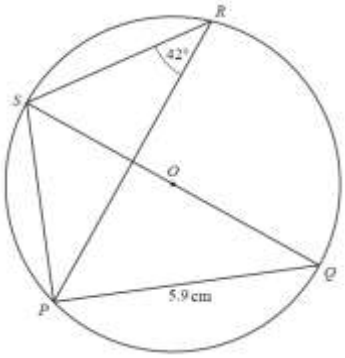
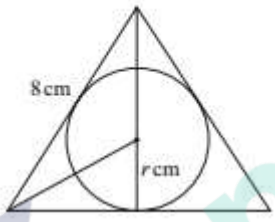
1. P, Q, R and S are points on a circle, centre O. QS is a diameter.
   Angle $PRS = 42°$ and $PQ = 5.9$ cm.
   Calculate the circumference of the circle. [5]



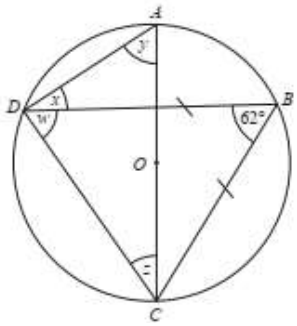
0580/41/O/N/21 Q5)(b)

2. The three sides of an equilateral triangle are tangents to a circle of radius r cm.



The sides of the triangle are 8cm long.
Calculate the value of r.
Show that it rounds to 2.3, correct to 1 decimal place. [3]
0580/43/M/J/14 Q10(a)

3. AC is a diameter.



BD = BC and angle DBC = 62 °.

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Work out the values of w, x, y and z.

Give a reason for each of your answers.

w = …….. because…… [2]

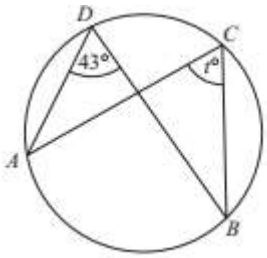
x = …….. because…… [2]

y = …….. because…… [2]

z = …….. because…… [2]

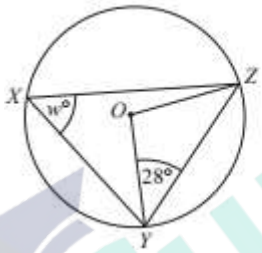
0580/41/O/N/10 Q7 (a)

4. (a) (i) A, B, C and D lie on the circumference of the circle.



Find the value of t. [1]

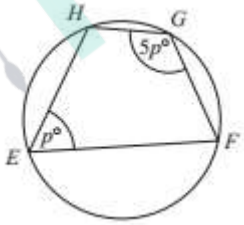
(ii) X, Y and Z lie on the circumference of the circle, centre O.



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Find the value of w, giving reasons for your answer. [3]

(iii) E, F, G and H lie on the circumference of the circle.

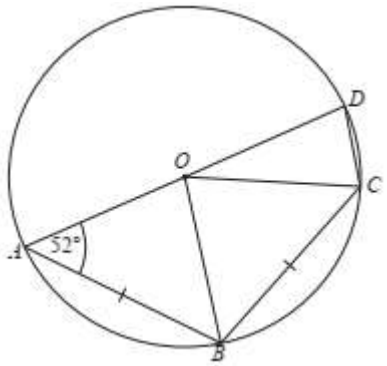


Find the value of p, giving a reason for your answer. [3]

0580/42/O/N/15 Q6

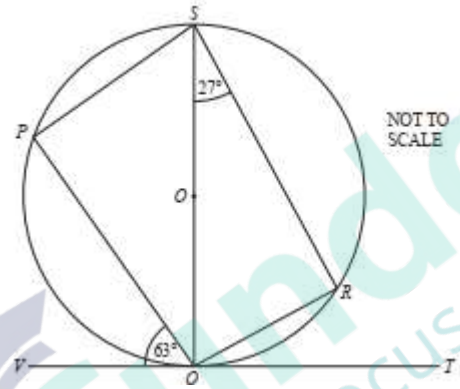
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5. (a) The diagram shows points A, B, C and D on the circumference of a circle, centre O.



AD is a straight line, AB = BC and angle OAB = 52°.
Find angle ADC. [3]

(b) The diagram shows points P, Q, R and S on the circumference of a circle, centre O.
VT is the tangent to the circle at Q.



Complete the statements.

