



Higher Tier

Circle Theorems

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- You must **show all your working.**
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

Information

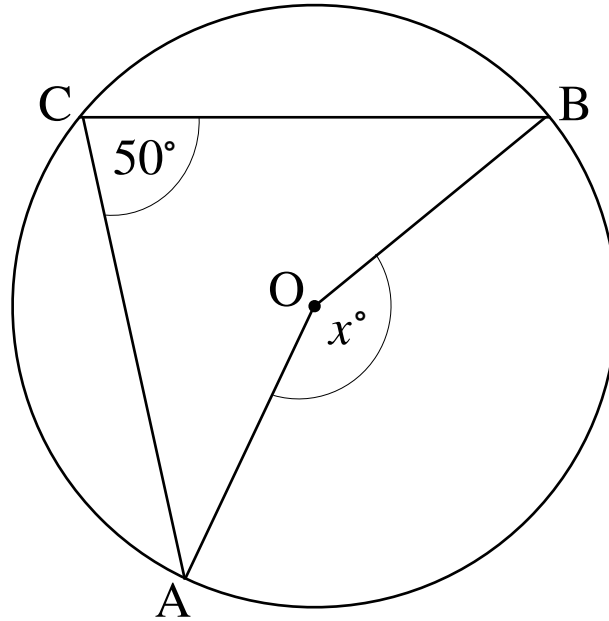
- The marks for **each** question are shown in brackets- *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
 - Keep an eye on the time.
 - Try to answer every question.
 - Check your answers if you have time at the end.
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SECTION A - Core Circle theorems

1.



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

Angle $ACB = 50^\circ$

(i) Find the size of angle AOB .

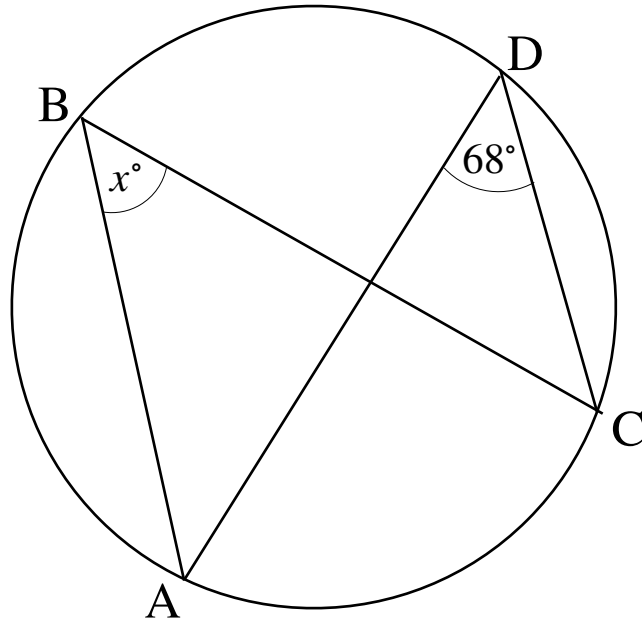
.....
(1)

(ii) Give reason for your answer

.....
.....
.....
(1)

(Total for Question 1 is 2 marks)

2.



Points A, B, C and D lie on the circumference of a circle.

Angle ADC = 68° .

(i) Find the size of angle the angle marked x .

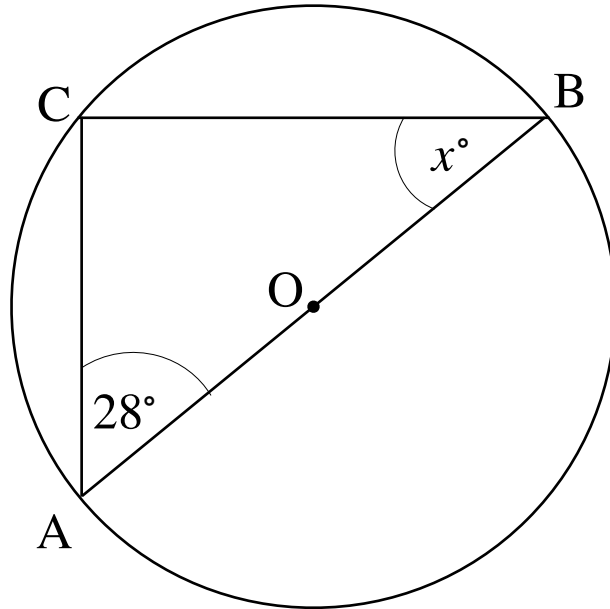
.....
(1)

(ii) Give reason for your answer

.....
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(1)

(Total for Question 2 is 2 marks)

3.



