1. Nov/2020/Paper_11/No.1

Write down the mathematical name for

(a) an angle which is less than 90°,

..... [1]

(b) a polygon with 5 sides,

..... [1]

(c) a quadrilateral with exactly one pair of parallel sides.

..... [1]

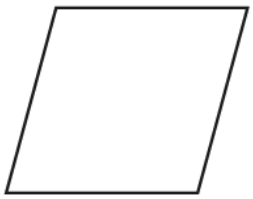
2. Nov/2020/Paper_11/No.2

hexagon perpendicular isosceles
regular congruent

Put a ring around the word that describes two polygons that are the same shape and size. [1]

3. Nov/2020/Paper_11/No.5

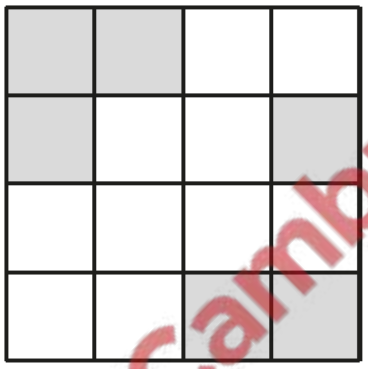
(a)



The diagram shows a rhombus.

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

(b)



Shade two squares so that the diagram has rotational symmetry of order 2. [1]

4. Nov/2020/Paper_11/No.8

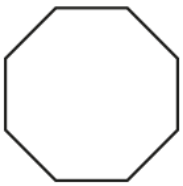
A field, ABC, is in the shape of a triangle.
$AC = 500$ m and $BC = 650$ m.

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]

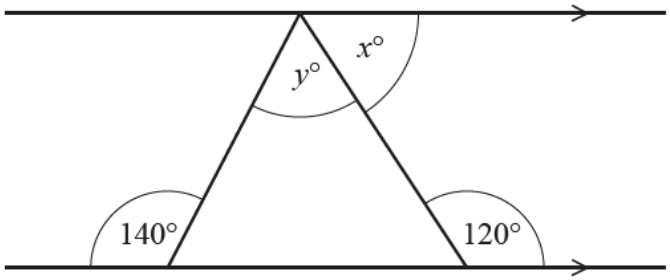
5. Nov/2020/Paper_12/No.3



Write down the order of rotational symmetry of this regular octagon.

..... [1]

6. Nov/2020/Paper_12/No.10



NOT TO SCALE

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

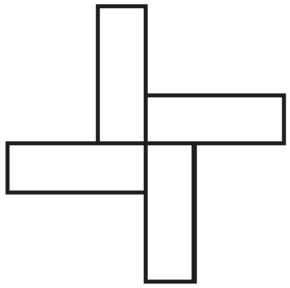
Find the value of x and the value of y.

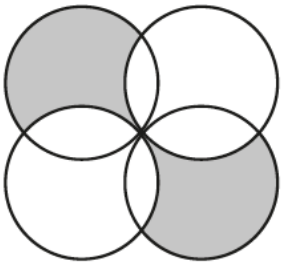
$x =$ .....

$y =$ ..... [3]

7. Nov/2020/Paper_13/No.4

Write down the order of rotational symmetry of each shape.





....

[2]

8. Nov/2020/Paper_13/No.6

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.

[2]

9. Nov/2020/Paper_13/No.19

A regular polygon has an exterior angle of 20°.

Work out the number of sides of this polygon.

..... [1]

10. Nov/2020/Paper_21/No.2

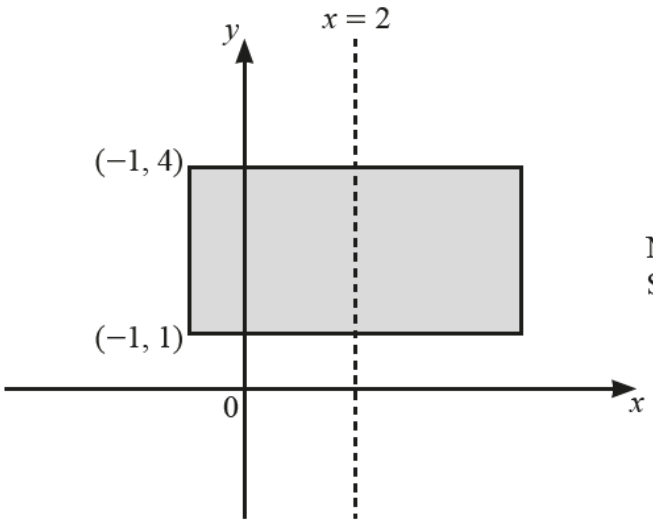
A field, ABC, is in the shape of a triangle.
$AC = 500\,\text{m}$ and $BC = 650\,\text{m}$.

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]

11. Nov/2020/Paper_21/No.11



NOT TO SCALE

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 $a \leqslant x \leqslant b$ and $c \leqslant y \leqslant d$.

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

$a =$ .....

$b =$ .....

$c =$ .....

$d =$ ..... [2]

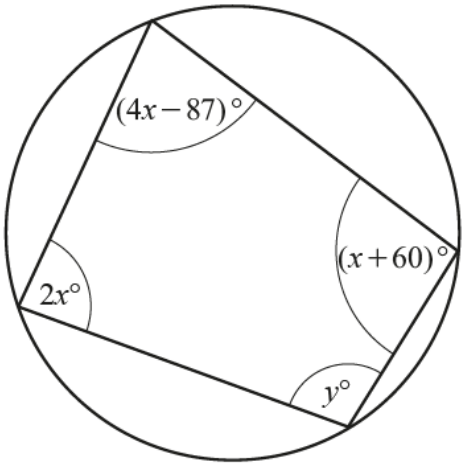
12. Nov/2020/Paper_21/No.12

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

Work out the value of n.

$n =$ ..... [2]

13. Nov/2020/Paper_21/No.20



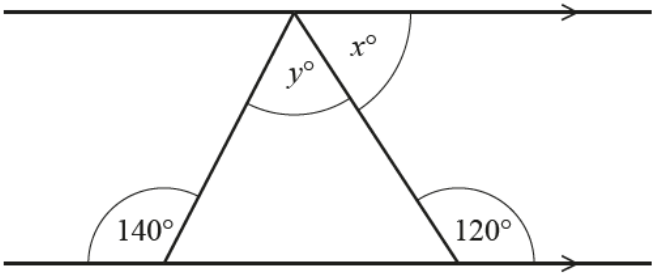
NOT TO SCALE

The diagram shows a cyclic quadrilateral.

Find the value of y.

$y =$ ..... [4]

14. Nov/2020/Paper_22/No.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.

$x =$ .....

$y =$ ..... [3]

15. Nov/2020/Paper_22/No.8

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

..... [2]

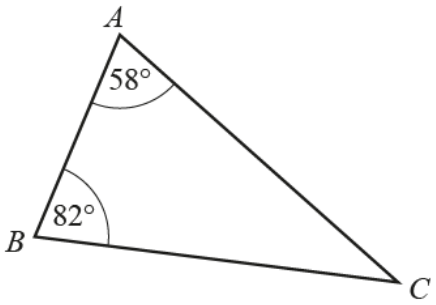
16. Nov/2020/Paper_23/No.3

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.

[2]

17. Nov/2020/Paper_23/No.6



NOT TO SCALE

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

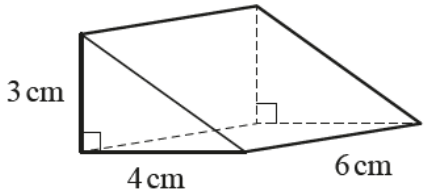
(a) Write down the mathematical name of the quadrilateral $ABDC$.

..... [1]

(b) Find angle ACD.

Angle ACD = ... [2]

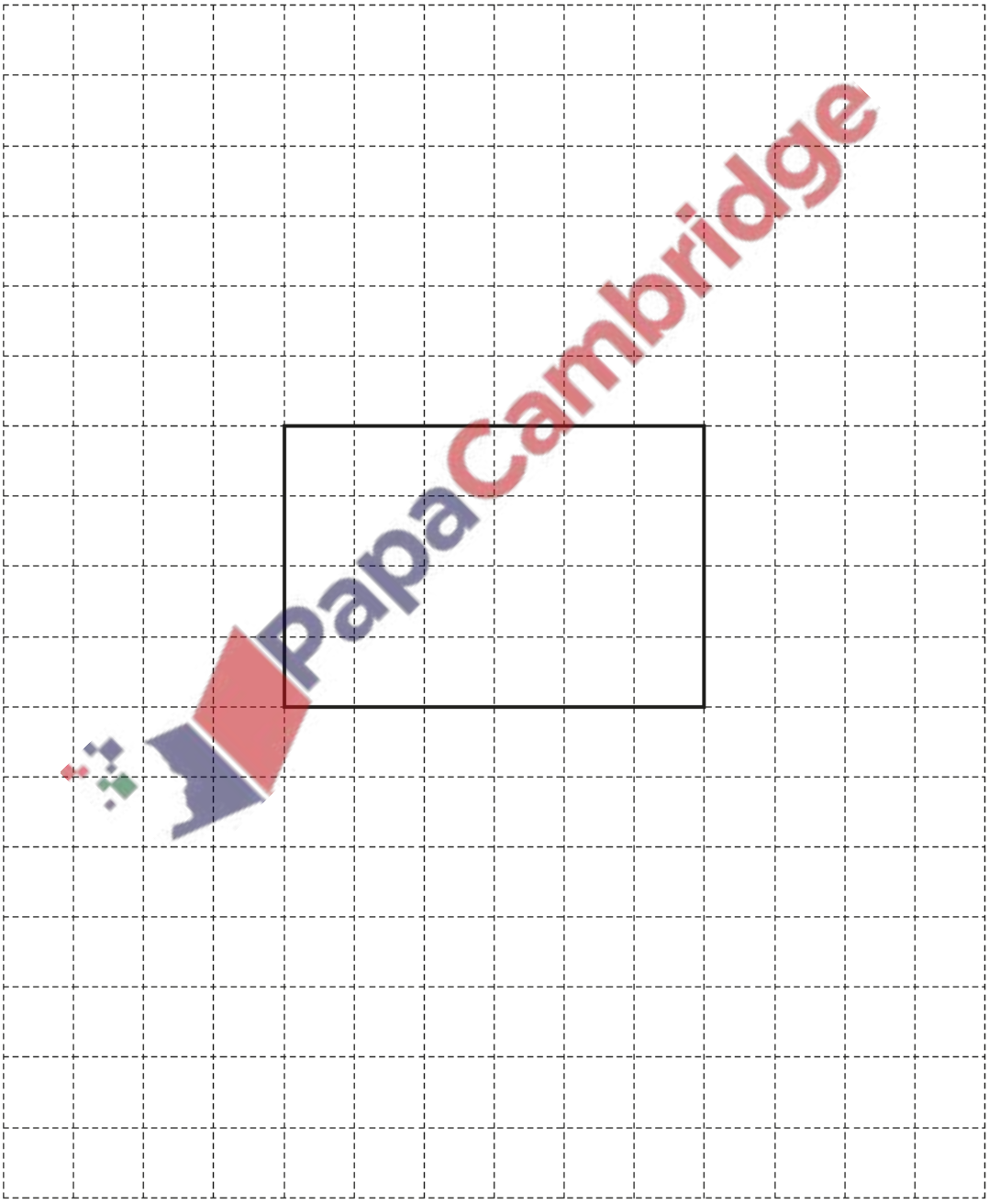
18. Nov/2020/Paper_31/No.6



NOT TO SCALE

The diagram shows a right-angled triangular prism.

