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GCSE
Mathematics (Non-calculator Paper)

Practice Paper Style Questions
Topic: Circle Theorems (Higher Tier)

For this paper you must have:

- black pen
- HB pencil
- ruler (with cm & mm)
- rubber
- protractor
- compass
- pencil sharpener

Time allowed
- 1 hour

Instructions
- Use **black ink** or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the space provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work that you do not want to be marked.

Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is **46**.
  The quality of your written communication is specifically assessed in questions indicated with an asterisk (*)
- You may ask for more answer paper and graph paper.
  These must be tagged securely to this answer booklet.
- A calculator must NOT be used.

Advice
- Read each question carefully before you answer it.
- In all calculations, show clearly how you work out your answer.
- Check your answers if you have time at the end.

There are no questions printed on this page

DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED

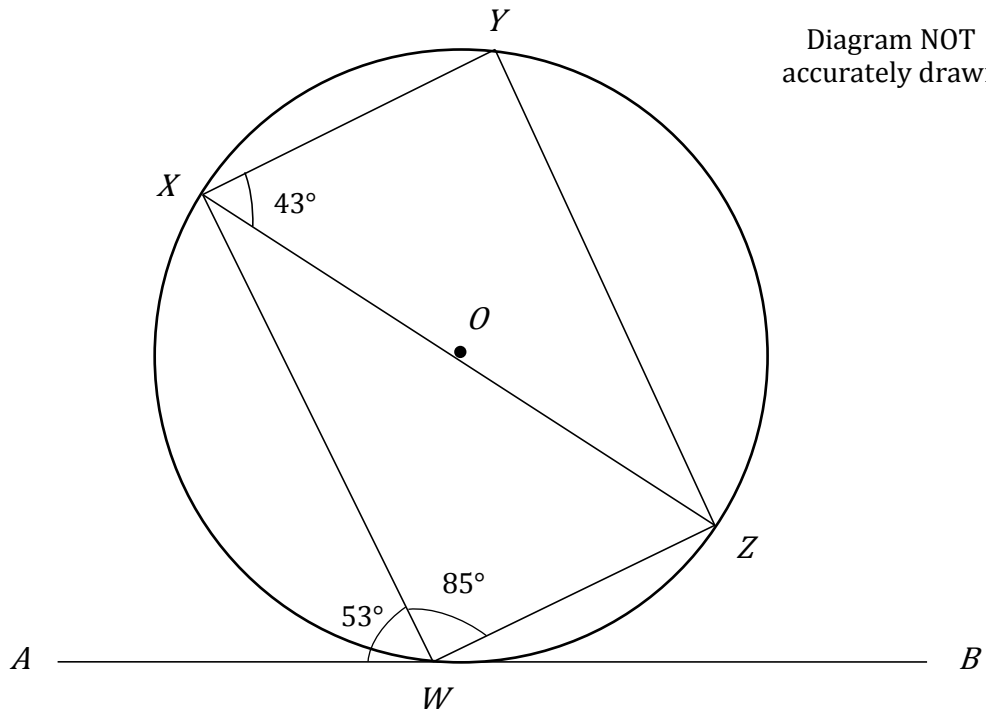**1** $WXYZ$ is a cyclic quadrilateral within a circle with centre O.

AB is the tangent to the circle at W.

Angle $AWX = 53°$

Angle $XWZ = 85°$

Angle $ZXY = 43°$

Diagram NOT
accurately drawn

Prove that WX is parallel to YZ.

(5 marks)

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2 Here is a circle with centre O
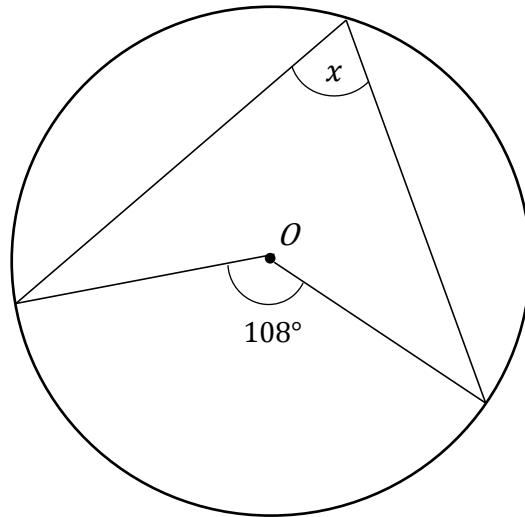
Diagram NOT accurately drawn