AB is a diameter of a circle.

Point C lies on the circumference.

Angle BAC = 28°.

(i) Find the size of angle the angle marked x.

.....
(2)

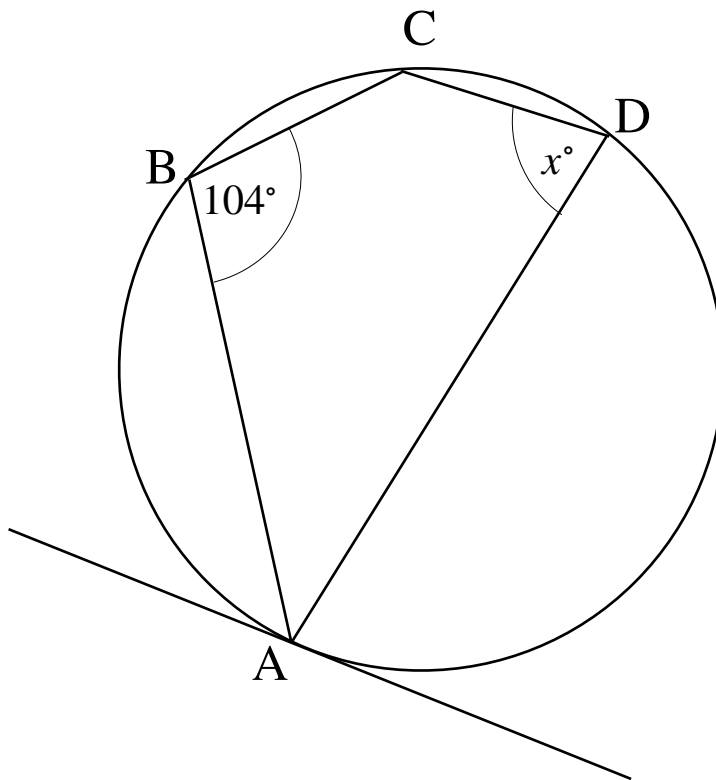
(ii) Give reason for your answer

.....
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.....

(1)

(Total for Question 3 is 3 marks)

4.



Points A, B, C and D lie on the circumference of a circle.

Angle ABC = 104°

(i) Find the size of angle marked x .

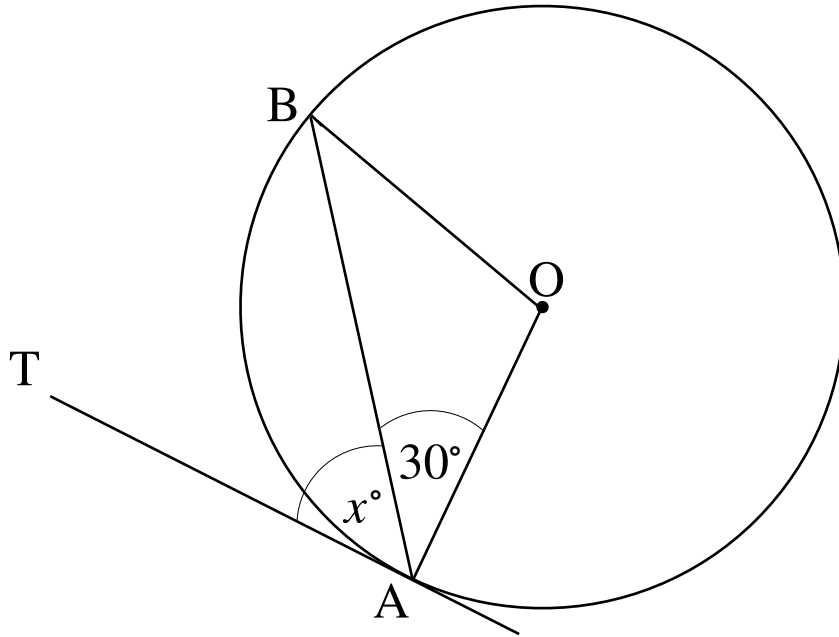
.....
(2)

(ii) Give reason for your answer

.....
.....
.....
(1)

(Total for Question 4 is 3 marks)

5.