(a) On the 1 cm^2 grid, complete the net of the prism.
One face has been drawn for you.



[3]

(b) Work out the surface area of the prism.

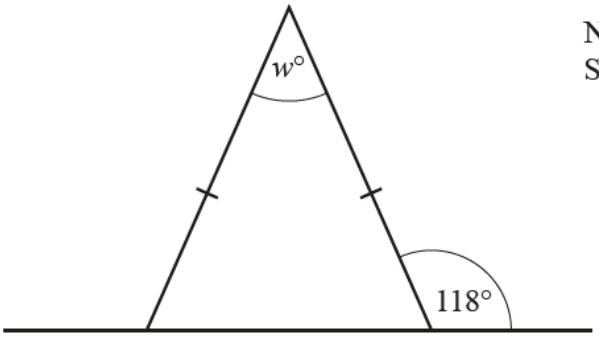
..... cm^2 [3]

(c) Work out the volume of the prism.

..... cm^3 [2]

19. Nov/2020/Paper_31/No.7

(a)



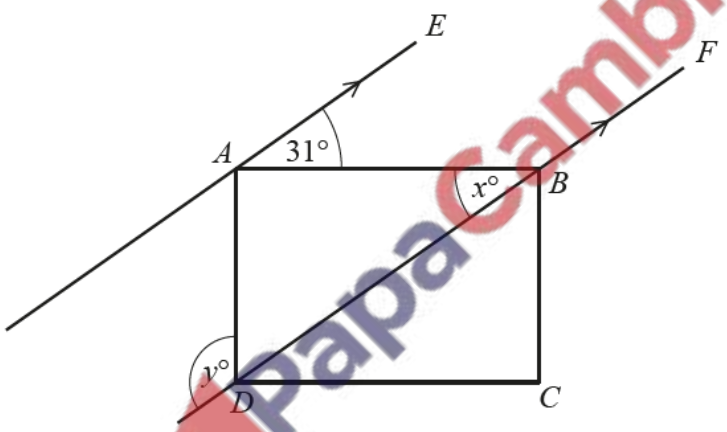
NOT TO SCALE

The diagram shows an isosceles triangle and a straight line.

Work out the value of w.

$w =$ ..... [2]

(b)



NOT TO SCALE

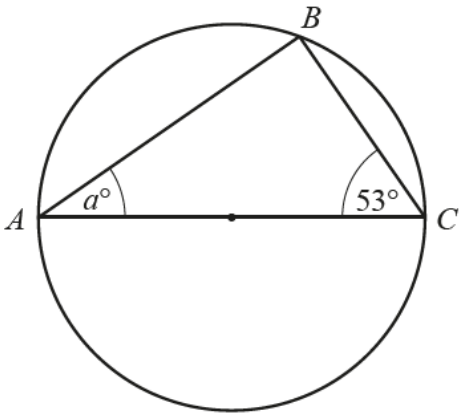
$ABCD$ is a rectangle.
AE is parallel to DBF.

Find the value of x and the value of y.

$x =$ .....

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

(c)



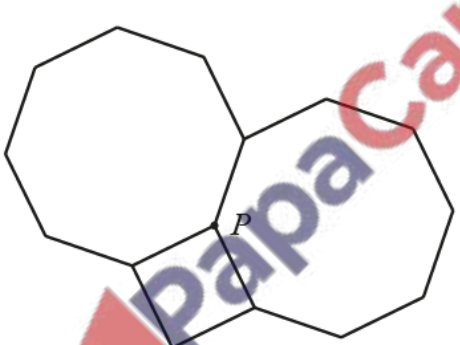
NOT TO SCALE

A, B and C are points on a circle.
AC is a diameter of the circle.

Find the value of a.

$a =$ ..... [2]

(d)



NOT TO SCALE

Two regular octagons and a square meet at point P.

Show, by calculation, that the three interior angles at P add up to 360°.

[3]

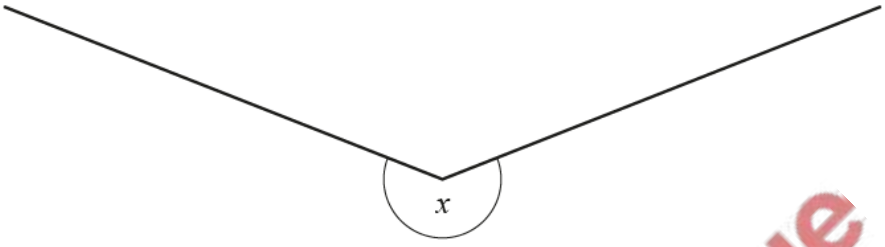
20. Nov/2020/Paper_32/No.2

(a)

Measure the length of this line in millimetres.

..... mm [1]

(b)



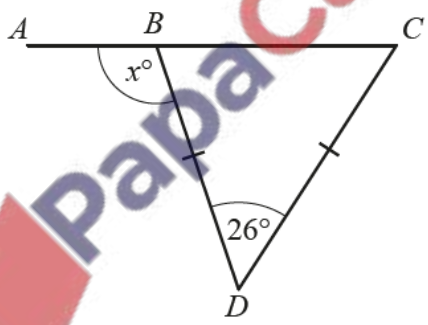
(i) Measure the size of angle x.

..... [1]

(ii) Write down the mathematical name of this type of angle.

..... [1]

(c)



NOT TO SCALE

ABC is a straight line and BCD is an isosceles triangle.

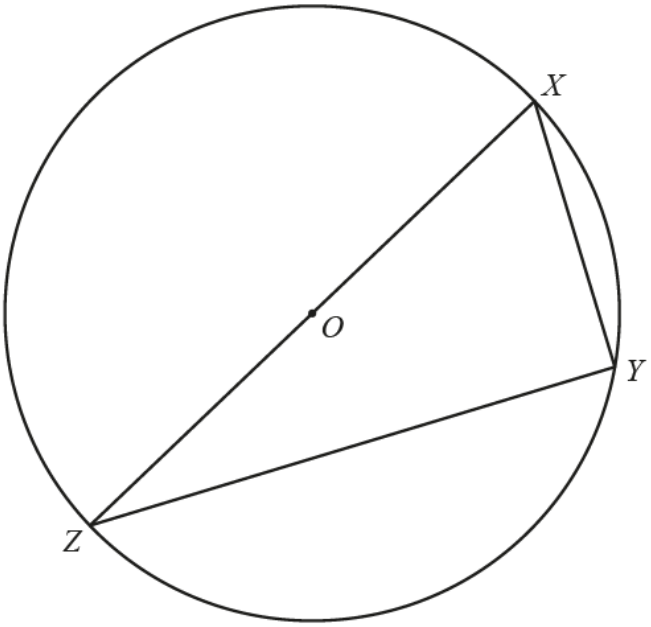
Find the value of x.

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

(d) Work out the size of one interior angle of a regular 16-sided polygon.

..... [2]

(e)



NOT TO SCALE

(i) Complete this statement.

X, *Y* and *Z* are points on the ..... of the circle, centre *O*. [1]

(ii) Give a reason why angle *XYZ* is 90°.

..... [1]

(f) A circle has diameter 6 cm.

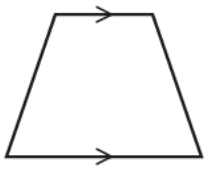
Calculate the area of the circle.
Give the units of your answer.

.... [3]

21. Nov/2020/Paper_32/No.3

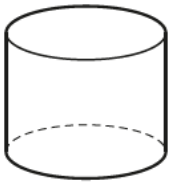
(a) Write down the mathematical name for this

(i) quadrilateral,



..... [1]

(ii) solid.



..... [1]

(b) The area of a square is $64\,cm^2$.

Work out the length of one side of the square.

..... cm [1]

(c) The length, l, of a rectangle is 3 cm longer than the width, w.
The perimeter of the rectangle is 26 cm.