(a) Write down the value of x

Answer …….................................... *(1 mark)*

Here is a different circle:
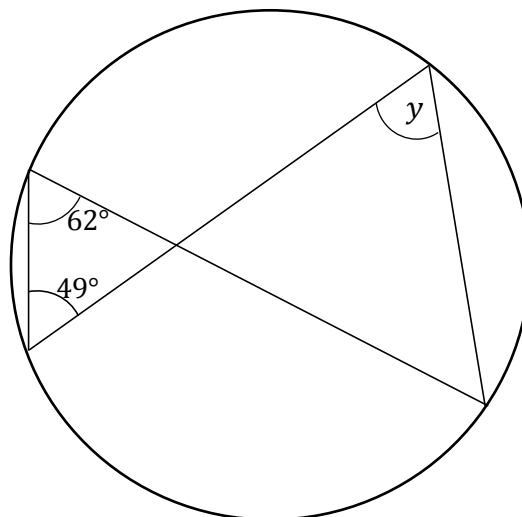
Diagram NOT accurately drawn

(b) Write down the value of y

Answer …….................................... *(1 mark)*

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

AC is a diameter of the circle.
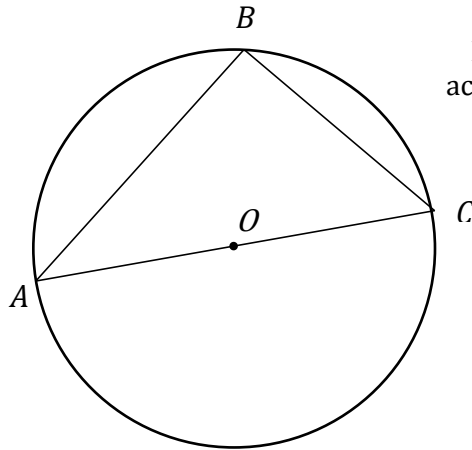
Diagram NOT accurately drawn

(a) (i) Write down the size of angle ABC

Answer …….................................

(ii)* Give a reason for your answer:

……...

……...

(2 marks)

D, E and F are points on the circumference of a circle with centre O

Angle $DOF = 120°$

Diagram NOT accurately drawn

120°
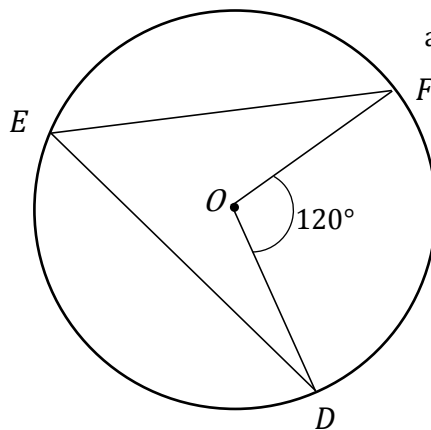
(b) (i) Work out the size of angle DEF

Answer …….................................

(ii)* Give a reason for your answer:

……...

……...

(2 marks)

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

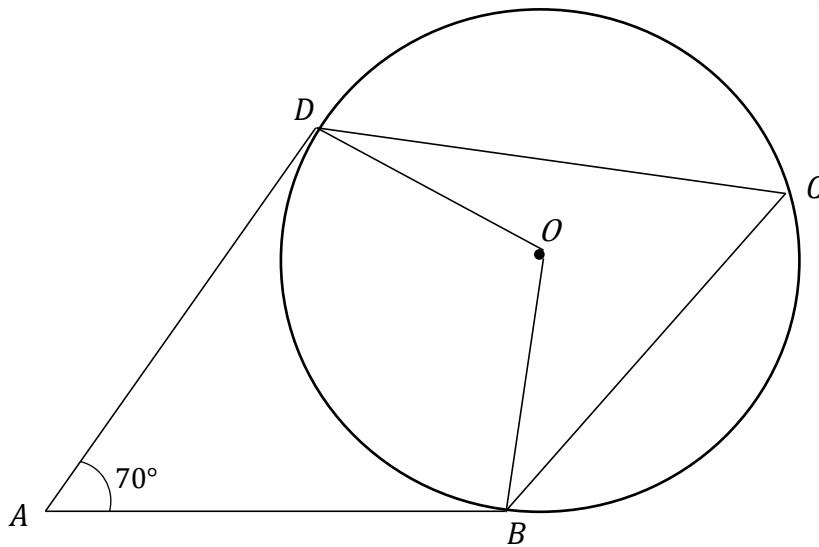AB and AD are tangents to the circle.

