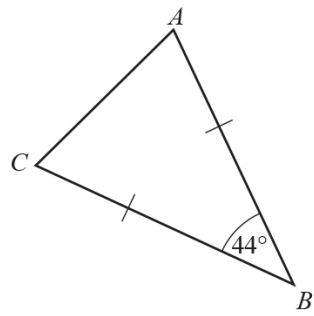
Which one of these could be a cyclic quadrilateral?

.....[1]

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(a)



NOT TO SCALE

Triangle ABC is an isosceles triangle with $AB = CB$.
Angle $ABC = 44^\circ$.

Find angle ACB .

Angle $ACB = \dots\dots\dots$ [1]

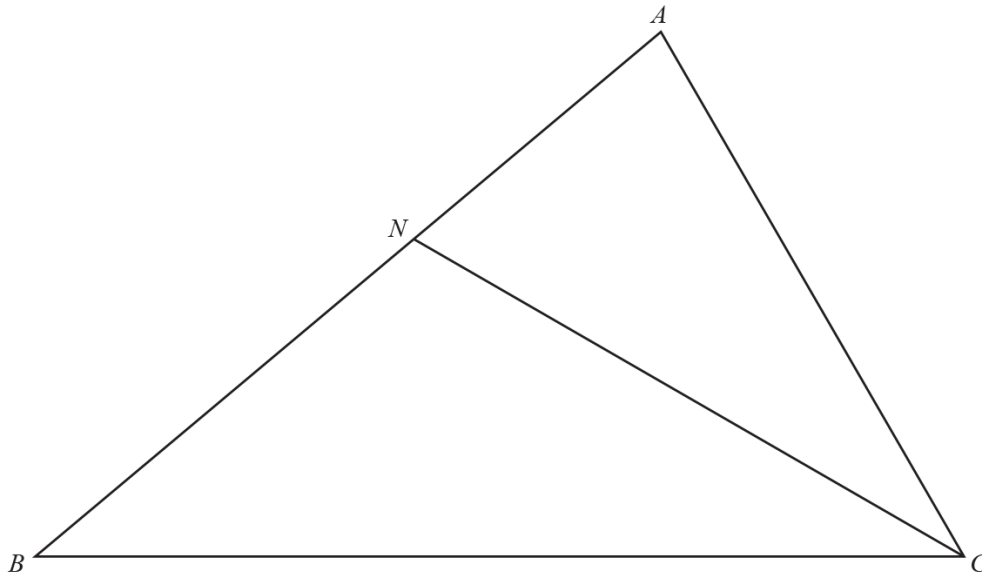
(b) A regular polygon has an exterior angle of 40° .

Work out the number of sides of this polygon.

AceIGCSE [2]

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154. 0580_m15_QP_22 Q: 6



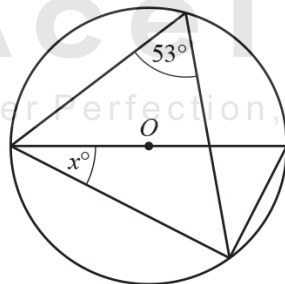
In triangle ABC , CN is the bisector of angle ACB .

(a) Using a ruler and compasses only, construct the locus of points inside triangle ABC that are 5.7 cm from B . [1]

(b) Shade the region inside triangle ABC that is
 • more than 5.7 cm from B
 and
 • nearer to BC than to AC . [1]

155. 0580_m15_QP_22 Q: 7

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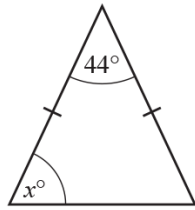
NOT TO SCALE

The diagram shows a circle, centre O .

Find the value of x .

Answer $x =$ [2]

(a)



NOT TO
SCALE

The diagram shows an isosceles triangle.

Find the value of x .

Answer(a) $x = \dots\dots\dots$ [1]

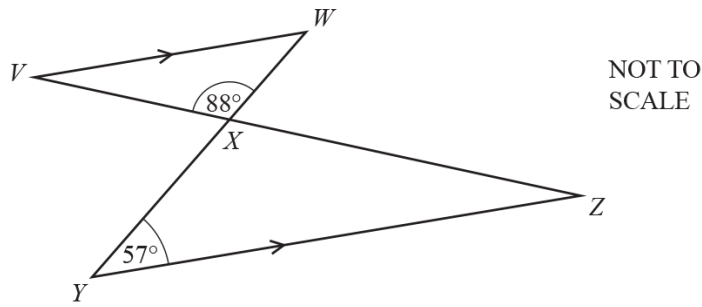
(b) The exterior angle of a regular polygon is 24° .

Find the number of sides of this regular polygon.

Answer(b) $\dots\dots\dots$ [2]

157. 0580_m15_QP_22 Q: 20

(a)

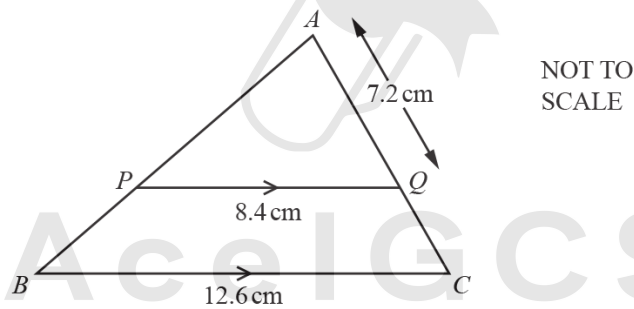


Two straight lines VZ and YW intersect at X .
 VW is parallel to YZ , angle $XYZ = 57^\circ$ and angle $VXW = 88^\circ$.

Find angle WVX .