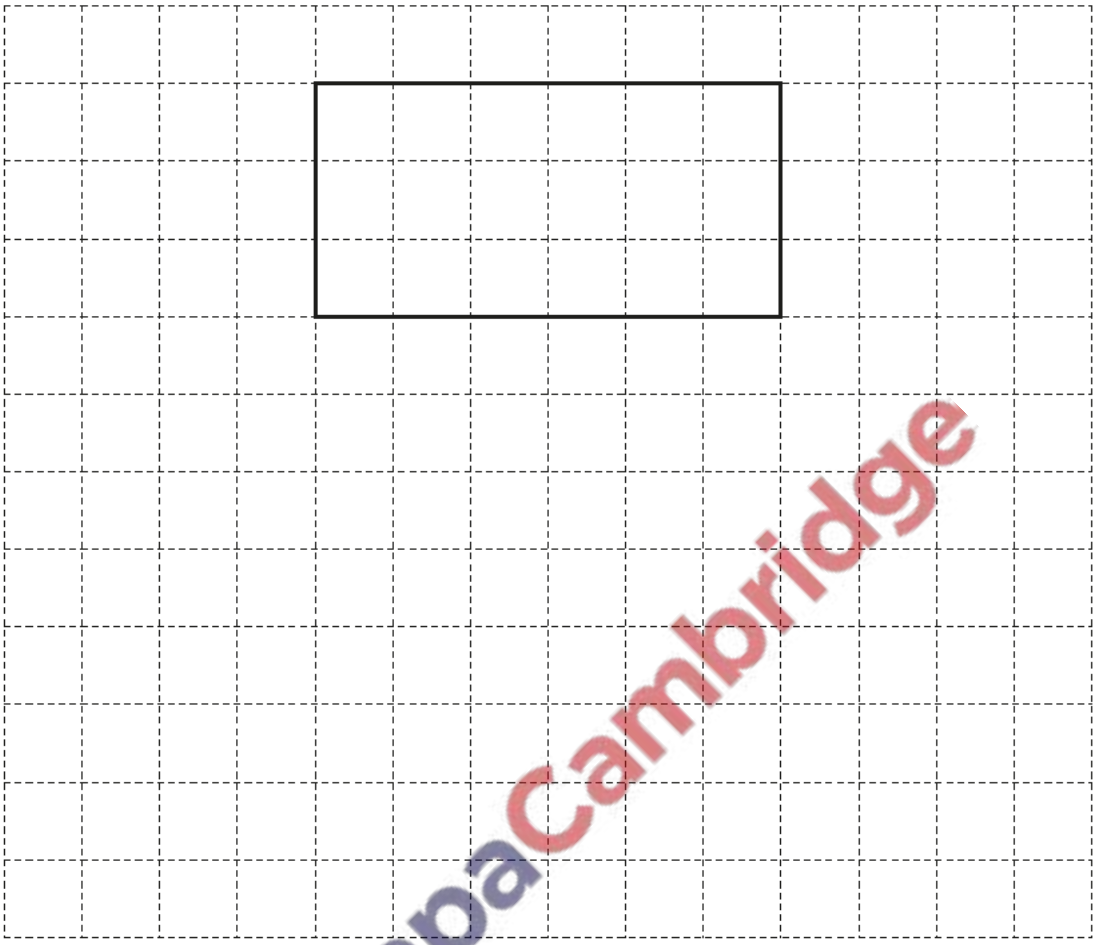
Calculate the length, l, and the width, w.

l = ... cm

w = ... cm [3]

(d) A cuboid measures 6 cm by 3 cm by 1 cm.

(i) On the 1 cm^2 grid, draw an accurate net of this cuboid.
One face has been drawn for you.



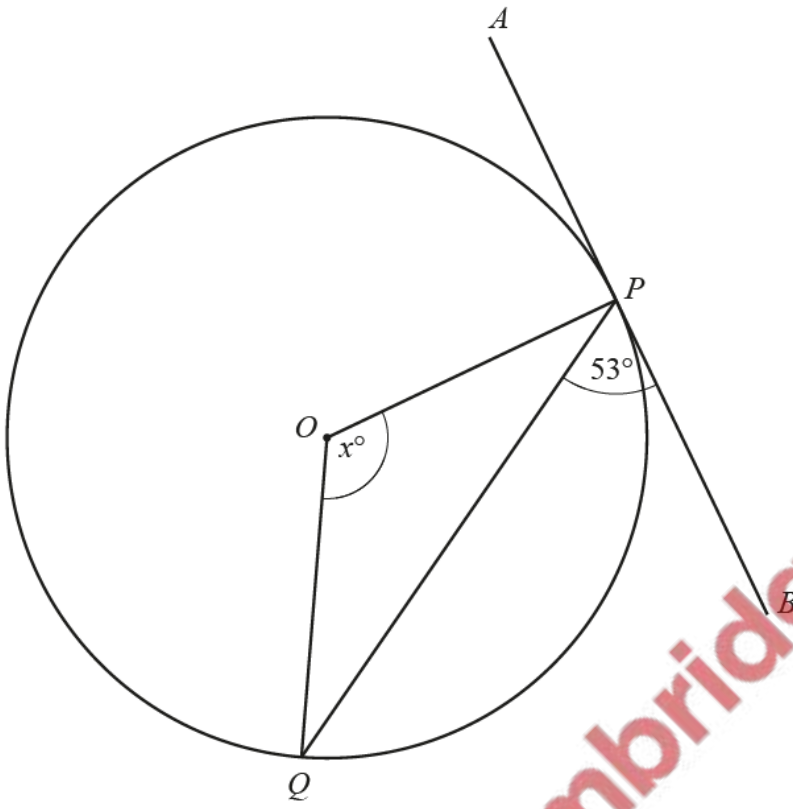
[3]

(ii) Calculate the surface area of the cuboid.

..... cm^2 [2]

22. Nov/2020/Paper_33/No.8

(a)



P and Q are points on the circle, centre O.
APB is a tangent to the circle at P.

(i) Write down the mathematical name for the line PQ.

..... [1]

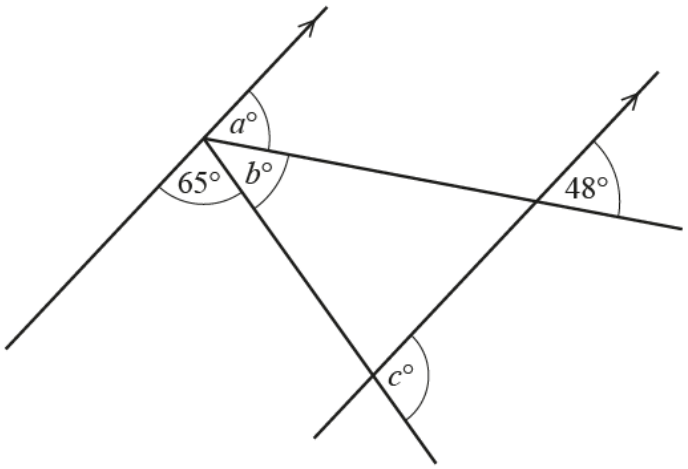
(ii) Explain why angle OPB is 90°.

..... [1]

(iii) Find the value of x.

$x =$ ..... [3]

(b)



NOT TO SCALE

The diagram shows two parallel lines and two straight lines.

(i) Find the value of a.
Give a reason for your answer.

$a =$ ..... because ..... [2]

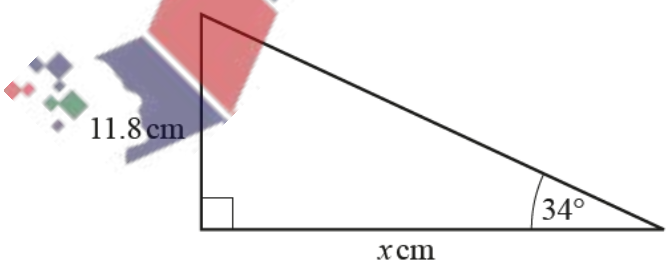
(ii) Find the value of b.
Give a reason for your answer.

$b =$ ..... because ..... [2]

(iii) Find the value of c.

$c =$ ..... [2]

(c)



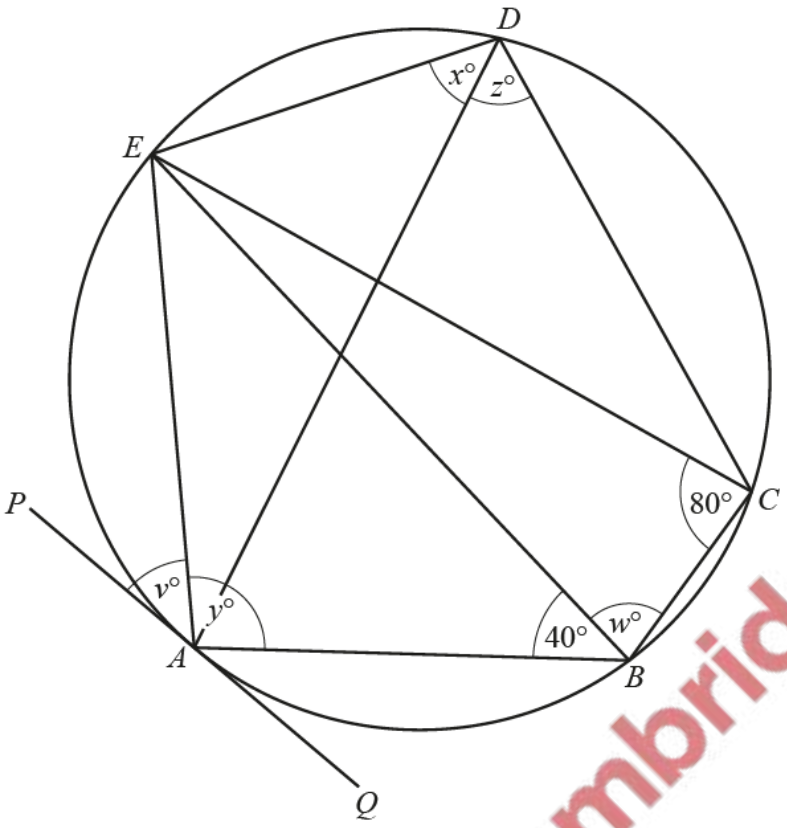
NOT TO SCALE

Calculate the value of x.

$x =$ ..... [3]

23. Nov/2020/Paper_42/No.8

(a)

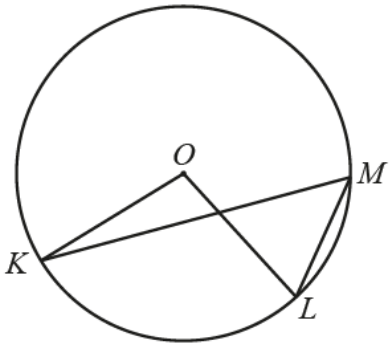


The points A, B, C, D and E lie on the circle.
PAQ is a tangent to the circle at A and $EC = EB$.
Angle $ECB = 80°$ and angle $ABE = 40°$.

Find the values of v, w, x, y and z.

$v =$ ..... $w =$ ..... $x =$ ..... $y =$ ..... $z =$ ..... [5]

(b)



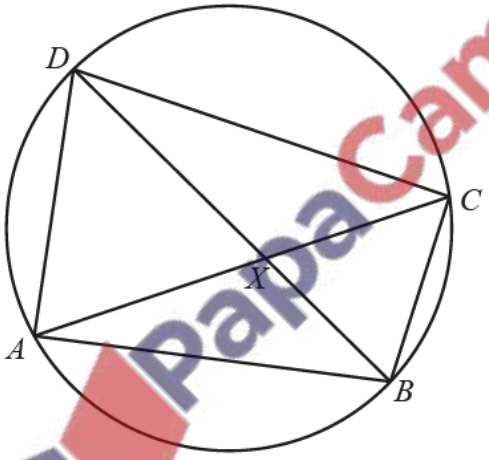
NOT TO SCALE

In the diagram, K, L and M lie on the circle, centre O.
Angle $KML = 2x°$ and reflex angle $KOL = 11x°$.

