Name:

Exam Style Questions

Circle Theorems

Corbettmaths

Ensure you have: Pencil, pen, ruler, protractor, pair of compasses and eraser

You may use tracing paper if needed

Guidance

1. Read each question carefully before you begin answering it.
2. Don't spend too long on one question.
3. Attempt every question.
4. Check your answers seem right.
5. Always show your workings

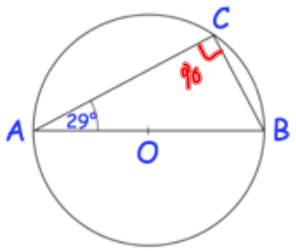
Revision for this topic

www.corbettmaths.com/contents

Video 64

Video 65

1. (a) In the diagram below, O is the centre of the circle and A, B and C are points on the circumference.



Angle A = 29°

Work out the size of angle B.

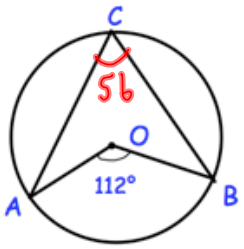
90
+ 29
119

180
− 119
61

61 .....°

(1)

(b) A, B and C are three points on the circumference of another circle.
O is the centre of the circle.



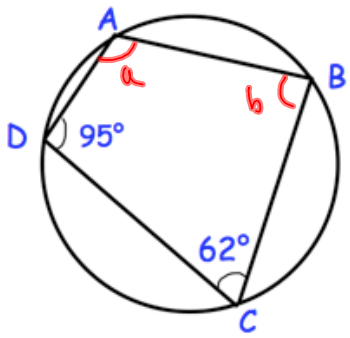
Angle AOB = 112°

Work out the size of angle ACB.

56 .....°

(1)

2. A, B, C and D are points on the circumference on a circle.



(a) Find the size of angle DAB

180 − 62 = 118

118 °

(1)

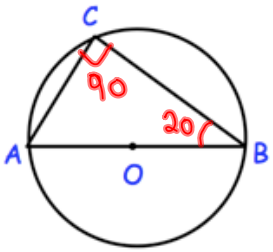
(b) Find the size of angle ABC

180 − 95 = 85

85 °

(1)

3. A circle with centre O, has points A, B and C on the circumference.
Angle ABC = 20°



Find the size of angle BAC.

140
−110
70

70 .....°

(1)

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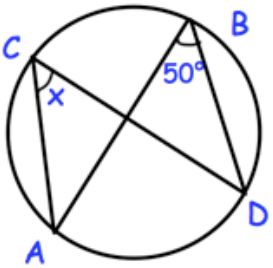
4. A, B, C and D are points on the circumference of a circle.

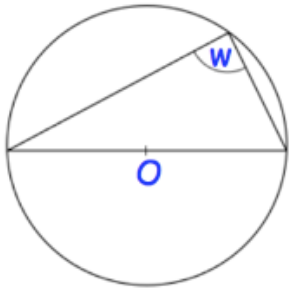


Find x, the size of angle ACD.

50 .....°

(1)

5. (a) In the diagram, O is the centre of the circle.

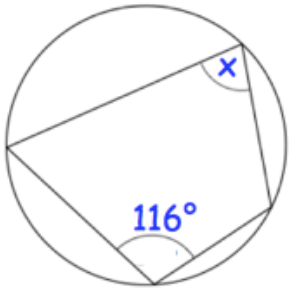


Write down the value of w.

90 .....°

(1)

(b)



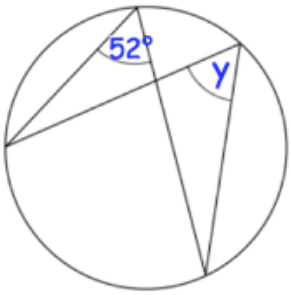
Write down the value of x.

$$\begin{array}{r} {}^{2}\cancel{3}{}^{1}\cancel{6}0 \\ -\ 116 \\ \hline 64 \end{array}$$

64 .....°

(1)

(c)

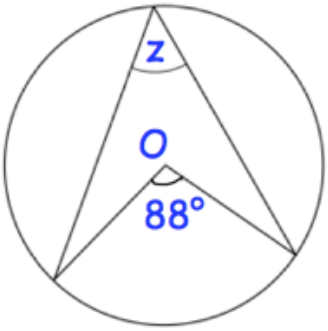


Write down the value of y.

52 .....°

(1)

(d) In the diagram, O is the centre of the circle.

