Write your name, centre number and candidate number in the boxes below.

Surname	Other names

Centre number | | | | | |

Candidate number | | | | |

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Circle theorems

Time allowed: 45 minutes

Subject code **0580**

Mathematics

Questions from Paper 1, Paper 2, Paper 3 and Paper 4

You must have: a ruler marked in centimetres and millimetres, a protractor, compasses, a pen, an HB pencil and an eraser.
You may use a calculator.

Total marks

/ 37

Instructions

- Answer every question in the space provided on this paper.
- Write in black or dark blue ink. Pencil may be used for diagrams and graphs.
- Fill in your name, centre number and candidate number above.
- Show your working: a correct method can earn marks even if the answer is wrong.
- Unless a question says otherwise, give answers that are not exact to 3 significant figures, and angles in degrees to 1 decimal place.

Information

- This paper has 10 questions worth 37 marks in total.
- The marks for each question or part are shown in brackets, for example [3].

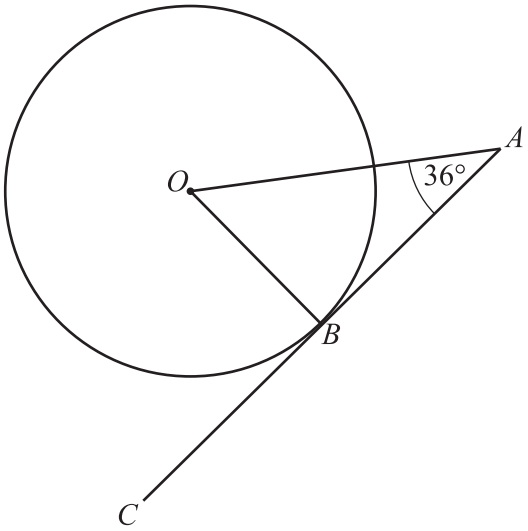
Advice

- Read every question through once before you write anything.
- Use the marks in brackets to judge how long to spend on each part.
- If you finish early, go back and check your working.

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Print at 100% (Actual size) so diagrams keep their real measurements.

1



NOT TO SCALE

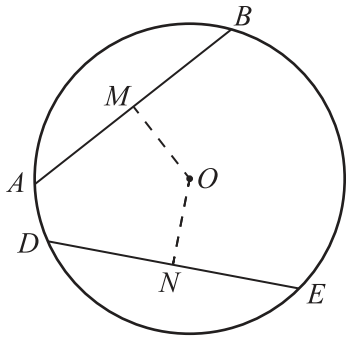
B is a point on the circle, centre O.
ABC is a tangent to the circle at B and angle $OAB = 36°$.

Work out the size of angle AOB.

Angle $AOB =$ ..... [1]

Circle theorems Click for more variations

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.

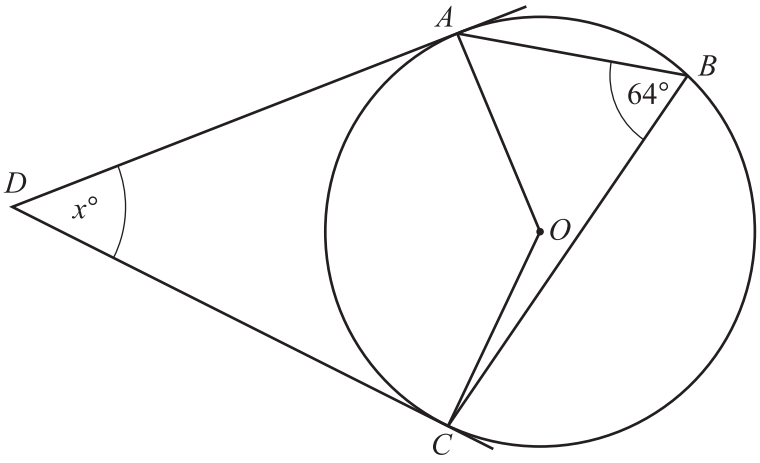
Find ON.