(i) Angle QPS = angle QRS = ... ° because
.....
.....
..... [2]

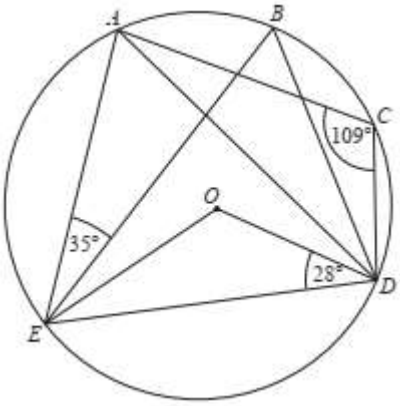
(ii) Angle SQP = ... ° because
.....
.....
..... [2]

(iii) Part (c)(i) and part (c)(ii) show that
the cyclic quadrilateral PQRS is a ..... [1]

0580/42/F/M/17 Q6)

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



Angle AEB = 35°, angle ODE = 28° and angle ACD = 109°.

(i) Work out the following angles, giving reasons for your answers.

(a) Angle EBD = ... because

.....[3]

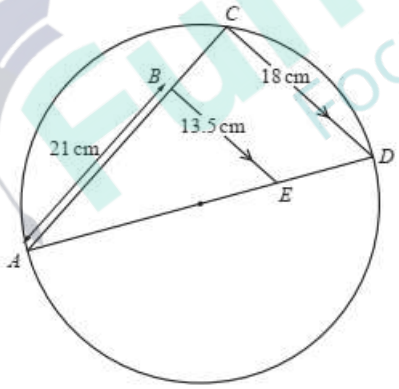
(b) Angle EAD = ... because

..... [2]

(ii) Work out angle BEO. [3]

0580/42/M/J/18 Q9

7. C lies on a circle with diameter AD.



NOT TO SCALE

B lies on AC and E lies on AD such that BE is parallel to CD.

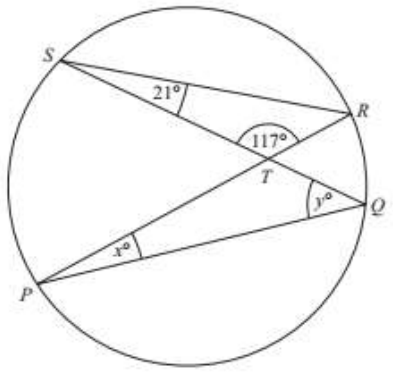
AB = 21cm, CD = 18cm and BE = 13.5cm.

Work out the radius of the circle [5]

0580/21/M/J/20 Q13)

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8. a) The chords PR and SQ of the circle intersect at T.



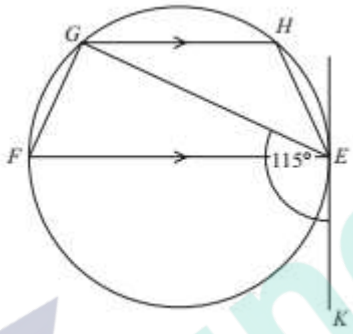
Angle RST = 21° and angle STR = 117°.

(i) Find the values of x and y. [2]

(ii) SR = 8.23 cm, RT = 3.31 cm and PQ = 9.43cm.

Calculate the length of TQ. [2]

(b) EFGH is a cyclic quadrilateral.



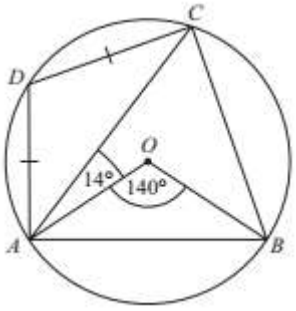
EF is a diameter of the circle.

KE is the tangent to the circle at E.

GH is parallel to FE and angle KEG = 115

Calculate angle GEH [4]

(c) A, B, C and D are points on the circle centre O.



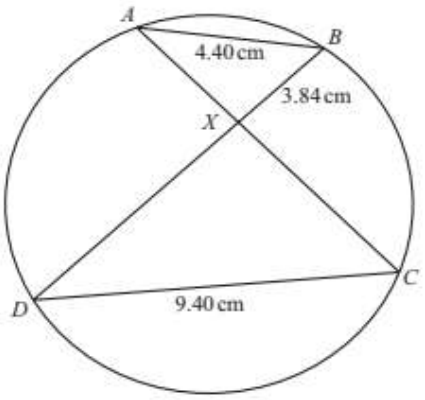
Angle AOB = 140° and angle OAC = 14°.

AD = DC. Calculate angle ACD. [5]

0580/42/M/J/14 Q6

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9. A, B, C and D lie on a circle.



AC and BD intersect at X.

(a) Give a reason why angle BAX is equal to angle CDX. [1]

(b) AB = 4.40 cm, CD = 9.40 cm and BX = 3.84 cm.

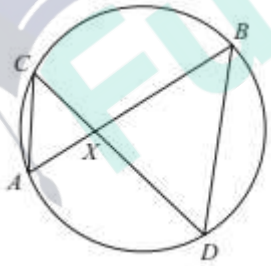
(i) Calculate the length of CX. [2]

(ii) The area of triangle ABX is 5.41 cm^2.