Find the value of x.

$x =$ ..... [3]

(c)



NOT TO SCALE

The diagonals of the cyclic quadrilateral $ABCD$ intersect at X.

(i) Explain why triangle ADX is similar to triangle BCX.
Give a reason for each statement you make.

.....

.....

.....

..... [3]

(ii) $AD = 10\,\text{cm}$, $BC = 8\,\text{cm}$, $BX = 5\,\text{cm}$ and $CX = 7\,\text{cm}$.

(a) Calculate DX.

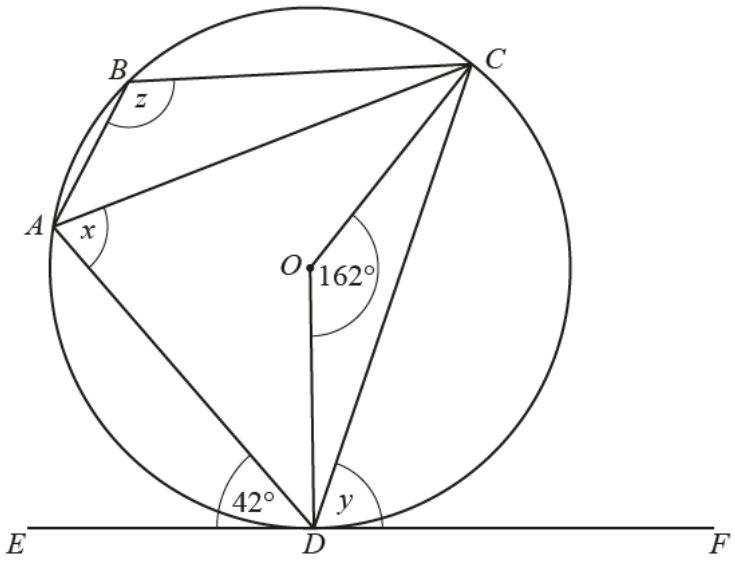
$DX =$ ..... cm [2]

(b) Calculate angle BXC.

Angle $BXC =$ ..... [4]

24. Nov/2020/Paper_43/No.5

(a)



NOT TO SCALE

A, B, C and D are points on the circle, centre O.
EF is a tangent to the circle at D.
Angle $ADE = 42°$ and angle $COD = 162°$.

Find the following angles, giving reasons for each of your answers.

(i) Angle x

$x =$ ..... because .....

..... [2]

(ii) Angle y

$y =$ ..... because .....

..... [2]

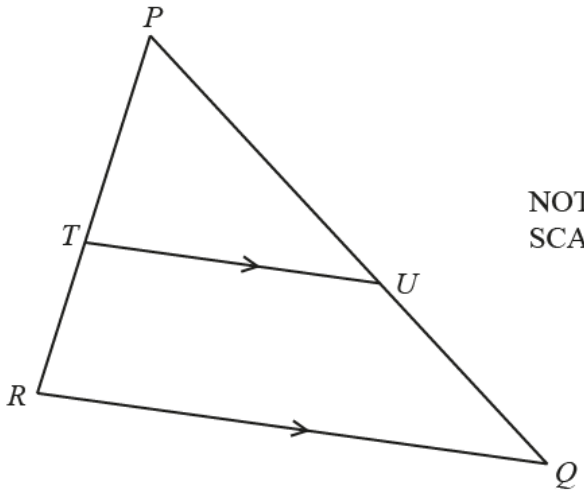
(iii) Angle z

$z =$ ..... because .....

.....

..... [3]

(b)



NOT TO SCALE

PQR is a triangle.
T is a point on PR and U is a point on PQ.
RQ is parallel to TU.

(i) Explain why triangle PQR is similar to triangle PUT.
Give a reason for each statement you make.

.....

.....

.....

..... [3]

(ii) $PT : TR = 4 : 3$

(a) Find the ratio $PU : PQ$.

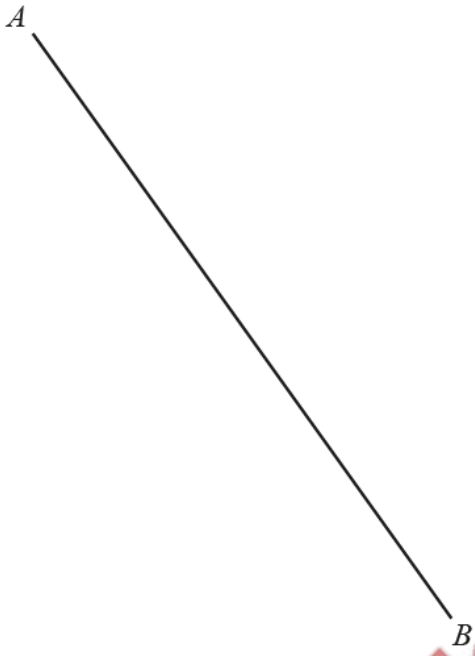
..... : ..... [1]

(b) The area of triangle PUT is $20\,\text{cm}^2$.

Find the area of the quadrilateral $QRTU$.

..... cm^2 [3]

25. March/2020/Paper_12/No.2



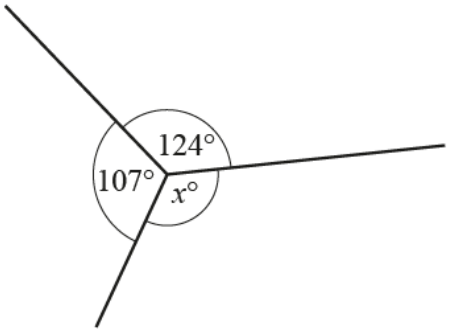
(a) Measure the length of the line AB in millimetres.

..... mm [1]

(b) AB is the diameter of a circle.

Draw this circle. [2]

26. March/2020/Paper_12/No.4



NOT TO SCALE

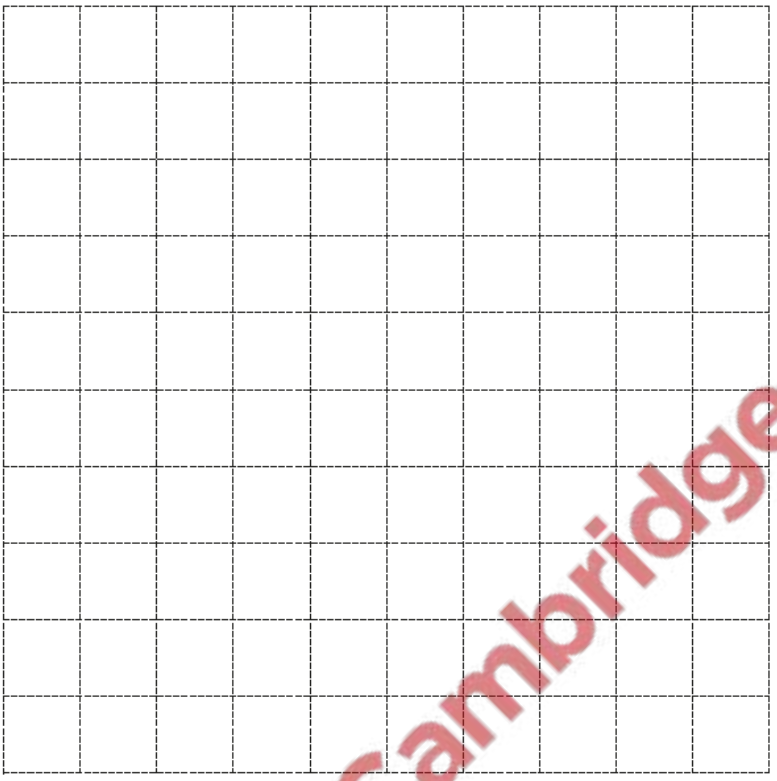
Work out the value of x.
Give a geometrical reason for your answer.

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

27. March/2020/Paper_12/No.7

A cuboid has length 3 cm, width 2 cm and height 1 cm.

On the 1 cm^2 grid, draw a net of the cuboid.



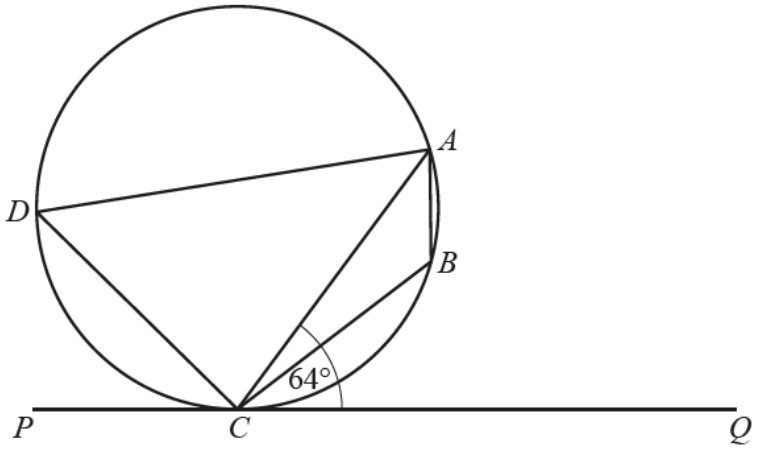
[3]

28. March/2020/Paper_22/No.4

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

..... [2]

29. March/2020/Paper_22/No.15



NOT TO SCALE

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

Work out angle ABC, giving reasons for your answer.

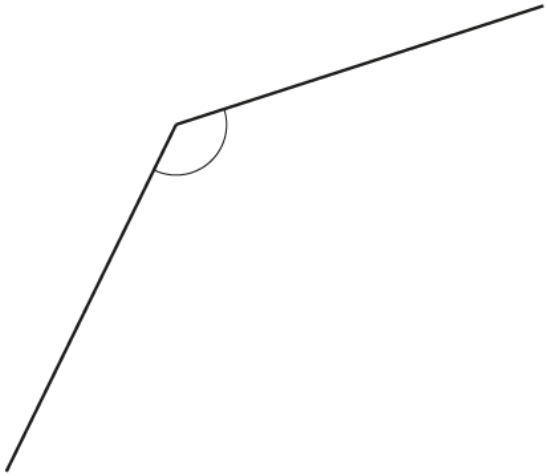
Angle ABC = ... because .....

.....

..... [3]

30. March/2020/Paper_32/No.3

(a)



(i) Write down the mathematical name for this type of angle.

..... [1]

(ii) Measure this angle.