$ON =$ ..... cm [1]

Circle theorems Click for more variations

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3



NOT TO SCALE

A, B and C are points on the circumference of a circle with centre O.
DA and DC are tangents to the circle.
Angle $ABC = 64°$.

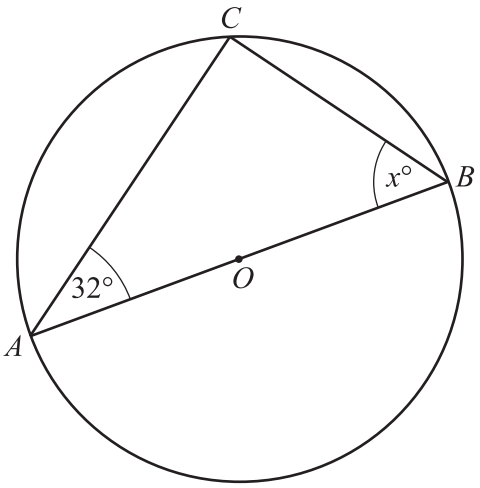
Work out the value of x.

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

Circle theorems Click for more variations

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4



NOT TO SCALE

The diagram shows a circle, centre O, diameter AB.
A, B and C lie on the circumference of the circle.

(a) Write down the mathematical name of the line AC.

..... [1]

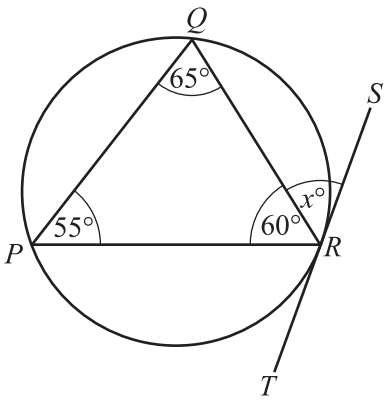
(b) Find the value of x.
Give a geometrical reason for your answer.

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

(a) 2D shapes (b) Circle theorems Click for more variations

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5



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.

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

..... [2]

(b) Another tangent from the point S touches the circle at V.

Give a geometrical reason why triangle SVR is isosceles.

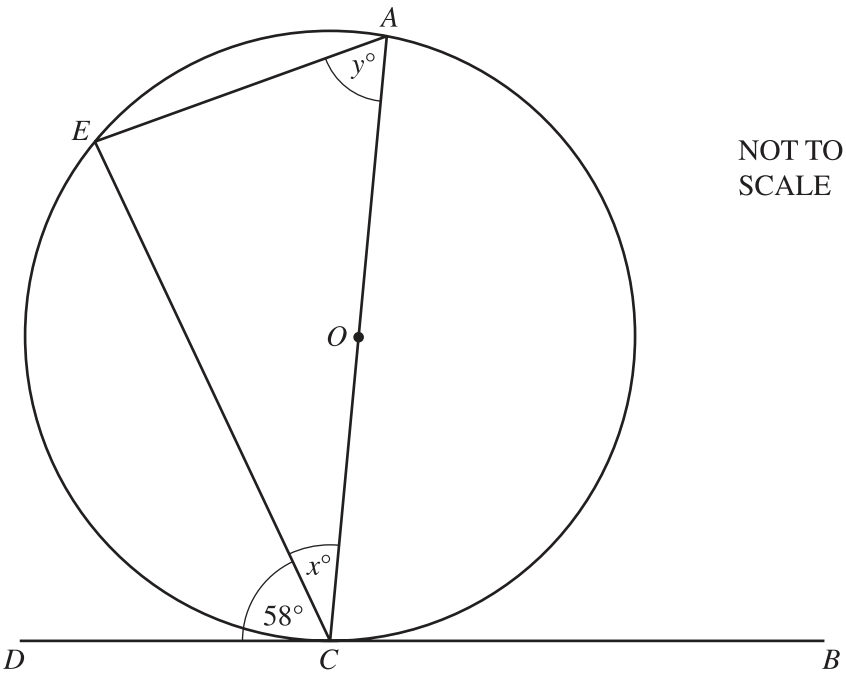
.....