A tangent touches a circle, centre O, at point A.

Angle BAO = 30° .

(i) Find the size of angle the angle marked x.

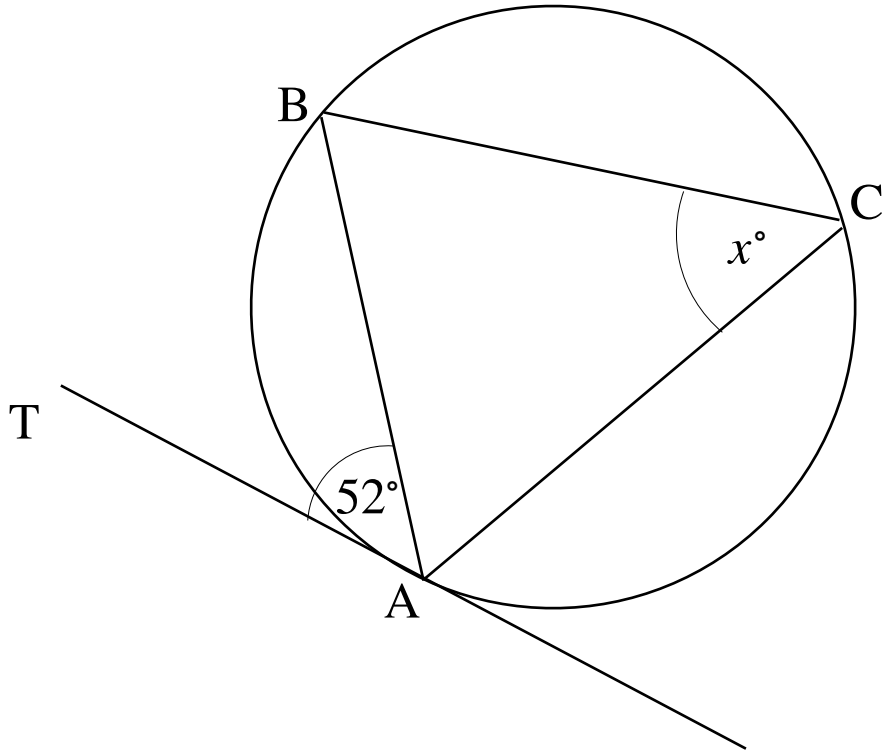
.....
(2)

(ii) Give reason for your answer

.....
.....
.....
(1)

(Total for Question 5 is 3 marks)

6.



A tangent touches a circle at point A.

The angle between the tangent and the chord AB is 52° .

(i) Find the size of angle the angle marked x .

.....
(1)