..... [1]

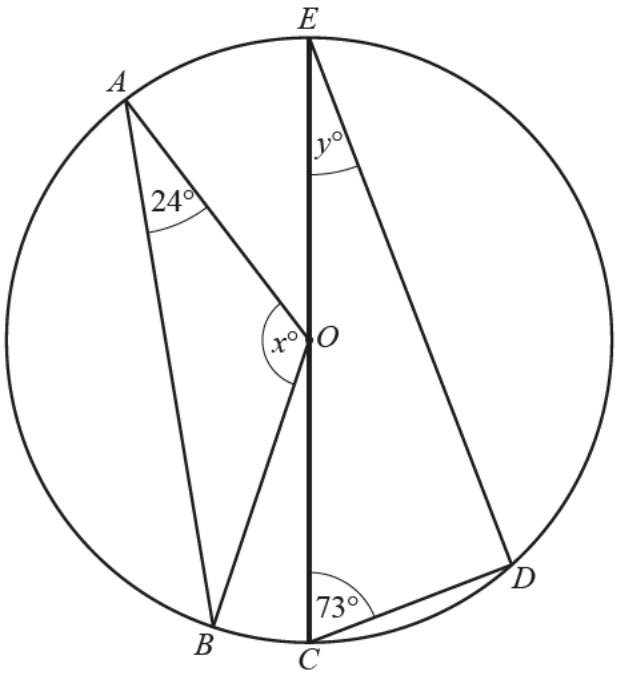
(b) **(i)** Write down the mathematical name for an 8-sided polygon.

..... [1]

(ii) Work out the size of an interior angle of a regular 24-sided polygon.

..... [2]

(c)



NOT TO SCALE

The diagram shows a circle, centre O, with diameter CE.
A, B, C, D and E lie on the circumference of the circle.

(i) Find the value of x.
Give a reason for your answer.

$x =$ ..... because ..... [3]

(ii) Find the value of y.
Give a reason for your answer.

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

(iii) Draw a tangent to the circle at A. [1]

31. March/2020/Paper_32/No.7

(a) The scale drawing shows the positions of a rock, R, and a statue, S, on a map.
The scale is 1 centimetre represents 6 metres.

Scale: 1 cm to 6 m

(i) Work out the actual distance between R and S.

..... m [2]

(ii) A flagpole, F, is on a bearing of 164° from S.

Work out the bearing of S from F.

..... [2]

(iii) Ishaan uses the map to find some treasure, T.
T is on a bearing of 076° from R and on a bearing of 337° from S.

Mark the position of T on the map.

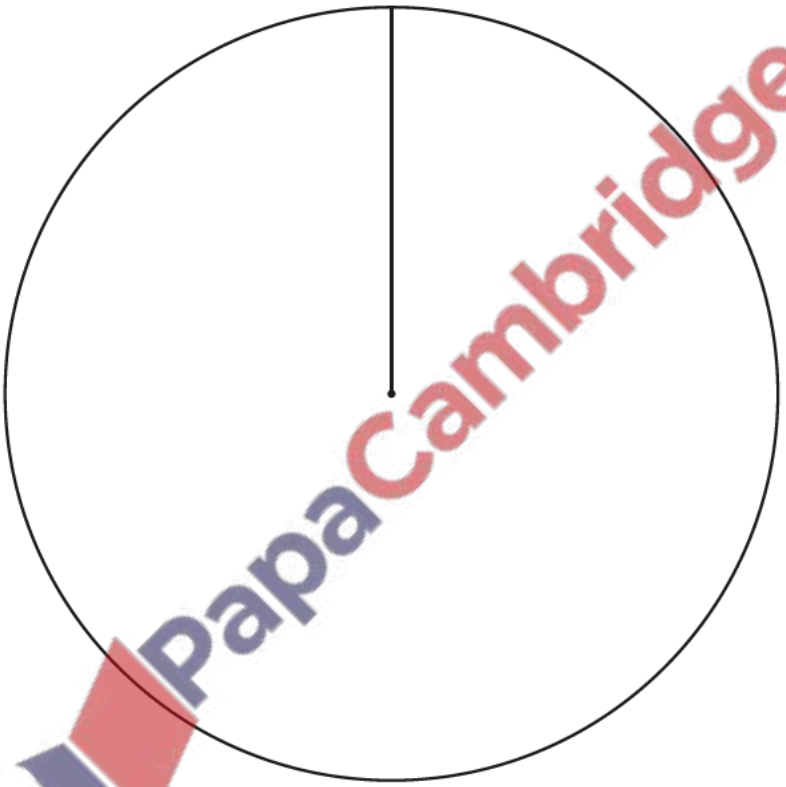
[2]

(b) The treasure is a bag of coins.
The coins are made from three different metals.

Metal	Percentage	Pie chart sector angle
Copper	70%	
Zinc	20%	
Tin	10%	

(i) Complete the table. [2]

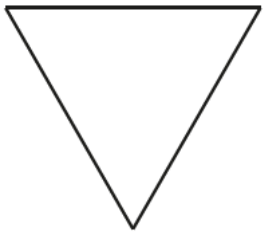
(ii) Complete the pie chart.

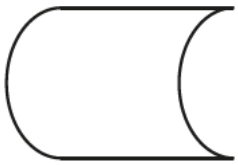


[2]

32. June/2020/Paper_11/No.4

(a)





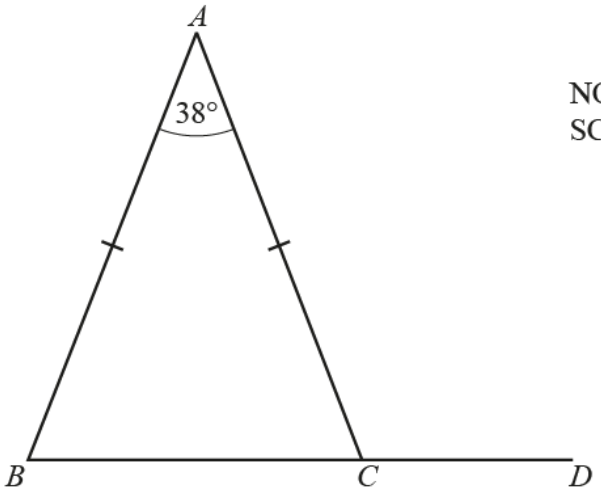
On each shape draw all the lines of symmetry. [3]

(b)

Write down the order of rotational symmetry of this shape.

..... [1]

33. June/2020/Paper_11/No.5



NOT TO SCALE

In the triangle ABC, $AB = AC$ and angle $BAC = 38°$.
BCD is a straight line.

Work out angle ACD.

Angle ACD = ... [3]

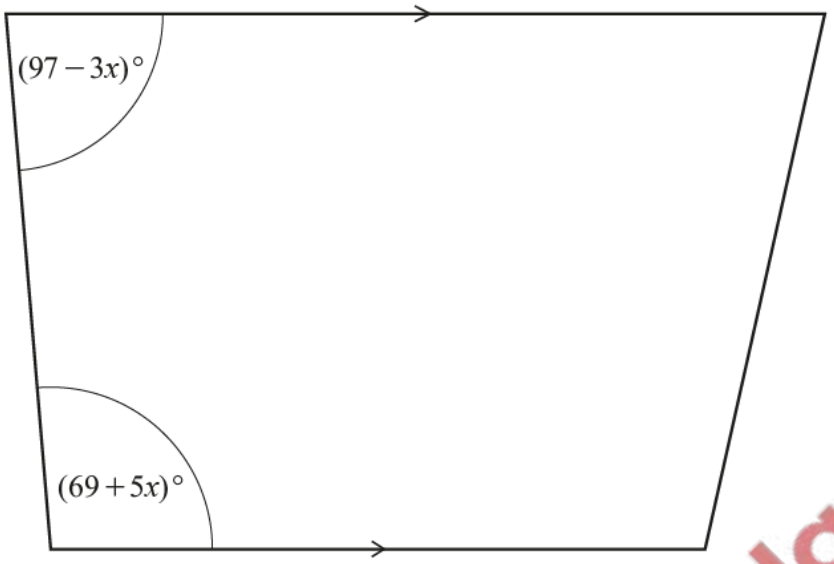
34. June/2020/Paper_11/No.10

Work out the size of one interior angle of a regular 9-sided polygon.

..... [2]

35. June/2020/Paper_11/No.14

The diagram shows a trapezium.

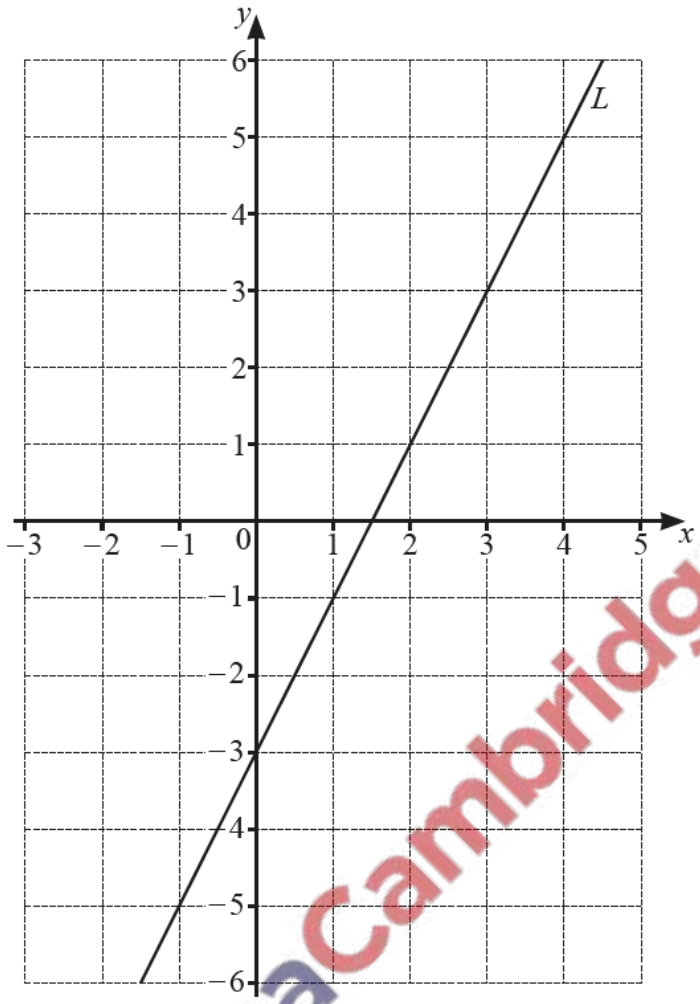


NOT TO SCALE

Work out the value of x.