Answer(a) Angle $WVX = \dots\dots\dots$ [2]

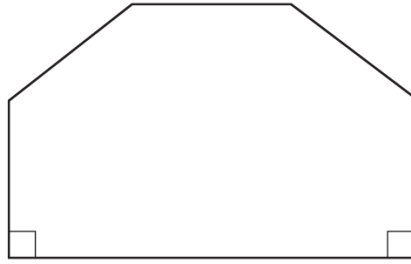
(b)



ABC is a triangle and PQ is parallel to BC .
 $BC = 12.6$ cm, $PQ = 8.4$ cm and $AQ = 7.2$ cm.

Find AC .

158. 0580_P15_QP_20 Q: 6



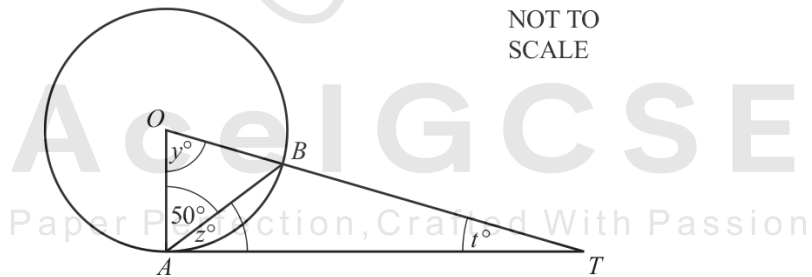
NOT TO
SCALE

The front of a house is in the shape of a hexagon with two right angles.
The other four angles are all the same size.

Calculate the size of one of these angles.

Answer [3]

159. 0580_P15_QP_20 Q: 7



TA is a tangent at A to the circle, centre O .
Angle $OAB = 50^\circ$.

Find the value of

(a) y ,

Answer(a) $y =$ [1]

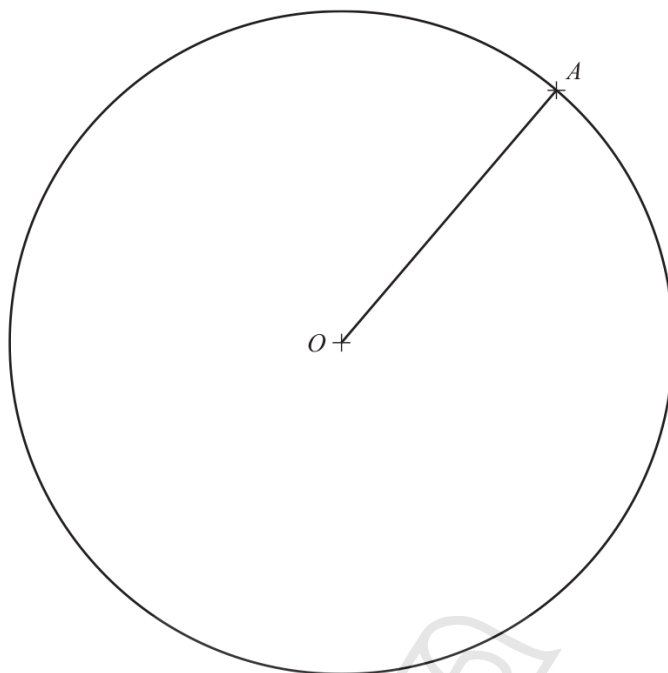
(b) z ,

Answer(b) $z =$ [1]

(c) t .

Answer(c) $t =$ [1]

160. 0580_P15_QP_20 Q: 9



The point A lies on the circle centre O , radius 5 cm.

(a) **Using a straight edge and compasses only**, construct the perpendicular bisector of the line OA . [2]

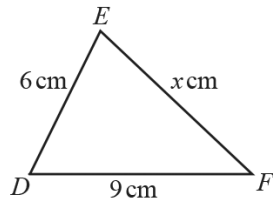
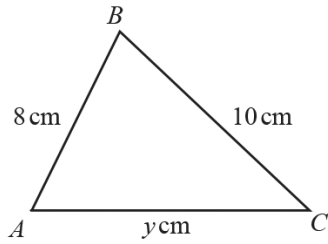
(b) The perpendicular bisector meets the circle at the points C and D .

Measure and write down the size of the angle AOD .

Answer(b) Angle $AOD =$ [1]

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161. 0580_s15_QP_21 Q: 19



NOT TO SCALE

Triangle ABC is similar to triangle DEF .

Calculate the value of

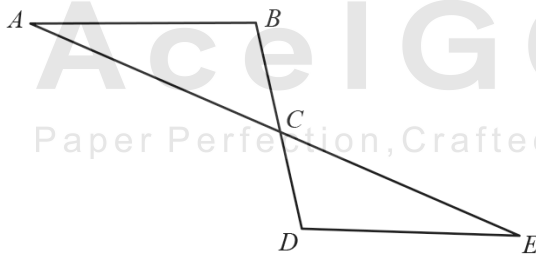
(a) x ,

Answer(a) $x = \dots\dots\dots$ [2]

(b) y .

Answer(b) $y = \dots\dots\dots$ [2]

162. 0580_s15_QP_22 Q: 7



NOT TO SCALE

The diagram shows two straight lines, AE and BD , intersecting at C .

Angle $ABC =$ angle EDC .

Triangles ABC and EDC are congruent.

Write down **two** properties of line segments AB and DE .

Answer AB and DE are $\dots\dots\dots$

and $\dots\dots\dots$ [2]

163. 0580_s15_QP_22 Q: 19

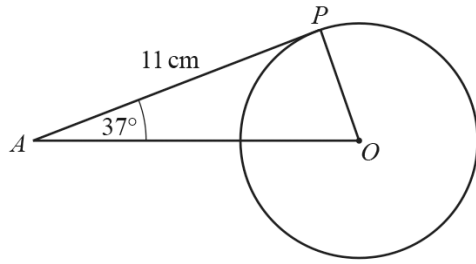
The diagram shows the positions of three points A , B and C .