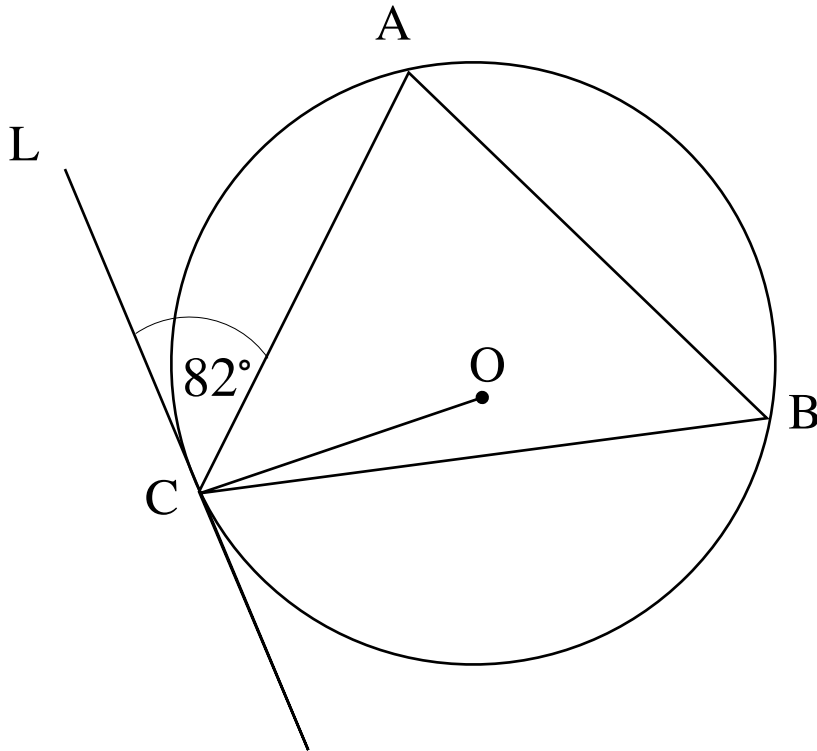
(ii) Give reason for your answer

.....
.....
.....
(1)

(Total for Question 6 is 2 marks)

SECTION B - Mixed Circle theorems

7.



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

Angle $ACL = 82^\circ$.

(a) Find the size of ACO

You must give reasons for your answer.

.....
(2)

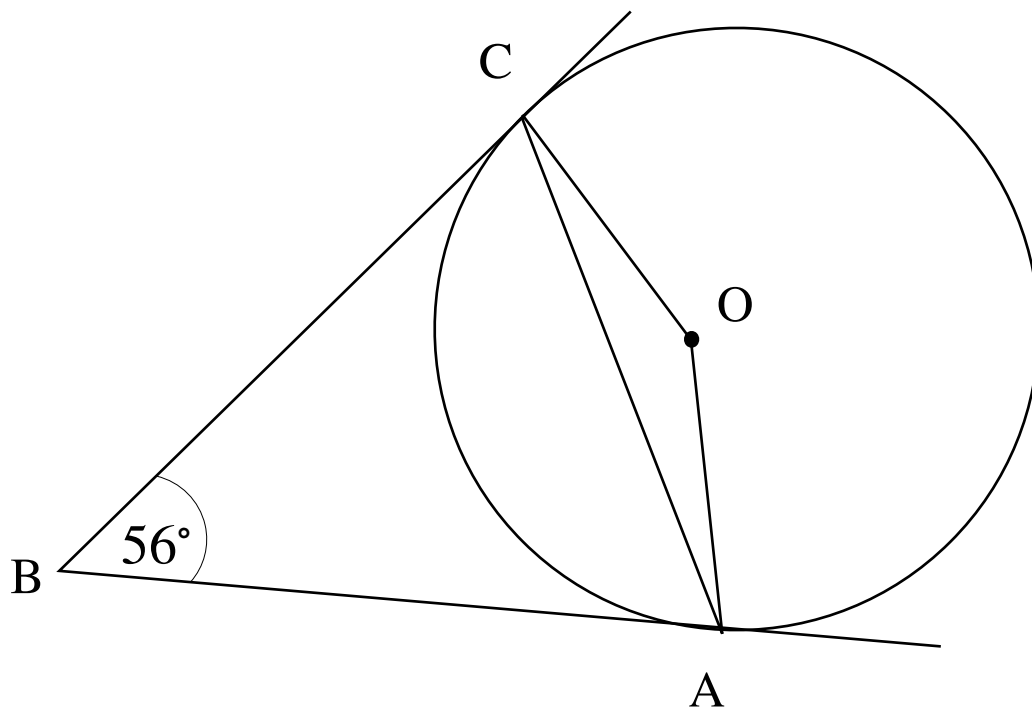
(b) Find the size of ABC

You must give reasons for your answer.

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(2)

(Total for Question 7 is 4 marks)

8.



Points A and C lie on the circumference of circle, centre O.