$x =$ ..... [3]

36. June/2020/Paper_11/No.22



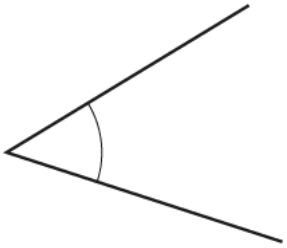
(a) Find the equation of line L in the form $y = mx + c$.

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

(b) On the grid, draw a line that is perpendicular to line L. [1]

37. June/2020/Paper_12/No.2

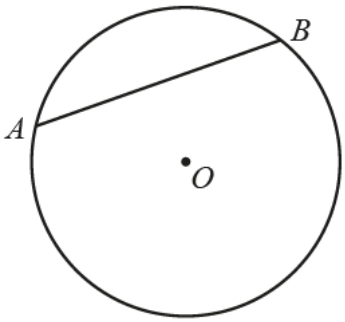
(a)



Write down the mathematical name for this type of angle.

..... [1]

(b)



NOT TO SCALE

A and B lie on a circle, centre O.

(i) Write down the mathematical name for line AB.

..... [1]

(ii) $OA = 8\,\text{cm}$

Write down the length of the diameter of this circle.

..... cm [1]

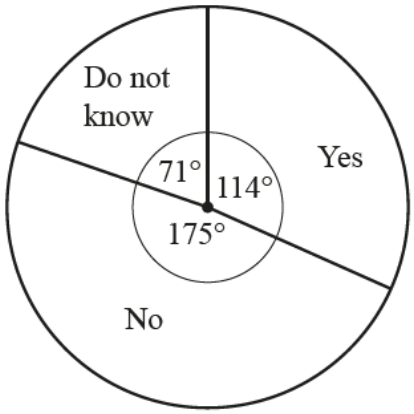
38. June/2020/Paper_12/No.3

Write down the reciprocal of 10.

..... [1]

39. June/2020/Paper_12/No.6

The 840 students in a school are asked if they want a change of school uniform.
The results are shown in the pie chart.



Show that the number of students who said Yes is 266.

[1]

40. June/2020/Paper_12/No.8

The scale drawing shows the positions of town A and town B.
The scale is 1 cm represents 12 kilometres.

Scale: 1 cm to 12 km

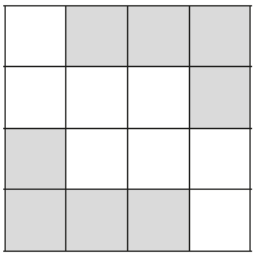
(a) Find the actual distance between town A and town B.

..... km [2]

(b) Town C is 72 km from town A and 96 km from town B.

On the scale drawing, construct the position of town C. [3]

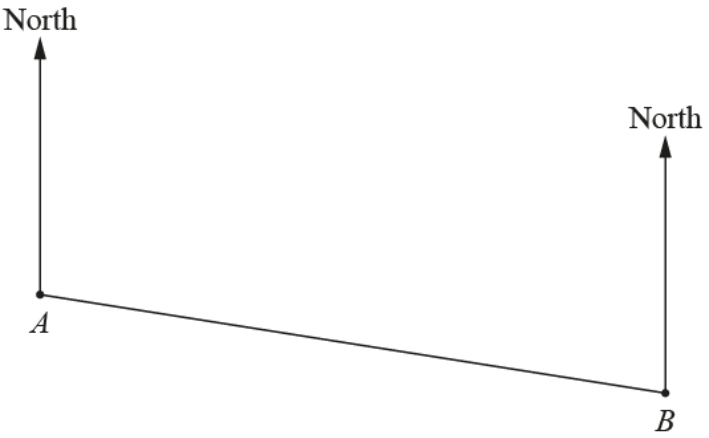
41. June/2020/Paper_12/No.9



Write down the order of rotational symmetry of the diagram.

..... [1]

42. June/2020/Paper_12/No.10

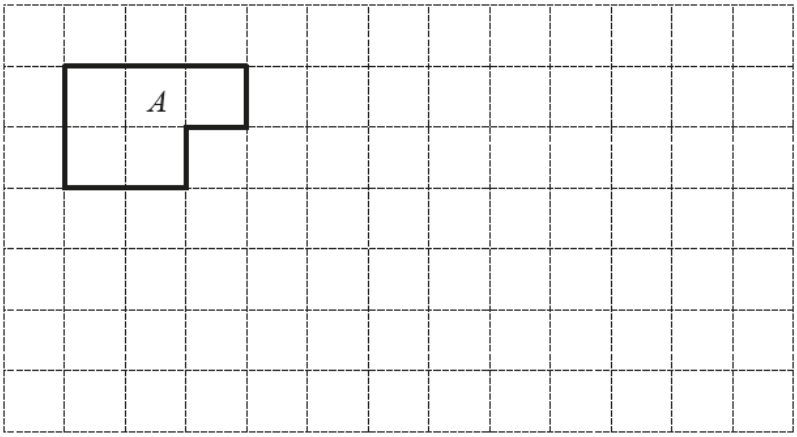


The bearing of B from A is 105°.

Find the bearing of A from B.

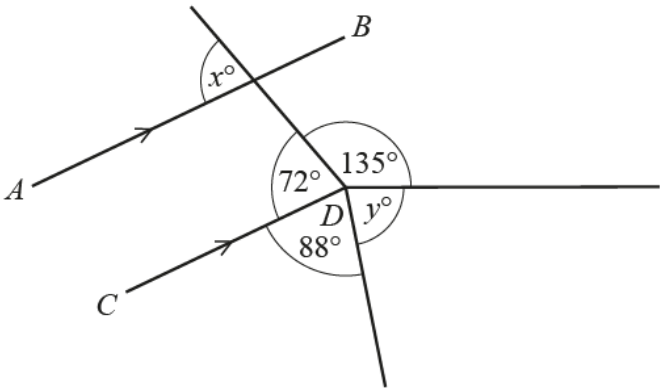
..... [2]

43. June/2020/Paper_13/No.2



On the grid, draw a shape that is congruent to shape A. [1]

44. June/2020/Paper_13/No.8



NOT TO SCALE

In the diagram, AB is parallel to CD.

(a) Find the value of x.
Give a geometrical reason for your answer.

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

(b) Work out the value of y.
Give a geometrical reason for your answer.

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

45. June/2020/Paper_13/No.10

(a) A circular garden has diameter 11.4 m.

Draw the garden accurately, using a scale of 1 cm represents 1.5 m.

Scale: 1 cm to 1.5 m

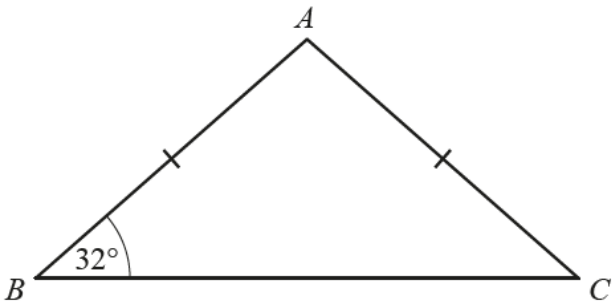
[2]

(b) On a map, the distance between two towns is 9.6 cm.
The scale of the map is 1 : 50 000.

Work out the actual distance between the two towns in kilometres.

..... km [2]

46. June/2020/Paper_13/No.11



NOT TO SCALE

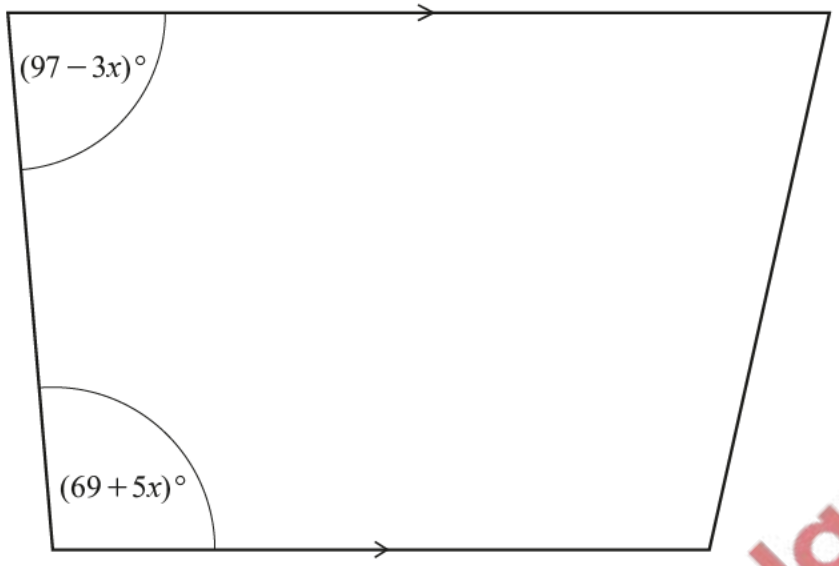
Triangle ABC is isosceles.
Angle $ABC = 32°$ and $AB = AC$.

Find angle BAC.

Angle BAC = ... [2]

47. June/2020/Paper_21/No.6

The diagram shows a trapezium.

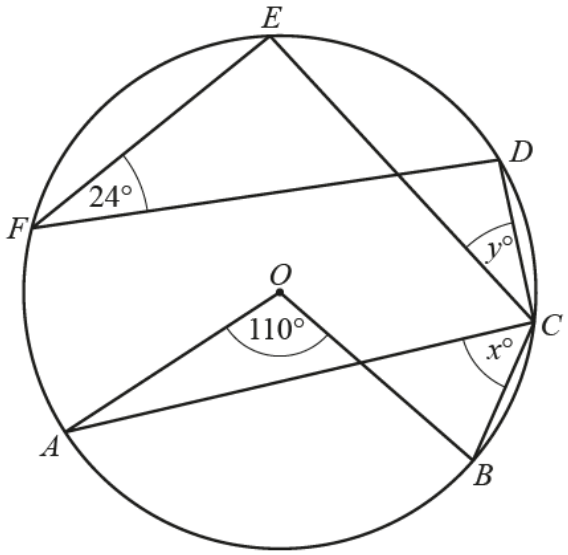


NOT TO SCALE

Work out the value of x.