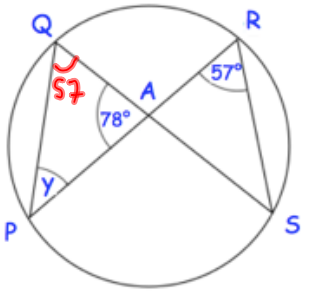


Write down the value of z.

44 .....°

(1)

6. P, Q, R and S are four points on the circumference of a circle.
PR meets QS at A.
Angle PRS = 57° and Angle PAQ = 78°



Work out the value of angle y.
Include your method.

78 + 57 = 135

180 − 135 = 45

45 °

(3)

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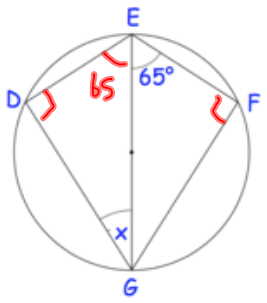
7. The diagram shows points D, E, F and G on the circumference of a circle.
EG is a diameter.
DEFG is a kite.



Work out the value of x.

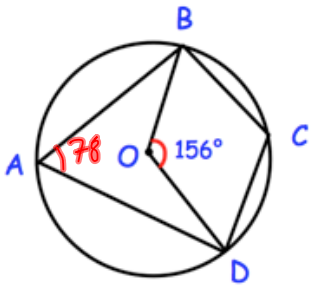
90 + 65 = 155

180 − 155 = 25

25 °

(2)

8. A, B, C and D are points on the circumference of a circle with centre O.



Work out the size of angle BCD.
You must show your workings.

$$\begin{array}{r} 180 \\ -\ 78 \\ \hline 102 \end{array}$$

102 .....°

(4)

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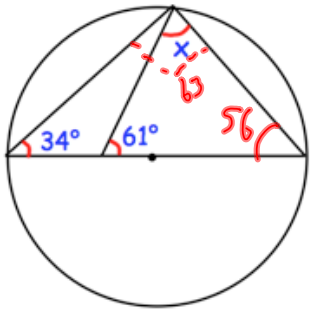
9. AB is the diameter of a circle.



$$\begin{array}{r} 61 \\ +\ 56 \\ \hline 117 \end{array} \qquad \begin{array}{r} 7\,1 \\ 1\,8\,0 \\ -\ 117 \\ \hline 63 \end{array}$$

Work out the value of x.

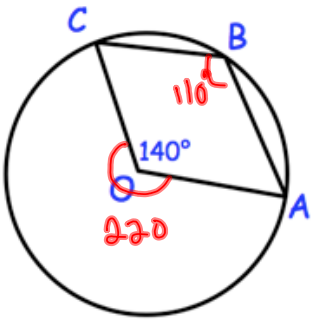
$$\begin{array}{r} 34 \\ +\ 90 \\ \hline 124 \end{array} \qquad \begin{array}{r} 7 \\ 1\,8\,0 \\ -\ 124 \\ \hline 56 \end{array}$$

63 .....°

(3)

10. The diagram shows a circle, centre O.
A, B and C are points on the circumference of the circle.

Angle AOC is 140°

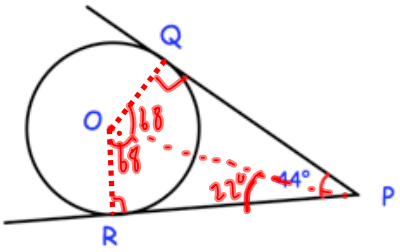


Explain why angle ABC is 110°

The reflex angle AOC is 220°, as the angles at a point add to 360°. Since the angle at the circumference is half the angle at the centre, then ABC is 110°

(2)

11. Q and R are points on a circle, centre O.
PQ and PR are tangents to the circle.



Work out the size of angle POR.

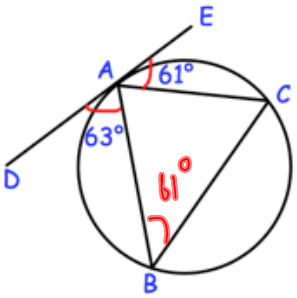
90 + 22 = 112

180 − 112 = 68

68 °

(3)

12.

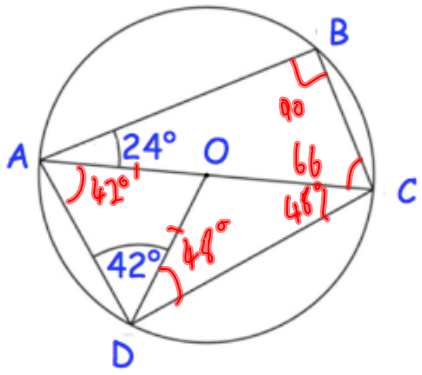


DAE is a tangent to a circle.
Write down the size of angle ABC.