..... [1]

(a) Circle theorems (b) Circle theorems Click for more variations

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6



NOT TO SCALE

AC is a diameter of a circle, centre *O*.
BCD is a tangent to the circle and *E* is a point on the circumference.
Angle *ECD* = 58°.

Work out the value of

(a) *x*,

Answer(a) x = ... [2]

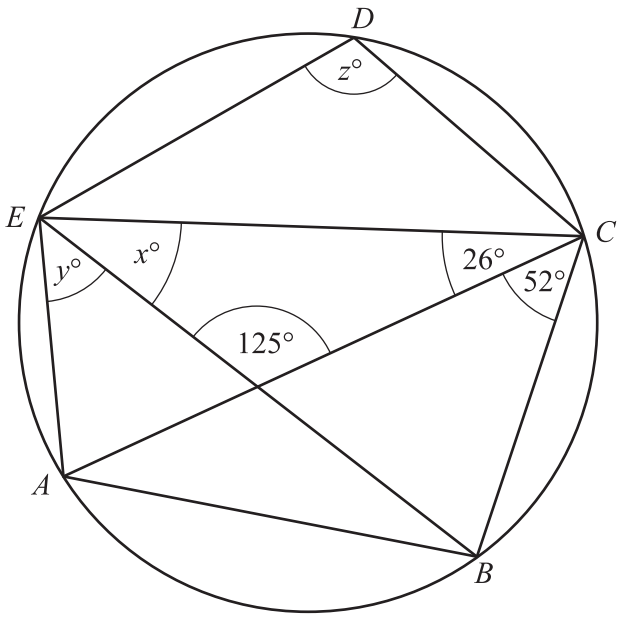
(b) *y*.

Answer(b) y = ... [2]

(a) Circle theorems (b) Circle theorems Click for more variations

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7



NOT TO SCALE

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

Find the values of x, y and z.

$x =$ .....

$y =$ .....

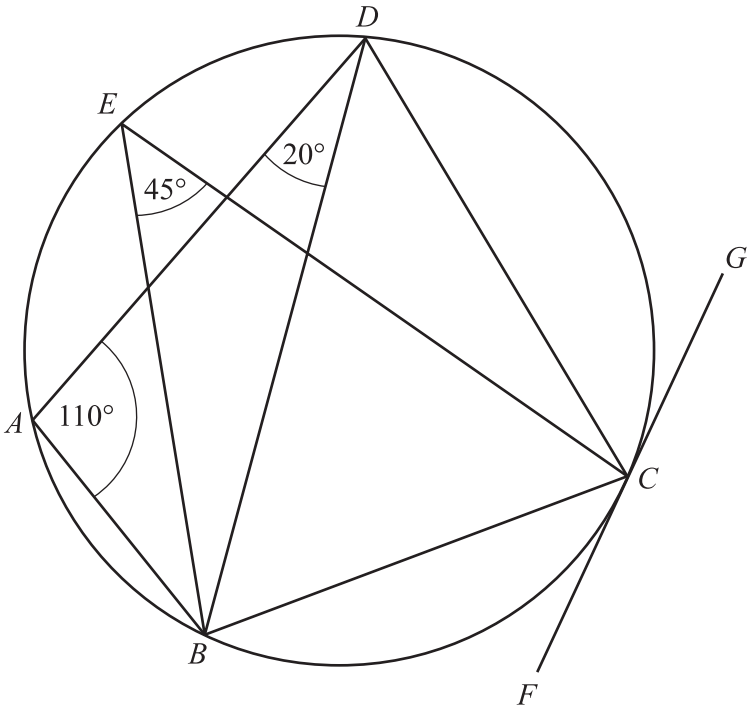
$z =$ .....

[4]

Circle theorems Click for more variations

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8



NOT TO SCALE

A, B, C, D and E lie on a circle.
FG is a tangent to the circle at C.
Angle $BAD = 110°$, angle $ADB = 20°$ and angle $BEC = 45°$.