$x =$ ..... [3]

48. June/2020/Paper_21/No.10



NOT TO SCALE

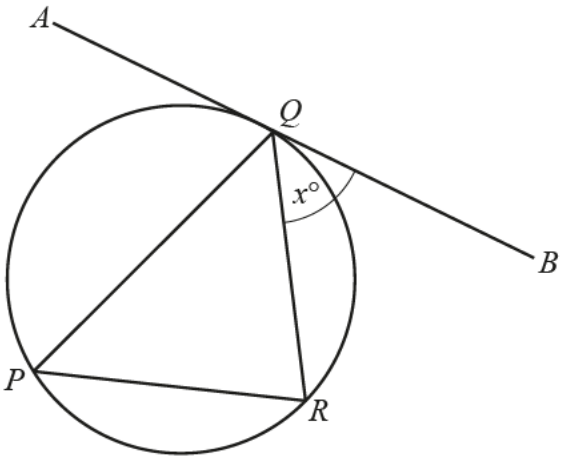
Points A, B, C, D, E and F lie on the circle, centre O.

Find the value of x and the value of y.

$x =$ .....

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

49. June/2020/Paper_21/No.15



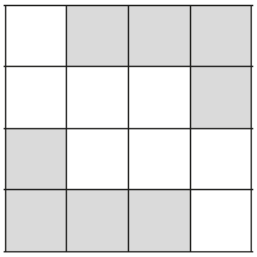
NOT TO SCALE

P, R and Q are points on the circle.
AB is a tangent to the circle at Q.
QR bisects angle PQB.
Angle $BQR = x°$ 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]

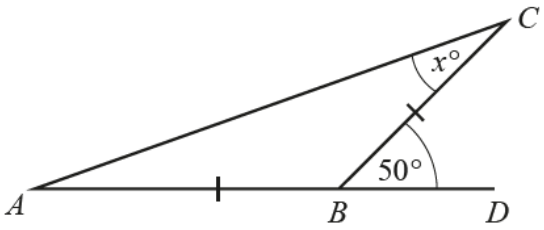
50. June/2020/Paper_22/No.1



Write down the order of rotational symmetry of the diagram.

..... [1]

51. June/2020/Paper_22/No.3



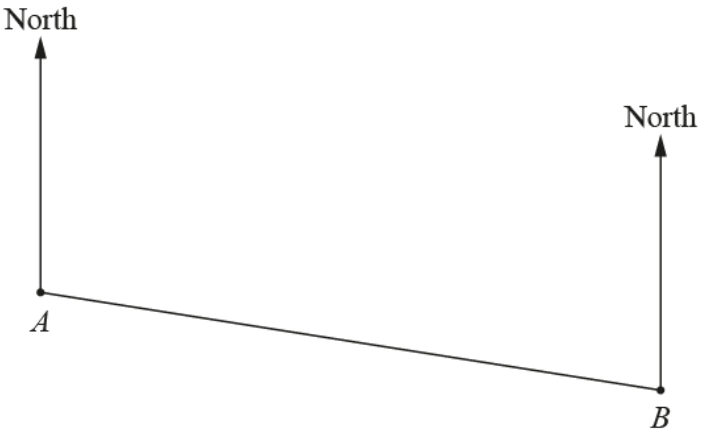
NOT TO SCALE

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

Find the value of x.

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

52. June/2020/Paper_22/No.9



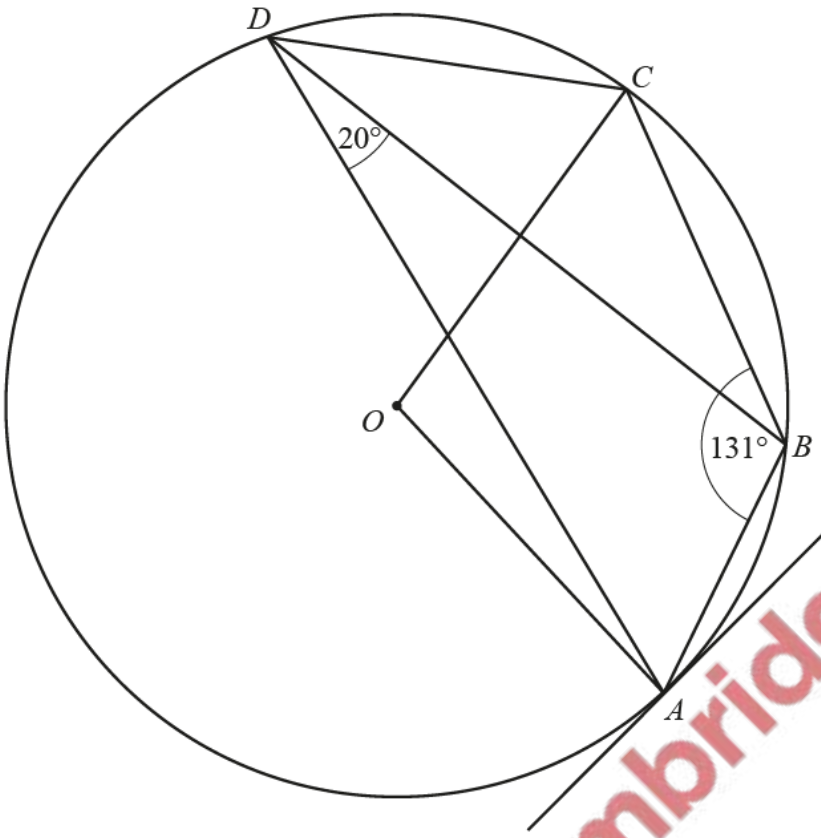
NOT TO SCALE

The bearing of B from A is 105°.

Find the bearing of A from B.

..... [2]

53. June/2020/Paper_22/No.20



NOT TO SCALE

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

Find

(a) angle ADC,

Angle ADC = ... [1]

(b) angle AOC,

Angle AOC = ... [1]

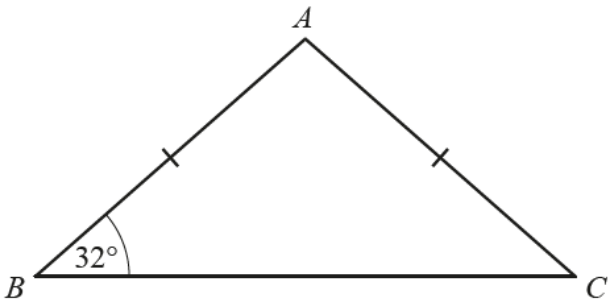
(c) angle BAT,

Angle BAT = ... [1]

(d) angle OAB.

Angle OAB = ... [1]

54. June/2020/Paper_23/No.3



NOT TO SCALE

Triangle ABC is isosceles.
Angle $ABC = 32°$ and $AB = AC$.

Find angle BAC.

Angle BAC = ... [2]

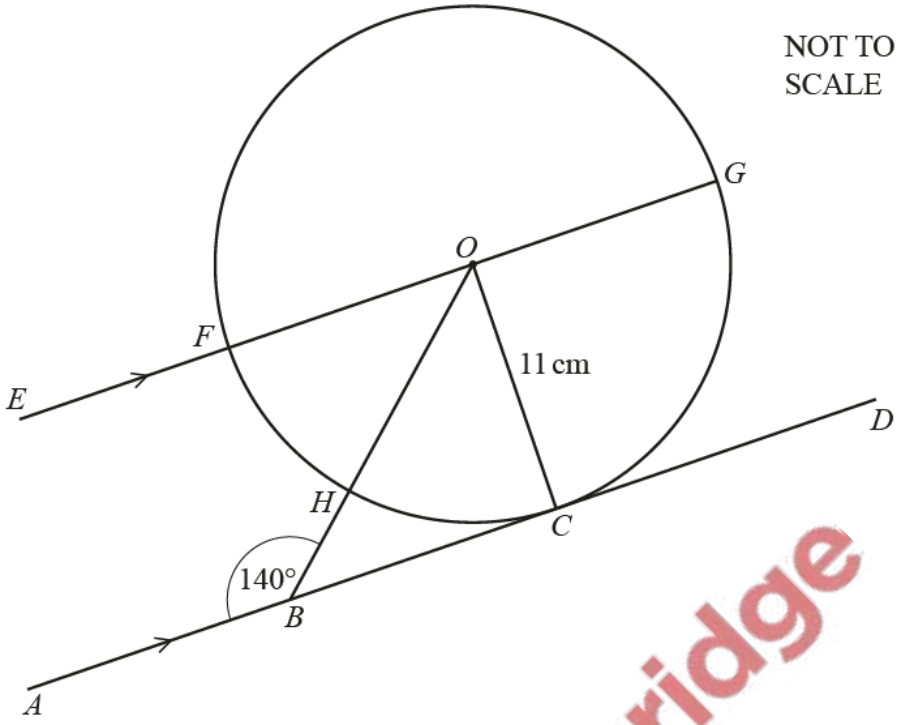
55. June/2020/Paper_23/No.8

The bearing of X from Y is 274°.

Calculate the bearing of Y from X.

..... [2]

56. June/2020/Paper_31/No.6



The diagram shows a circle, centre O, radius 11 cm.
C, F, G and H are points on the circumference of the circle.
The line AD touches the circle at C and is parallel to the line EG.
B is a point on AD and angle $ABO = 140°$.

(a) Write down the mathematical name of the straight line AD.

..... [1]

(b) **(i)** Find, in terms of π, the circumference of the circle.

..... cm [2]

(ii) Work out angle FOH.

Angle FOH = ... [2]

(iii) Calculate the length of the minor arc FH.

..... cm [2]

(c) **(i)** Give a reason why angle BCO is 90°.

..... [1]

(ii) Show that $BC = 13.11$ cm, correct to 2 decimal places.

[3]

(iii) Calculate BH.

$BH =$ ..... cm [3]

57. June/2020/Paper_31/No.10

Point B is 36 km from point A on a bearing of 140°.

(a) Using a scale of 1 centimetre to represent 4 kilometres, mark the position of B.

Scale: 1 cm to 4 km

[2]

(b) **(i)** Point C is 28 km from A and 20 km from B.
The bearing of C from A is less than 140°.

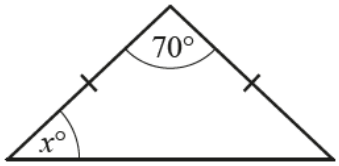
Using a ruler and compasses only, construct triangle ABC.
Show all your construction arcs. [3]

(ii) Measure angle ACB.