Angle $BAD = 70°$

Diagram NOT
accurately
drawn

Work out the size of angle BAD

Give a reason for each stage of your working.

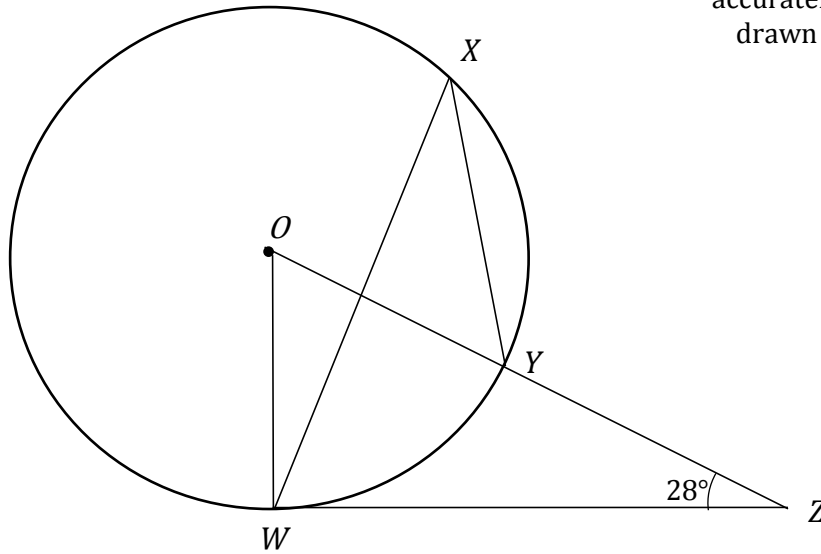*Answer* …….................................... *(4 marks)*

5 *W*, *X* and *Y* are points on the circumference of a circle with centre *O*

ZYO is a straight line.

ZW is a tangent to the circle.

Angle *WZO* = 28°

Diagram NOT
accurately
drawn

(a) Work out the size of angle *WOZ.*

Answer …….................................... *(2 marks)*

(b) (i) Work out the size of angle *WXY.*

Answer …….................................... *(1 mark)*

(ii)* Give a reason for your answer:

……...

……...

(2 marks)

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6   In the diagram W, X, Y and Z are points on the circumference of a circle with centre O.
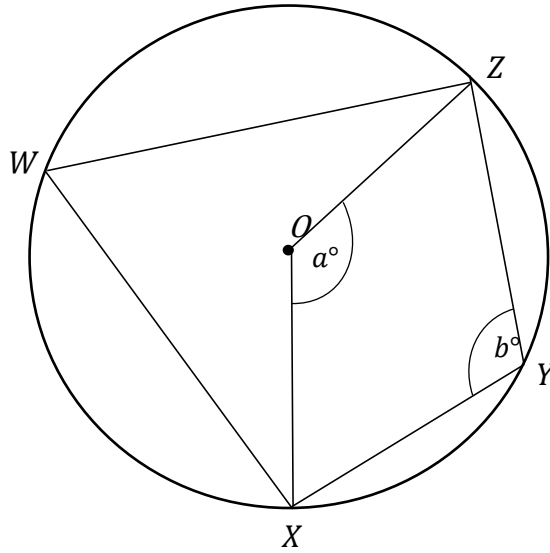
Angle $XWZ = 70°$

Angle $XOZ = a°$

Angle $XYZ = b°$

Diagram NOT accurately drawn

(a) (i) Work out the value of a.

Answer …….....................................

(ii)* Give a reason for your answer:

……...

……...