61 °

(1)

13.



In the diagram O is the centre of the circle.
AOC is a straight line.
Angle BAO is 24° and Angle ADO is 42°

(a) Find the size of angle CAD.

42°

.....°

(1)

(b) Find the size of angle ACB.

90 + 24 = 114

180 − 114 = 66

66

.....°

(1)

(c) Find the size of angle BCD.

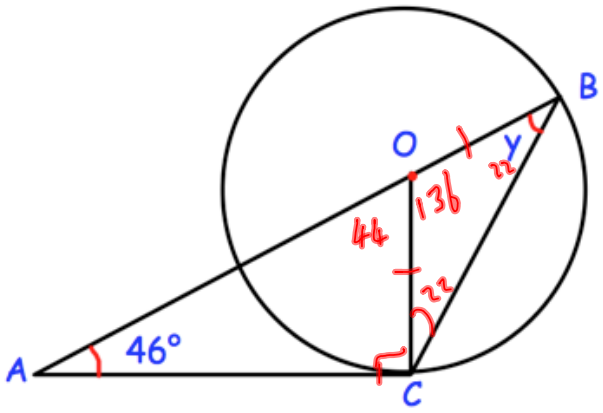
66 + 48 = 114

114

.....°

(1)

14.



AOB is a straight line.
B and C are points on the circumference of a circle, centre O.
AC is a tangent to the circle.

Work out the size of the angle y.

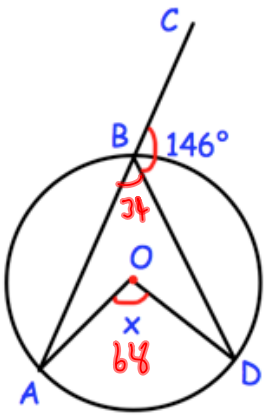
71
180
−136
44

44 ÷ 2 = 22

22 .....°

(4)

15.



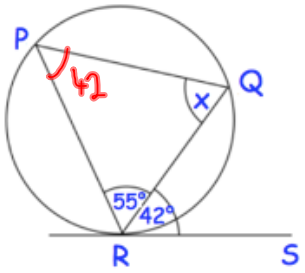
Shown is a circle with centre O.
ABC is a straight line.
Angle CBD is 146°

Find the size of angle AOD.

68 .....°

(3)

16. RS is a tangent to the circle at R.



Calculate the value of x.

Give reasons for your answer.

55 + 42 = 97

180 − 97 = 83

83 .....°

(3)

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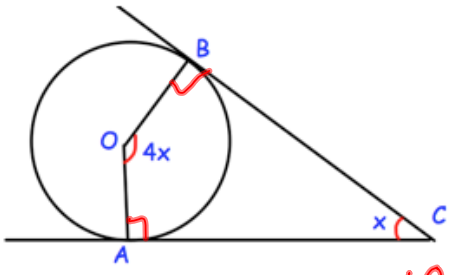
17. AC and BC are tangents to the circle with centre O.



Find the size of x.

$4x + x + 90 + 90 = 360$

$5x + 180 = 360$

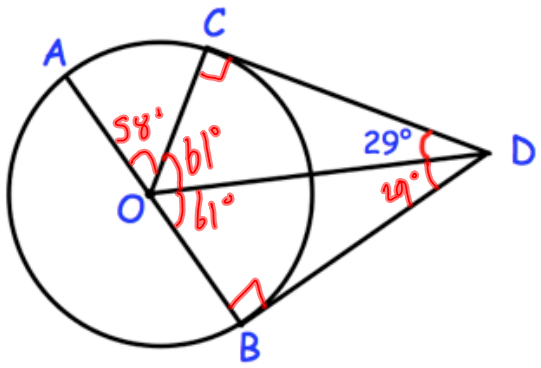
$5x = 180$

$x = 36$

36 .....°

(3)

18. A, B and C are points on the circumference of a circle with centre O.



AOB is a diameter of the circle.
CD and BD are tangents to the circle.
Angle CDO = 29°

Work out the size of angle AOC.
Give reasons for each stage of your working.