Angle ACB = ... [1]

58. June/2020/Paper_32/No.7

(a)



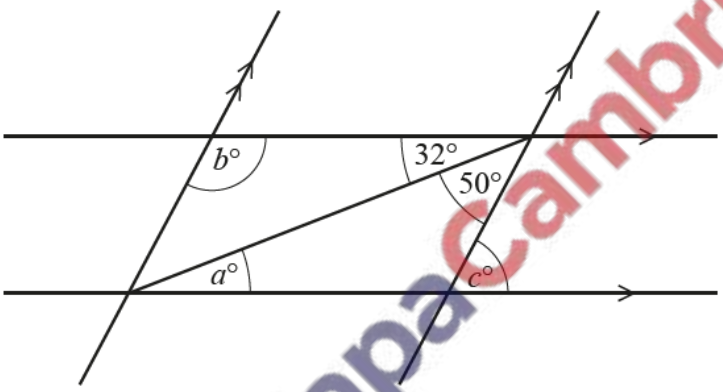
NOT TO SCALE

The diagram shows an isosceles triangle.

Find the value of x.

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

(b)



NOT TO SCALE

The diagram shows two pairs of parallel lines.

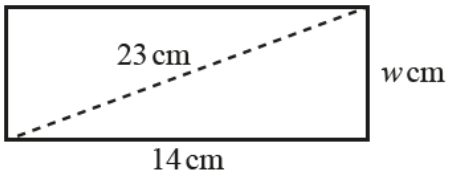
Find the value of a, the value of b and the value of c.

$a =$ .....

$b =$ .....

$c =$ ..... [3]

(c)



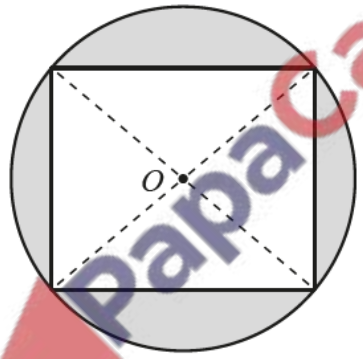
NOT TO SCALE

The diagram shows a rectangle 14 cm by w cm.
The diagonal is 23 cm.

Calculate the value of w.

$w =$ ..... [3]

(d)



NOT TO SCALE

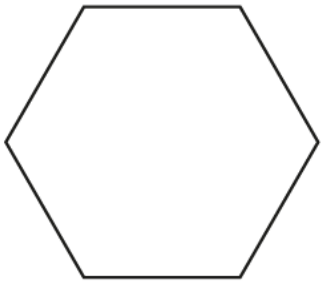
The diagram shows a square with vertices on the circumference of a circle, centre O.
The radius of the circle is 6 cm.

Work out the shaded area.

..... cm^2 [5]

59. June/2020/Paper_33/No.7

(a) The diagram shows a regular polygon.



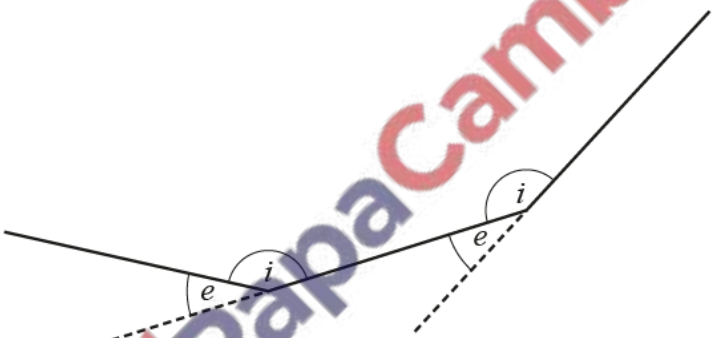
(i) Write down the mathematical name for this shape.

..... [1]

(ii) Write down the order of rotational symmetry of this shape.

..... [1]

(b) The diagram shows part of a different regular polygon.



NOT TO SCALE

e is an exterior angle.
i is an interior angle.

The ratio $e : i = 2 : 13$.

(i) Work out angle e.

..... [3]

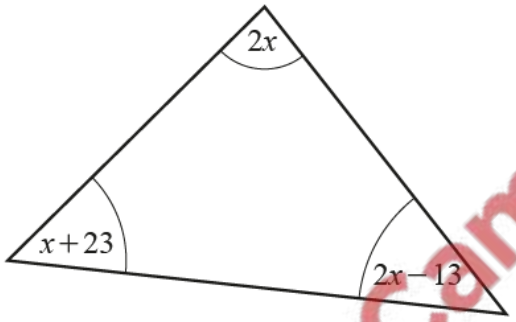
(ii) Work out the number of sides of this regular polygon.

..... [1]

(c) **Using a straight edge and compasses only**, construct the equilateral triangle ABC.
Side AB has been drawn for you.

[2]

(d) In this part, all angles are in degrees.



NOT TO SCALE

(i) Use the information in the triangle to write down an equation in terms of x.

..... [1]

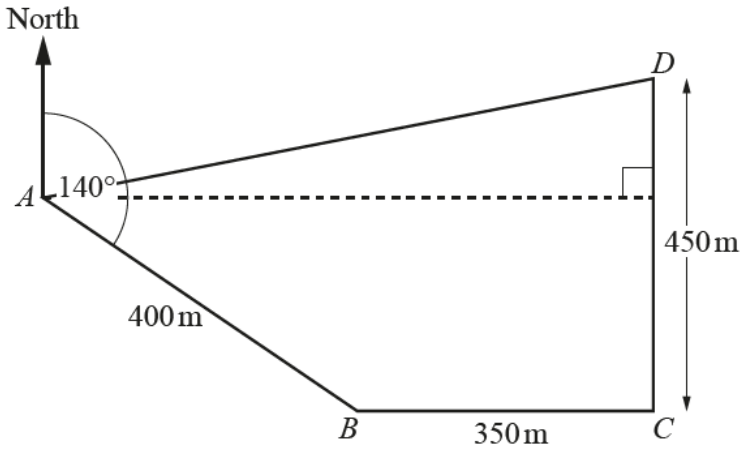
(ii) Solve this equation to find the value of x.

$x =$ ..... [3]

(iii) Work out the size of the smallest angle in the triangle.

..... [2]

60. June/2020/Paper_42/No.5



NOT TO SCALE

The diagram shows a field $ABCD$.
The bearing of B from A is 140°.
C is due east of B and D is due north of C.
$AB = 400$ m, $BC = 350$ m and $CD = 450$ m.

(a) Find the bearing of D from B.

..... [2]

(b) Calculate the distance from D to A.

..... m [6]

(c) Jono runs around the field from A to B, B to C, C to D and D to A.
He runs at a speed of 3 m/s.

Calculate the total time Jono takes to run around the field.
Give your answer in minutes and seconds, correct to the nearest second.

..... min ..... s [4]

61. June/2020/Paper_43/No.8

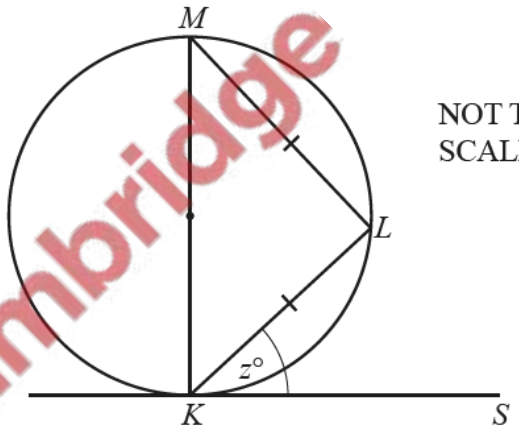
(a) The interior angle of a regular polygon with n sides is 150°.

Calculate the value of n.

$n =$ ..... [2]

(b) **(i)** K, L and M are points on the circle.
KS is a tangent to the circle at K.
KM is a diameter and
triangle KLM is isosceles.

Find the value of z.

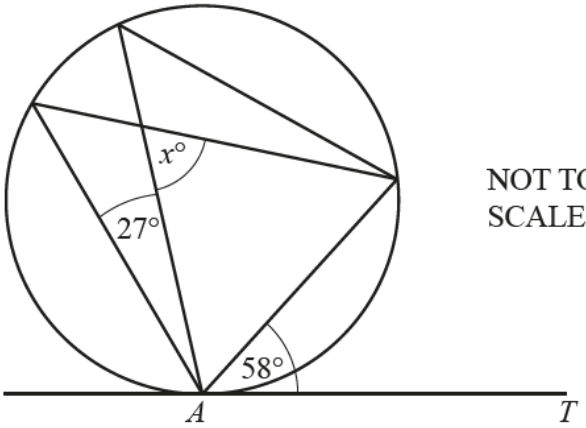


NOT TO SCALE

$z =$ ..... [2]

(ii) AT is a tangent to the circle at A.

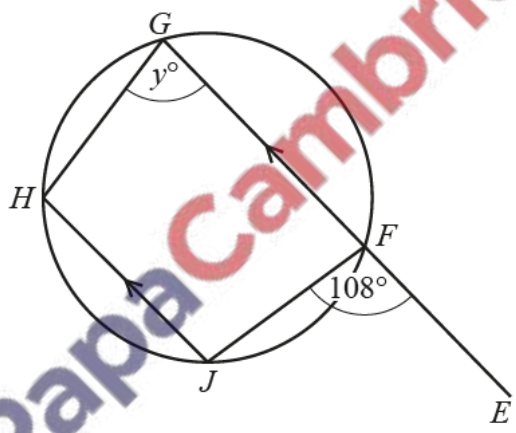
Find the value of x.



NOT TO SCALE

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

(iii)



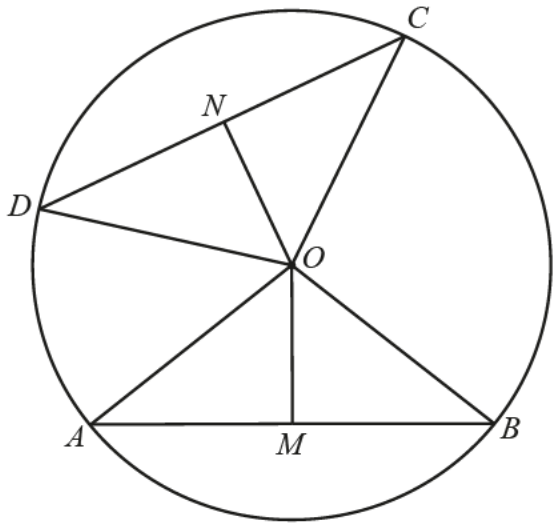
NOT TO SCALE

F, G, H and J are points on the circle.
EFG is a straight line parallel to JH.

Find the value of y.

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

(c)



NOT TO SCALE

A, B, C and D are points on the circle, centre O.
M is the midpoint of AB and N is the midpoint of CD.
$OM = ON$

Explain, giving reasons, why triangle OAB is congruent to triangle OCD.

.....

.....

.....

..... [3]