(2 marks)

(b) (i) Work out the value of b.

Answer …….....................................

(ii)* Give a reason for your answer:

……...

……...
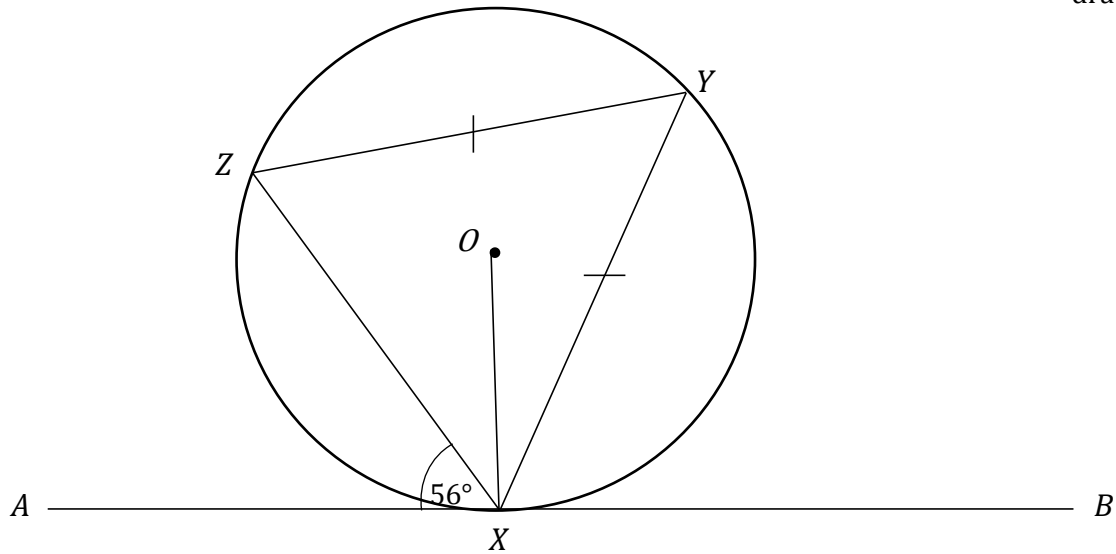
(2 marks)

7 In the diagram X, Y and Z are points on the circumference of a circle with centre O.

Angle $ZXA = 56°$

The line AXB is the tangent at X to the circle.

$ZY = XY$

Diagram NOT
accurately
drawn

Calculate the size of angle OXY.

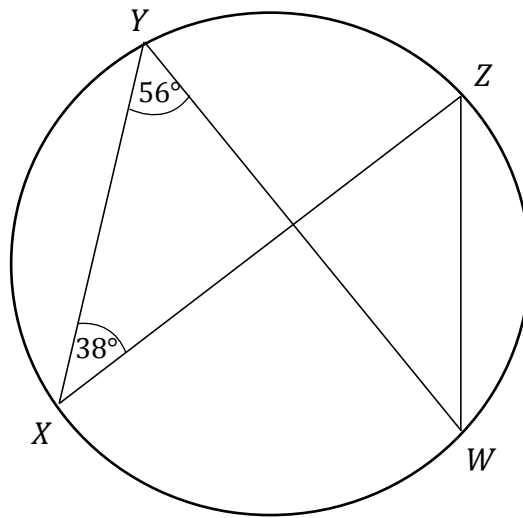Give a reason for each stage of your working.

Answer …….................................... *(5 marks)*

9

8 In the diagram X, Y and Z are points on the circumference of a circle with centre O.

Angle $XYW = 56°$

Angle $YXZ = 38°$

Diagram NOT accurately drawn

(i) Find the size of angle XZW.

Answer ….....................................

(ii)* Give a reason for your answer:

……...

……...