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- (a) Draw the locus of points which are 4 cm from C . [1]
- (b) Using a straight edge and compasses only, construct the locus of points which are equidistant from A and B . [2]
- (c) Shade the region which is
- less than 4 cm from C
 - and
 - nearer to B than to A .
- [1]
-

164. 0580_w15_QP_21 Q: 8



NOT TO SCALE

In the diagram, AP is a tangent to the circle at P .
 O is the centre of the circle, angle $PAO = 37^\circ$ and $AP = 11$ cm.

(a) Write down the size of angle OPA .

Answer(a) Angle $OPA = \dots\dots\dots$ [1]

(b) Work out the radius of the circle.

Answer(b) $\dots\dots\dots$ cm [2]

165. 0580_w15_QP_22 Q: 2



Parallelogram



Trapezium



Rhombus

Write down which one of these shapes has

- rotational symmetry of order 2

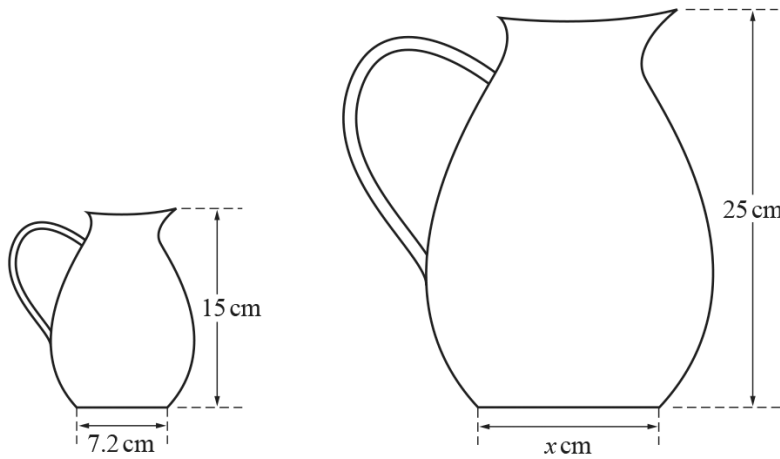
and

- no line symmetry.

Answer $\dots\dots\dots$ [1]

166. 0580_w15_QP_22 Q: 21

(a)



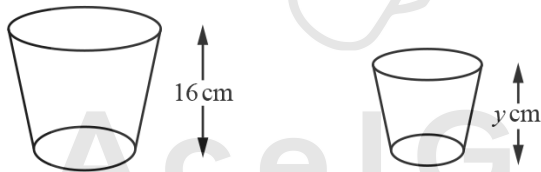
NOT TO SCALE

The diagram shows two jugs that are mathematically similar.

Find the value of x .

Answer(a) $x = \dots\dots\dots$ [2]

(b)



NOT TO SCALE

The diagram shows two glasses that are mathematically similar.
 The height of the larger glass is 16 cm and its volume is 375 cm^3 .
 The height of the smaller glass is $y \text{ cm}$ and its volume is 192 cm^3 .

Find the value of y .

Answer(b) $y = \dots\dots\dots$ [3]

167. 0580_w15_QP_23 Q: 8

Find the sum of the interior angles of a 25-sided polygon.

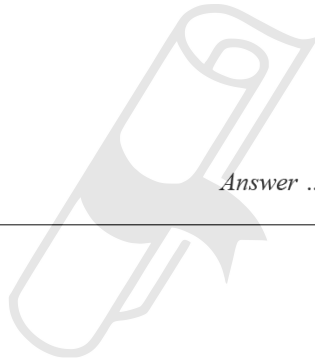
Answer [2]

168. 0580_w15_QP_23 Q: 14

Two containers are mathematically similar.
Their volumes are 54 cm^3 and 128 cm^3 .
The height of the smaller container is 4.5 cm.

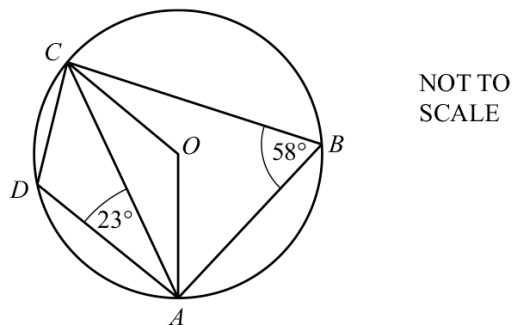
Calculate the height of the larger container.

Answer cm [3]



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169. 0580_s14_QP_21 Q: 13



A, B, C and D lie on a circle centre O .
Angle $ABC = 58^\circ$ and angle $CAD = 23^\circ$.

Calculate

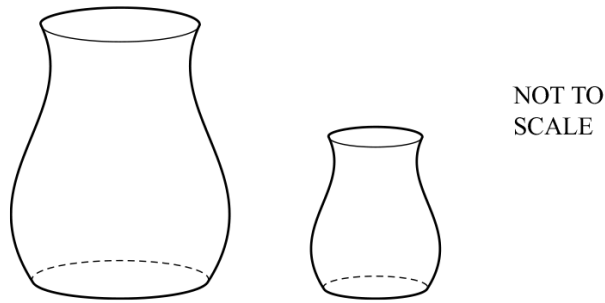
(a) angle OCA ,

Answer(a) Angle $OCA = \dots\dots\dots$ [2]

(b) angle DCA .

Answer(b) Angle $DCA = \dots\dots\dots$ [2]

170. 0580_s14_QP_22 Q: 18



The two containers are mathematically similar in shape.
The larger container has a volume of 3456 cm^3 and a surface area of 1024 cm^2 .
The smaller container has a volume of 1458 cm^3 .