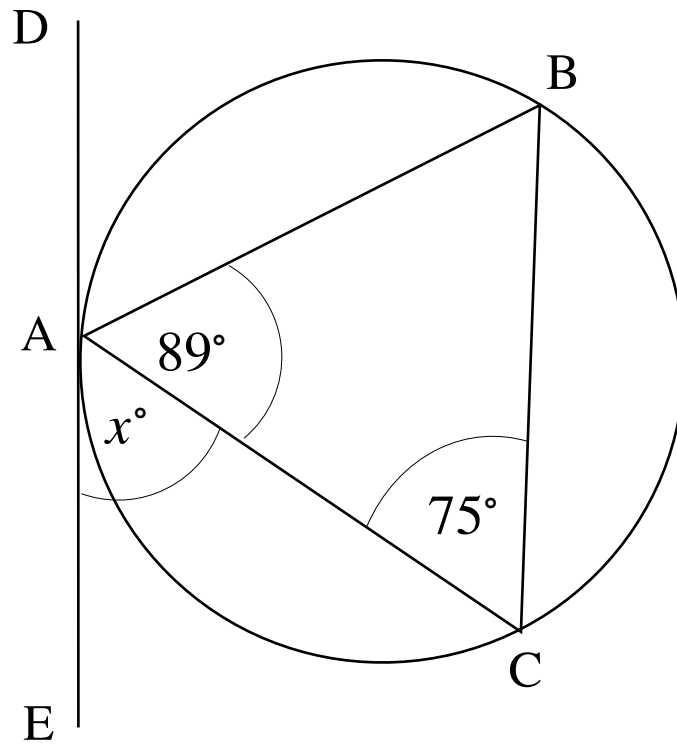
BC and AB are tangents to the circle.

Angle CBA = 56° .

Find the size of angle OCA

.....
(Total for Question 8 is 4 marks)

9.



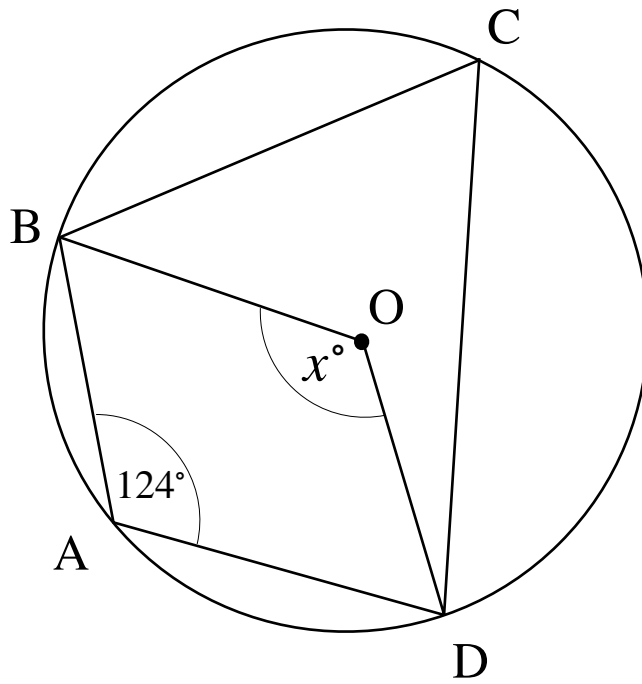
A, B and C are points on the circumference of a circle.

Find the value of x .

You must give reasons for your answer.

.....
(Total for Question 9 is 3 marks)

10.



Points A, B, C and D lie on the circumference of a circle, centre O.