(2 marks)

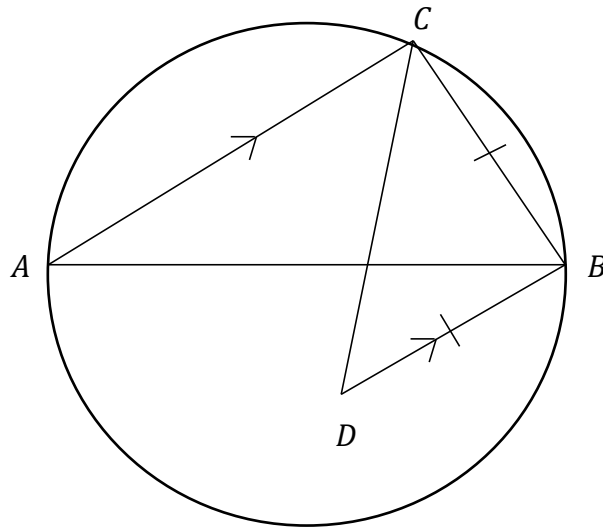**9** AB is a diameter of a circle.

C is a point on the circle.

D is the point inside the circle such that $DB = BC$ and BD is parallel to CA.

Diagram NOT
accurately
drawn

Calculate the size of angle BDC.

Give a reason for each stage of your working.

Answer ……................................. (4 marks)

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10 *VWXYZ* is a cyclic quadrilateral.

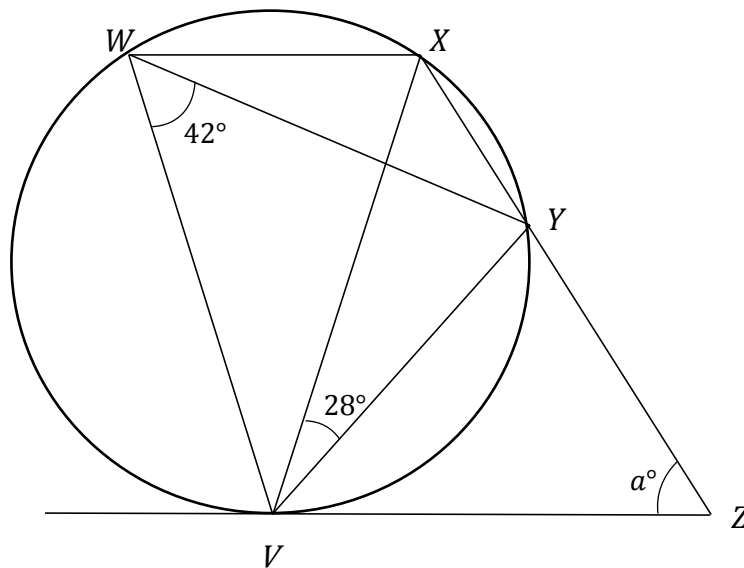*VZ* is a tangent at *A*.

XYZ is a straight line.

Angle *XVY* = 28°

Angle *VWY* = 42°

Diagram NOT accurately drawn

Calculate the size of angle *VZY*, marked *a* on the diagram.

You **must** show your working.

Give reasons for any angles you work out.

Answer …….................................... *(5 marks)*

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

Angle $BCD = 128°$

$CD = BC$

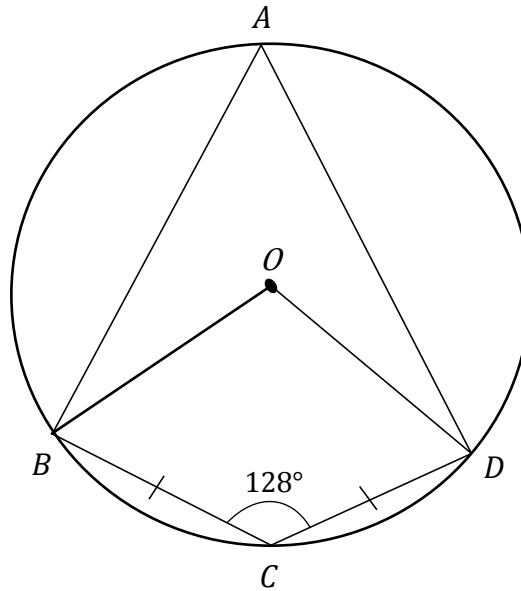Diagram NOT
accurately
drawn

A

O

B

$128°$

D

C

(a) Write down the size of angle BAD giving a reason for your answer.

Answer ……................................. (2 marks)

(b) Write down the size of angle ODC giving reasons for your answer:

Answer ……................................. (4 marks)

END OF QUESTIONS

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