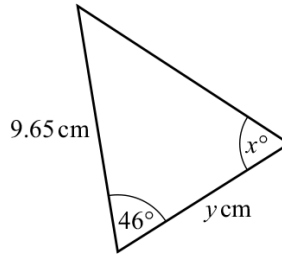
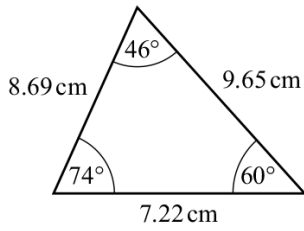
Calculate the surface area of the smaller container.



Answer cm^2 [4]

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171. 0580_s14_QP_23 Q: 7



NOT TO SCALE

These two triangles are congruent.
Write down the value of

(a) x ,

Answer(a) $x = \dots\dots\dots$ [1]

(b) y .

Answer(b) $y = \dots\dots\dots$ [1]

172. 0580_w14_QP_21 Q: 3

ZEBRA

Write down the letters in the word above that have

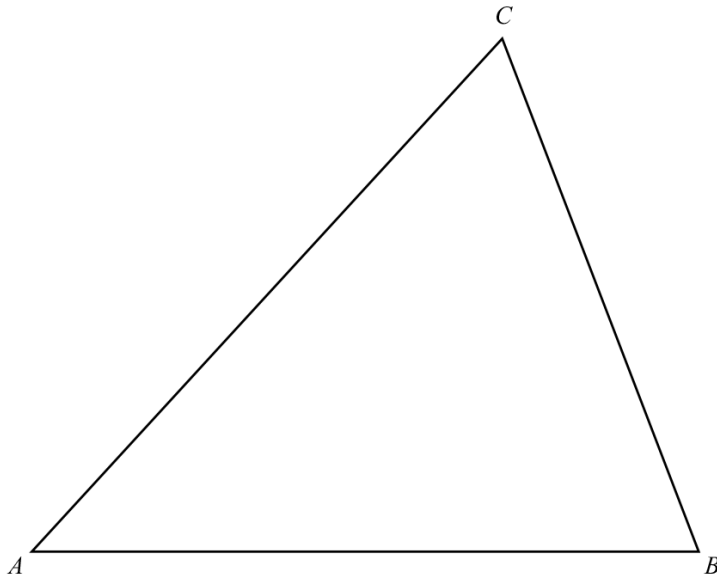
(a) exactly one line of symmetry,

Answer(a) $\dots\dots\dots$ [1]

(b) rotational symmetry of order 2.

Answer(b) $\dots\dots\dots$ [1]

173. 0580_w14_QP_21 Q: 15



(a) Using compasses and straight edge only, construct

(i) the perpendicular bisector of AC , [2]

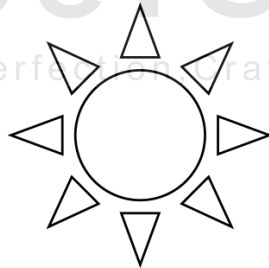
(ii) the bisector of angle ACB . [2]

(b) Shade the region inside the triangle which is

- nearer to A than to C
- and
- nearer to AC than to BC . [1]

174. 0580_w14_QP_22 Q: 3

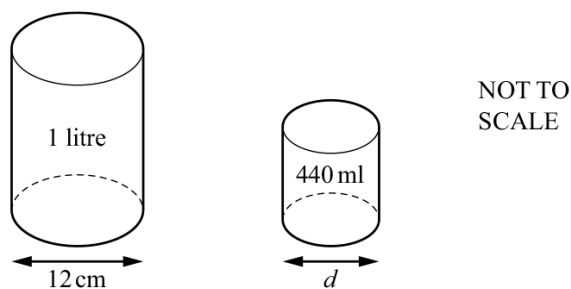
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Write down the order of rotational symmetry of this shape.

Answer [1]

175. 0580_w14_QP_22 Q: 9



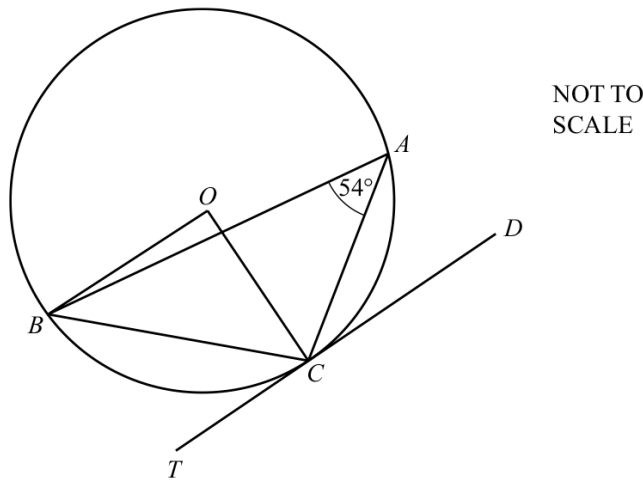
Two cylindrical cans are mathematically similar.

The larger can has a capacity of 1 litre and the smaller can has a capacity of 440 ml.

Calculate the diameter, d , of the 440 ml can.

Answer $d = \dots\dots\dots$ cm [3]

A, B and C are points on a circle, centre O .
 TC is a tangent to the circle.
 Angle $BAC = 54^\circ$.



- (a) Find angle BOC , giving a reason for your answer.

Answer(a) Angle $BOC = \dots\dots\dots$ because $\dots\dots\dots$
 $\dots\dots\dots$ [2]

- (b) When O is the origin, the position vector of point C is $\begin{pmatrix} 3 \\ -4 \end{pmatrix}$.

- (i) Work out the gradient of the radius OC .