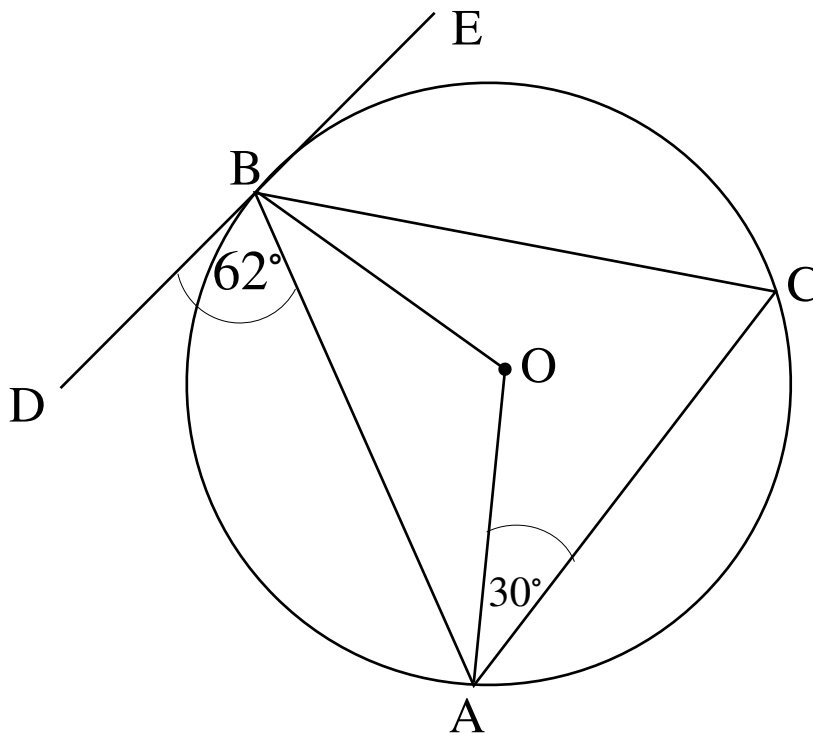
Angle $BAD = 124^\circ$

Angle $BOD = x^\circ$

Find the size of the angle marked x .

You must show all your working.

11.



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

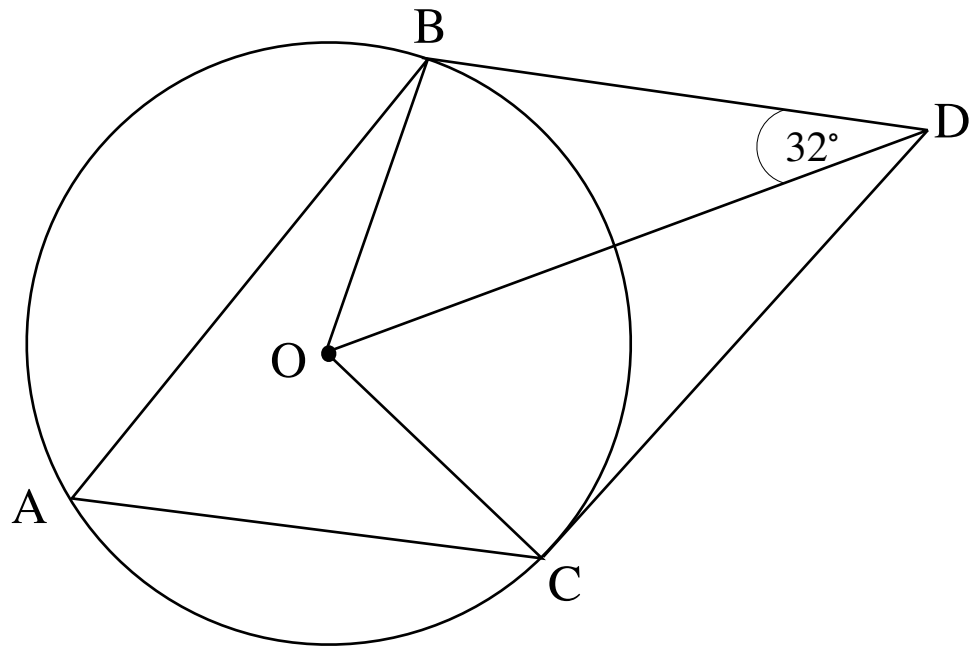
Angle $DBA = 62^\circ$

Angle $OAC = 30^\circ$

Find the size of the angle OBC .

You must show all your working.

12.



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

Angle ODB = 32°

Find the size of angle BAC.

You must show all your working.

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(Total for Question 12 is 4 marks)

TOTAL FOR PAPER IS 37 MARKS