Calculate the area of triangle CDX. [2]

0580/23/O/N/11 Q22)

10. (a) The diagram shows a circle with two chords, AB and CD, intersecting at X.



(i) Show that triangles ACX and DBX are similar.

[2]

(ii) AX = 3.2 cm, BX = 12.5cm, CX = 4 cm and angle AXC = 110°.

(a) Find DX. [2]

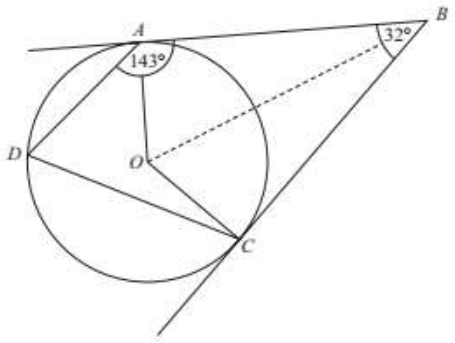
(b) Use the cosine rule to find AC. [4]

(c) Find the area of triangle BXD. [2]

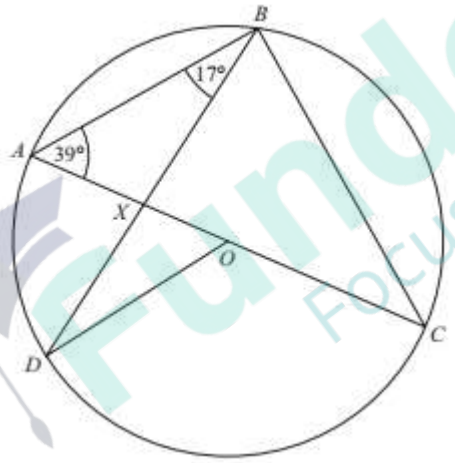
0580/41/O/N/14 Q7

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11. (a) Points A, C and D lie on a circle centre O.
BA and BC are tangents to the circle.
Angle ABC = 32° and angle DAB = 143°.
(i) Calculate angle AOC in quadrilateral AOCB. [2]
(ii) Calculate angle ADC. [1]
(iii) Calculate angle OCD. [2]
(iv) OA = 6 cm.
Calculate the length of AB. [3]



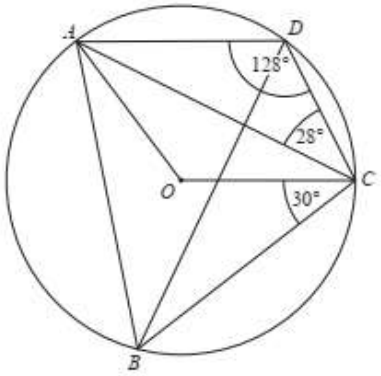
(b) A, B, C and D are on the circumference of the circle centre O.



AC is a diameter.
Angle CAB = 39° and angle ABD = 17°.
(i) Calculate angle ACB. [2]
(ii) Calculate angle BXC. [2]
(iii) Give the reason why angle DOA is 34°. [1]
(iv) Calculate angle BDO. [1]
(v) The radius of the circle is 12 cm. Calculate the length of major arc ABCD.[3]
0580/42/O/N/12 Q4)

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



Angle ADC = 128°, angle ACD = 28° and angle BCO = 30°.

(i) Show that obtuse angle AOC = 104°.

Give a reason for each step of your working. [3]

(ii) Find angle BAO. [2]

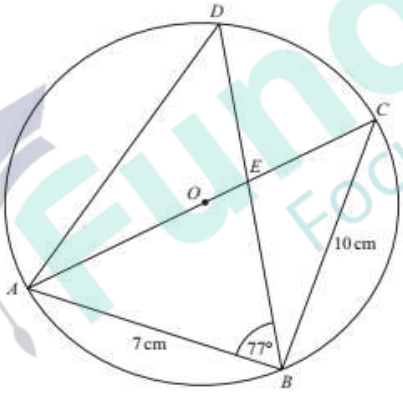
(iii) Find angle ABD. [1]

(iv) The radius, OC, of the circle is 9.6cm.

Calculate the total perimeter of the sector OADC. [3]

0580/43/O/N/19 Q6

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



AB = 7 cm, BC = 10 cm and angle ABD = 77°.

AOC is a diameter of the circle.

(a) Find angle ABC. [1]

(b) Calculate angle ACB and show that it rounds to 35° correct to the nearest degree. [2]

(c) Explain why angle ADB = angle ACB. [1]

(d) (i) Calculate the length of AD [3]

(ii) Calculate the area of triangle ABD. [2]

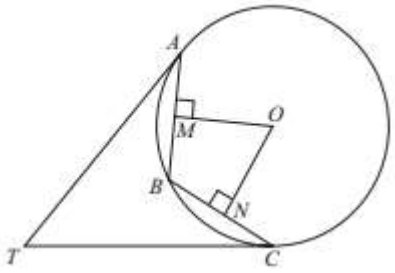
(e) The area of triangle AED = 12.3 cm^2, correct to 3 significant figures.