Answer(b)(i) $\dots\dots\dots$ [1]

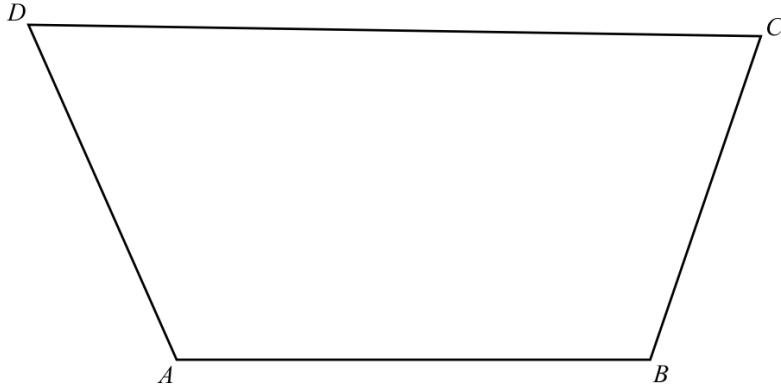
- (ii) D is the point $(7, k)$.

Find the value of k .

Answer(b)(ii) $k = \dots\dots\dots$ [1]

177. 0580_w14_QP_22 Q: 20

The diagram shows the plan, $ABCD$, of a park.
The scale is 1 centimetre represents 20 metres.



Scale: 1 cm to 20m

(a) Find the actual distance BC .

Answer(a) m [2]

(b) A fountain, F , is to be placed

- 160m from C
- and
- equidistant from AB and AD .

On the diagram, **using a ruler and compasses only**, construct and mark the position of F .
Leave in all your construction lines.

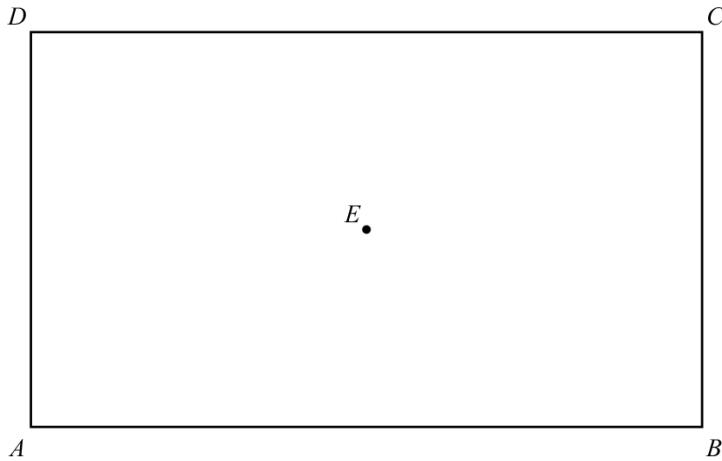
[5]

178. 0580_w14_QP_23 Q: 7

Find the interior angle of a regular polygon with 18 sides.

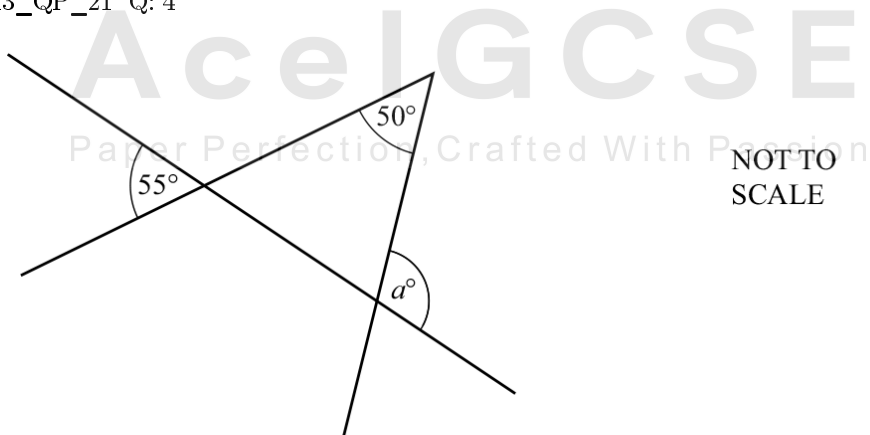
Answer [3]

179. 0580_w14_QP_23 Q: 12



- (a) Draw the locus of the points which are 3 cm from E . [1]
- (b) Using a straight edge and compasses only, construct the bisector of angle DCB . [2]
- (c) Shade the region which is
- less than 3 cm from E
 - and
 - nearer to CB than to CD .
- [1]

180. 0580_s13_QP_21 Q: 4



Use the information in the diagram to find the value of a .

Answer $a = \dots\dots\dots$ [2]

181. 0580_s13_QP_22 Q: 9

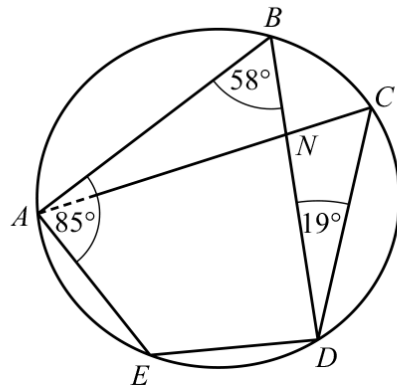
A car, 4.4 metres long, has a fuel tank which holds 65 litres of fuel when full.
The fuel tank of a mathematically similar model of the car holds 0.05 litres of fuel when full.

Calculate the length of the model car in centimetres.

Answer cm [3]



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NOT TO SCALE

A, B, C, D and E are points on a circle.
 Angle $ABD = 58^\circ$, angle $BAE = 85^\circ$ and angle $BDC = 19^\circ$.
 BD and CA intersect at N .

Calculate

(a) angle BDE ,

Answer(a) Angle $BDE = \dots\dots\dots$ [1]

(b) angle AND .