(a) Find angle BCD.
Give a geometrical reason for your answer.

Angle BCD = ... because .....

..... [2]

(b) **(i)** Find angle DBC.

Angle DBC = ... [2]

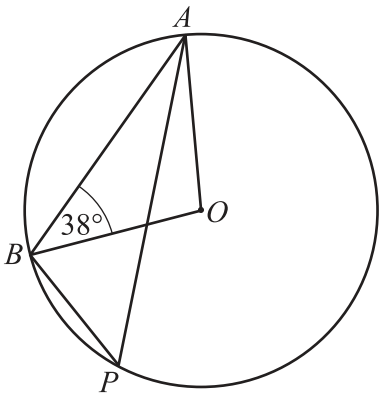
(ii) Find angle DCG.

Angle DCG = ... [1]

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(a) Circle theorems (b)(i) Circle theorems (b)(ii) Circle theorems Click for more variations

9 (a)



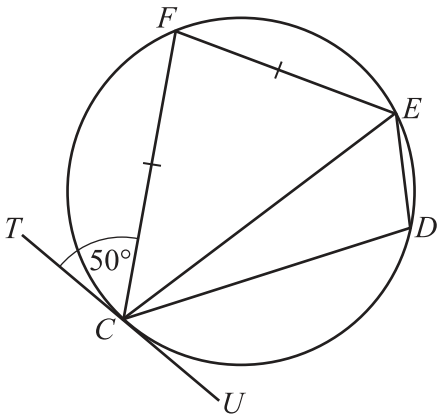
NOT TO SCALE

A, B and P are points on a circle, centre O and angle $OBA = 38°$.

Find angle APB.

Angle APB = ... [3]

(b)



NOT TO SCALE

$CDEF$ is a cyclic quadrilateral and $FC = FE$.
TU is a tangent to the circle at C and angle $TCF = 50°$.

Find

(i) angle EFC,

Angle EFC = ... [2]

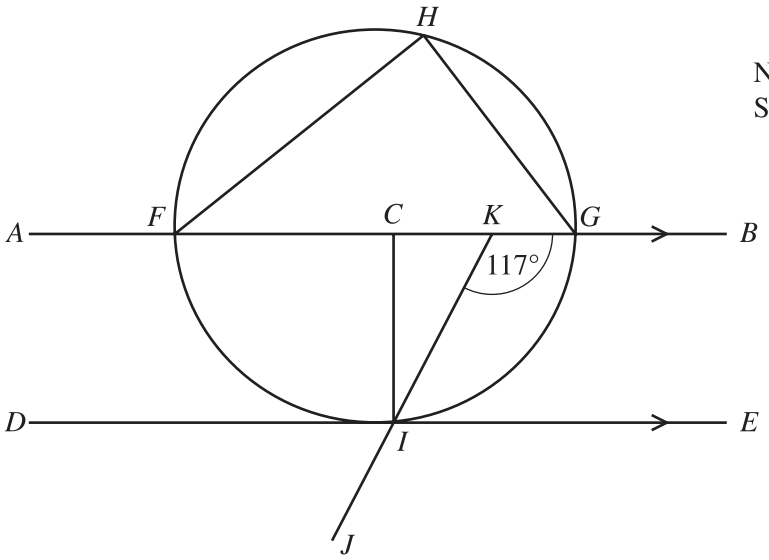
(ii) angle CDE.

Angle CDE = ... [1]

(a) Circle theorems (b)(i) Circle theorems (b)(ii) Circle theorems Click for more variations

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10



The points F, G, H and I lie on a circle, centre C.
FG is a diameter and DE is a tangent to the circle at I.
DE is parallel to AB and angle $GKI = 117°$.

Complete the following statements.

(a) Angle FKI = ... because .....

..... [2]

(b) Angle FHG = ... because .....

..... [2]

(c) Angle EIJ = ... because .....

..... [2]

(d) Angle CIE = ... because .....

..... [2]

(a) Basic angle properties (b) Circle theorems (c) Angles in parallel lines (d) Circle theorems

Click for more variations

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