Use similar triangles to calculate the area of triangle BEC. [3]

0580/41/M/J/12 Q4)

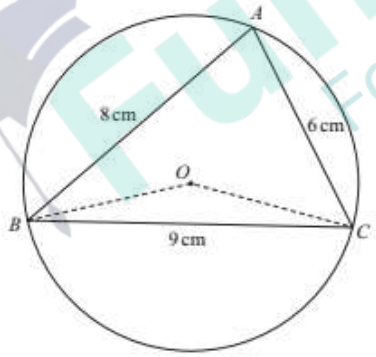
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14. A, B and C lie on the circle centre O, radius 8.5cm.



AB = BC = 10.7cm.
OM is perpendicular to AB and ON is perpendicular to BC.
(a) Calculate the area of the circle. [2]
(b) Write down the length of MB. [1]
(c) Calculate angle MOB and show that it rounds to 39° correct to the nearest degree. [2]
(d) Using angle MOB = 39°, calculate the length of the major arc AC. [3]
0580/42/M/J/13 Q4)

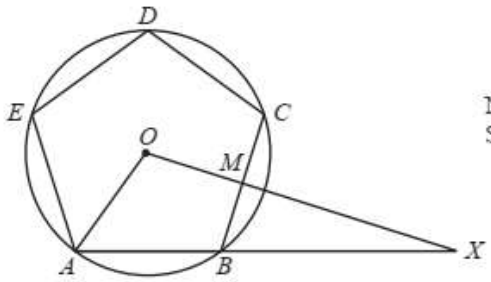
15. The circle, centre O, passes through the points A, B and C.
In the triangle ABC, AB = 8 cm, BC = 9 cm and CA = 6 cm.
(a) Calculate angle BAC and show that it rounds to 78.6°, correct to 1 decimal place.[4]



(b) M is the midpoint of BC.
(i) Find angle BOM. [1]
(ii) Calculate the radius of the circle and show that it rounds to 4.59 cm, correct to 3 significant figures. [3]
(c) Calculate the area of the triangle ABC as a percentage of the area of the circle. [4]
0580/43/M/J/11 Q4

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16. (a) Show that each interior angle of a regular pentagon is 108°.



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(b)The diagram shows a regular pentagon ABCDE.
The vertices of the pentagon lie on a circle, centre O, radius 12cm.
M is the midpoint of BC.
(i) Find BM. [3]
(ii) OMX and ABX are straight lines.
(a) Find BX. [3]
(b) Calculate the area of triangle AOX. [3]
0580/42/M/J/19 Q7)

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Answers

1) 24.94 to 24.95	9) (a) Angles in same segment (b)(i)8.2 (ii)24.7
2) 2.30	10) (a) (i) Angle ACD = angle ABD Angle CAB = angle CDB Angle AXC = angle DXB all angles are equal (a) 10 (b) 5.92 (c) 58.7
3) w = 59 (angle in) isosceles (triangle) , x = 31 (angle in) semicircle (= 90) oe , y = 62 (angles in) same segment or (on) same arc (are =) , z = 28 (angles in) triangle (= 180)	11) (a) (i) 148 (ii) 74 (iii)21 (iv) 20.9 (b) (i) 51 (ii) 56 (iii) Angle at centre twice oe angle at circumference (iv) 22 (v) 68.3
4) (a)(i)43 (ii)62 Isosceles triangle or OYZ is isosceles Angle at centre is twice angle at circumference (iii) 30 [Opposite angles of a]cyclic quadrilateral [add up to 180°]	12) (a) (i)52 x 2 (Opposite angles in cyclic quad oe Angles in opposite segments) and Angle at centre=2 × angle at circumference (ii) 22 (iii)28 (iv) 36.6
5) (b)76 (c)(i) 90 angle in semicircle (ii) 27 tangent [perpendicular to] radius (iii)rectangle	13) (a) 90 (c) same segment (d) (i) 11.9 (ii) 38.6 (e) 8.69
6) (a)(i)(a) 62 and Isosceles [triangle] and Angle at centre is twice angle at circumference oe (i)(b) 62 and [Angles in] same segment oe or angle at centre is twice angle atcircumference oe (a)(ii) 8	14) (a) 227 or 226.95 to 227.01 (b) 5.35 (c) 39.0 (d) 30.2 or 30.3
7) 16.6	15))(a) 78.58 (b) (i) 78.6 (ii) 4.590 (c) 35.5
8) (a) (i) [x =] 21, [y =] 42 (ii) 3.79 (b) 40 (c) 38	16) (b)(i) 7.05 (b)(ii)(a) 22.8 (b)(ii)(b) 179

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