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Answer(b) Angle $AND = \dots\dots\dots$ [2]

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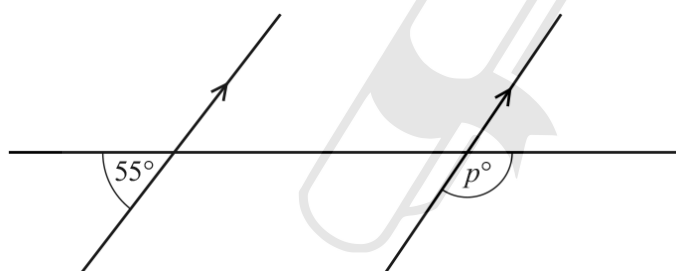
183. 0580_s13_QP_23 Q: 6

The volumes of two similar cones are $36\pi \text{ cm}^3$ and $288\pi \text{ cm}^3$.
The base radius of the smaller cone is 3 cm.

Calculate the base radius of the larger cone.

Answer cm [3]

184. 0580_w13_QP_21 Q: 3



NOT TO
SCALE

Find the value of p .

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Answer $p =$ [2]

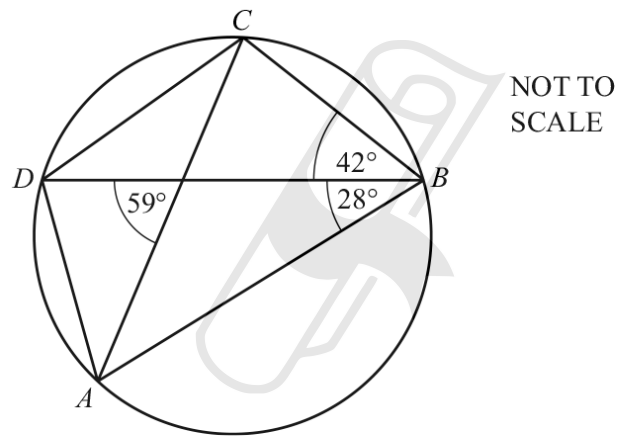
185. 0580_w13_QP_21 Q: 11

The volume of a child's model plane is 1200 cm^3 .
The volume of the full size plane is 4050 m^3 .

Find the scale of the model in the form $1:n$.

Answer 1: [3]

186. 0580_w13_QP_21 Q: 12



A, B, C and D lie on the circle.

Find

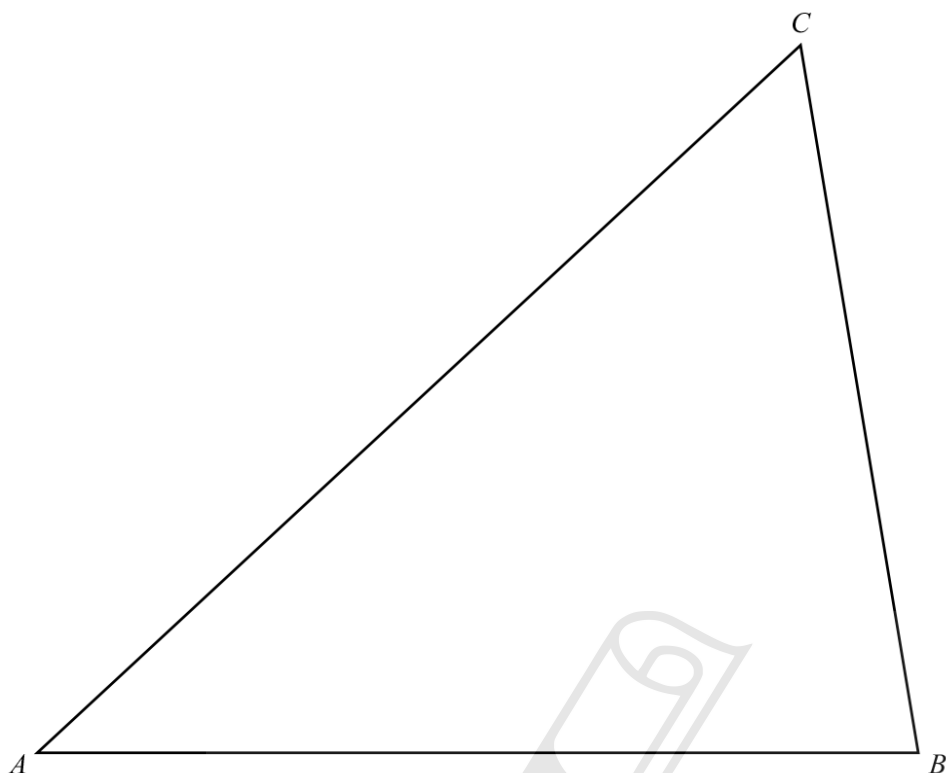
(a) angle ADC ,

Answer(a) Angle $ADC =$ [1]

(b) angle ADB .

Answer(b) Angle $ADB =$ [2]

187. 0580_w13_QP_21 Q: 20



(a) In this part, use a straight edge and compasses only and show your construction arcs.

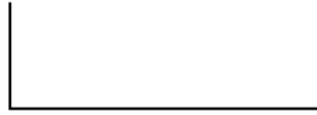
Construct accurately

- (i)** the bisector of angle B , [2]
- (ii)** the locus of points equidistant from B and from C . [2]

(b) Shade the region inside triangle ABC containing the points which are
 nearer to BC than to BA **and** nearer to C than to B . [1]

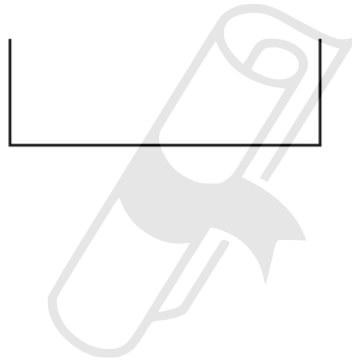
188. 0580_w13_QP_22 Q: 5

(a) Add **one** line to the diagram so that it has two lines of symmetry.