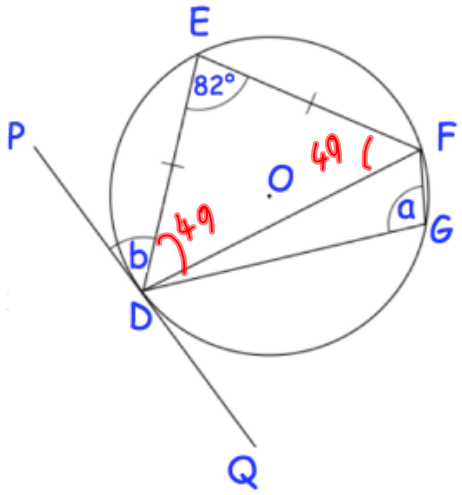
$90 + 29 = 119$ $\quad 180 - 119 = 61$

$61 + 61 = 122$ $\quad 180 - 122 = 58$

58 .....°

(4)

19. DEFG is a cyclic quadrilateral.
PDQ is a tangent at D.
O is the centre of the circle.
DEF is an isosceles triangle.



(a) Work out the value of x.

180
- 82
98

98 .....°

(2)

(b) Work out the value of y.

98 ÷ 2 = 49

180
- 82
98

49 .....°

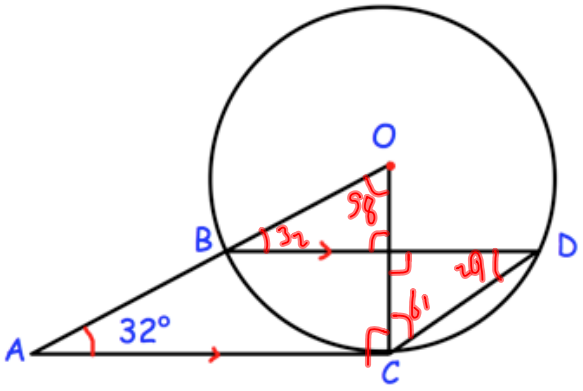
(3)

(c) Write down the name of the circle theorem used in part (b)

alternate segment theorem

(1)

20.



Shown is a circle, centre O.
B, C and D are points on the circumference.

ABO is a straight line.
AC is a tangent to the circle.

(a) Work out angle AOC.

58 .....°

(2)

(b) Work out angle BDC.

29 .....°

(3)

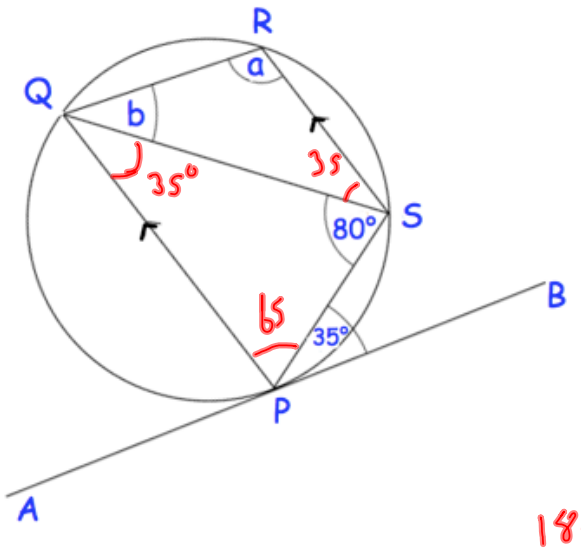
(c) Work out angle ACD.

90 + 61 = 151

151 .....°

(1)

21. PQRS is a cyclic quadrilateral.
APB is a tangent to the circle at P.
PQ is parallel to SR.
Angle SPB = 35° and angle PSQ = 80°



(a) Work out the size of angle QRS.

90 + 35 = 115
180 − 115 = 65
180 − 65 = 115

115 °

(4)

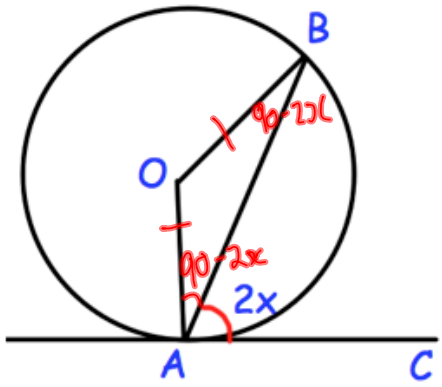
(b) Work out the size of angle RQS.

115 + 35 = 150
180 − 150 = 30

30 °

(2)

22.



A and B are points on the circumference of a circle, centre O.
CA is a tangent to the circle.
Angle CAB = 2x

Prove that angle AOB = 4x
Give reasons for each stage of your working.

- Angle OAB is 90-2x since a tangent meets a radius at 90 degrees and Angle BAC is 2x.
- Angle OBA is also 90-2x since triangle OAB is an isosceles triangle.
- Since the angles in a triangle add up to 180, angle AOB = 180 - (90-2x) - (90-2x)
= 180 - 180 + 4x
= 4x

QED **(4)**