[1]

(b) Add **two** lines to the diagram so that it has rotational symmetry of order 2.



[1]

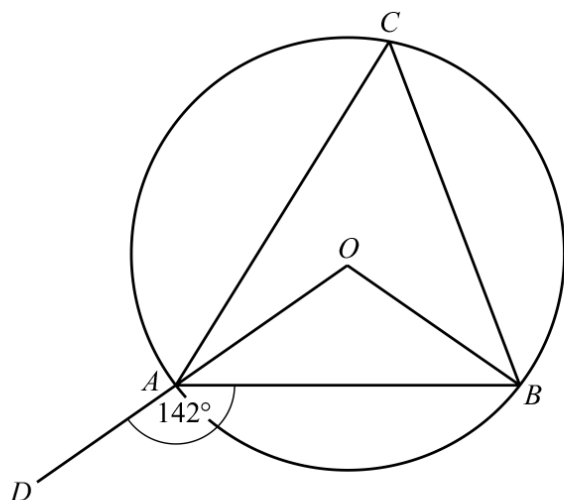
189. 0580_w13_QP_22 Q: 9

The exterior angle of a regular polygon is 36° .

What is the name of this polygon?

Answer [3]

190. 0580_w13_QP_22 Q: 14

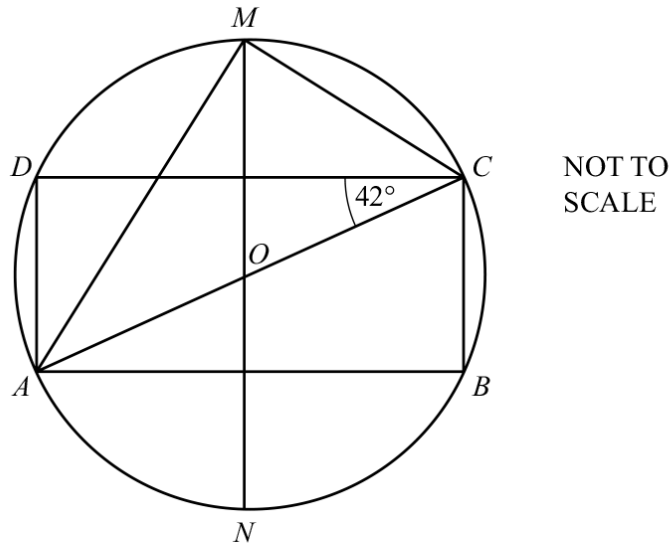


NOT TO
SCALE

A , B and C are points on the circumference of a circle centre O .
 OAD is a straight line and angle $DAB = 142^\circ$.

Calculate the size of angle ACB .

Answer Angle $ACB = \dots\dots\dots$ [3]



The vertices of the rectangle $ABCD$ lie on a circle centre O .
 MN is a line of symmetry of the rectangle.
 AC is a diameter of the circle and angle $ACD = 42^\circ$.

Calculate

- (a) angle CAM ,

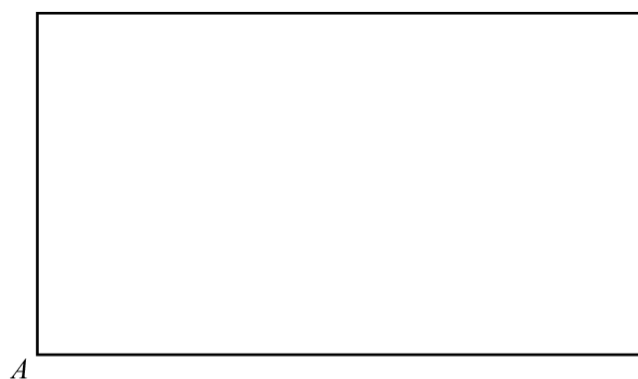
Answer(a) Angle $CAM = \dots\dots\dots$ [2]

- (b) angle DCM .

Answer(b) Angle $DCM = \dots\dots\dots$ [2]

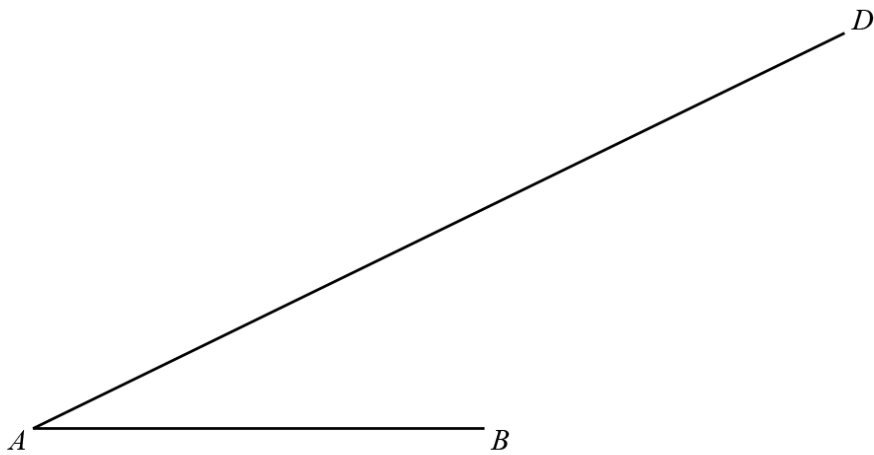


192. 0580_w13_QP_23 Q: 15



- (a) Construct the locus of all the points which are 3 cm from vertex A **and** outside the rectangle. [2]
- (b) Construct, **using a straight edge and compasses only**, one of the lines of symmetry of the rectangle. [2]
-

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- (a) The point C lies on AD and angle $ABC = 67^\circ$.

Draw accurately the line BC .

[1]

- (b) Using a straight edge and compasses only, construct the perpendicular bisector of AB . Show clearly all your construction arcs.

[2]

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194. 0580_s12_QP_22 Q: 2

TRIGONOMETRY

From the above word, write down the letters which have

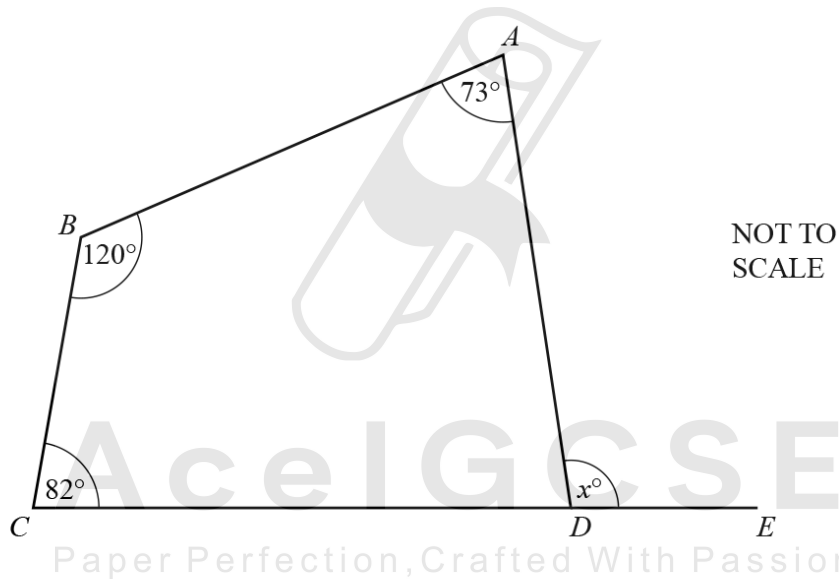
(a) exactly two lines of symmetry,

Answer(a) [1]

(b) rotational symmetry of order 2.

Answer(b) [1]

195. 0580_s12_QP_23 Q: 1



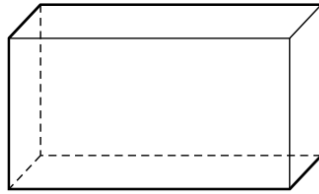
The diagram shows a quadrilateral $ABCD$.
 CDE is a straight line.

Calculate the value of x .

Answer $x =$ [2]

196. 0580_w12_QP_21 Q: 3

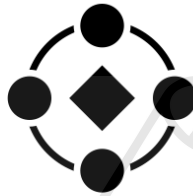
(a) The diagram shows a cuboid.



How many planes of symmetry does this cuboid have?

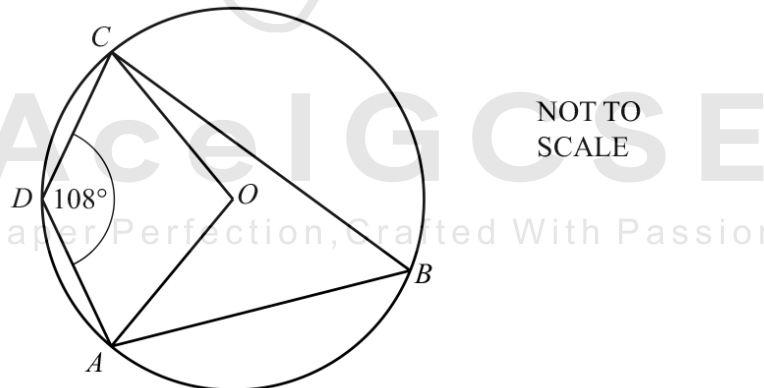
Answer(a) [1]

(b) Write down the order of rotational symmetry for the following diagram.



Answer(b) [1]

197. 0580_w12_QP_21 Q: 6

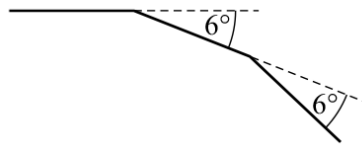


A, B, C and D lie on a circle centre O . Angle $ADC = 108^\circ$.

Work out the obtuse angle AOC .

Answer Angle $AOC =$ [2]

198. 0580_w12_QP_22 Q: 4

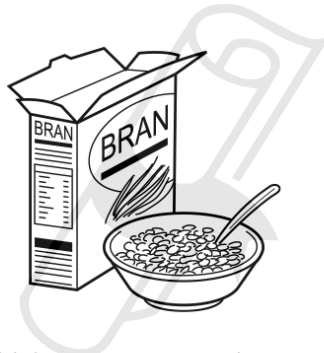


NOT TO SCALE

The diagram shows two of the exterior angles of a regular polygon with n sides. Calculate n .

Answer $n =$ [2]

199. 0580_w12_QP_22 Q: 12



A company sells cereals in boxes which measure 10 cm by 25 cm by 35 cm.

They make a special edition box which is mathematically similar to the original box.

The volume of the special edition box is $15\,120\text{ cm}^3$.

Work out the dimensions of this box.

Answer cm by cm by cm [3]

200. 0580_w12_QP_23 Q: 6

$\times R$

$T \times$

Using a straight edge and compasses only, construct the locus of points which are equidistant from R and from T . [2]

201. 0580_w12_QP_23 Q: 15

A model of a ship is made to a scale of 1 : 200.
The surface area of the model is 7500 cm².

Calculate the surface area of the ship, giving your answer in square metres.


AcedGCSE Answer m² [3]
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