Circle Theorems (H)

A collection of 9-1 Maths GCSE Sample and Specimen questions from AQA, OCR, Pearson-Edexcel and WJEC Eduqas.

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1. (a) Calculate the size of the angle marked $x$.
   You must give a reason for your answer.

   ![Diagram](Diagram not drawn to scale)

   

(b) The diagram shows a circle with centre O.
   The tangent PT touches the circle at C.
   The reflex angle at the centre of the circle is 280°.

   ![Diagram](Diagram not drawn to scale)
Diagram not drawn to scale

Find the size of $B\hat{A}C$.
You must give a reason for your answer.

(c) The points $A$, $B$ and $C$ lie on the circumference of a circle.
The straight line $PBT$ is a tangent to the circle.
$CBP = x$, where $x$ is measured in degrees.

Show that the size of $ABC$ in degrees is $90 - \frac{1}{2}x$
You must give reasons for each step of your answer.

2. $A$, $B$ and $C$ are points on a circle.
   - $BC$ bisects angle $ABQ$.
   - $PBQ$ is a tangent to the circle.
Angle $CBQ = x$

Prove that $AC = BC$

3. A, B, C and D are points on the circumference of a circle, centre O.
AC is a diameter of the circle.
Angle ABD = 58°.
Angle CDB = 22°.

Work out the sizes of angle ACD and ACB, giving reasons for your answers.

(a) Angle ACD = .........................° [2]

(b) Angle ACB = .........................° [3]
4. \(S\) and \(T\) are points on the circumference of a circle, centre \(O\).

\(PT\) is a tangent to the circle.

\(SOP\) is a straight line.

Angle \(OPT = 32^\circ\)

Work out the size of the angle marked \(x\).

You must give a reason for each stage of your working.

5. The diagram shows a circle, centre \(O\).

Points \(P, Q, R\) and \(S\) lie on the circumference of the circle.

\(UST\) is a tangent to the circle.

Angle \(RPS = 44^\circ\) and angle \(PSO = 32^\circ\).
a) Work out the value of $x$.

b) Work out the value of $y$.

6.

$PQRST$ is a regular pentagon.

$R, U$ and $T$ are points on a circle, centre $O$.

$QR$ and $PT$ are tangents to the circle.

$RSU$ is a straight line.

Prove that $ST = UT$. 
7. A, B and C are points on the circumference of a circle centre O.

Prove that angle BOC is twice the size of angle BAC.

8. B, C and D are points on a circle.

Angle ABC = 92°
Angle ACB = 38°
Angle ACD = 50°
Angle CDE = 32°

Tick whether each statement is true or false.
Give a reason for each answer.
9. A, B, C and D are points on a circle, centre O.
   AC is a diameter of the circle.
   AT is a tangent to the circle.
Work out the size of angle \( x \) and the size of angle \( y \).
**Credits and Notes**

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**Notes:**

These questions have been retyped from the original sample/specimen assessment materials and whilst every effort has been made to ensure there are no errors, any that do appear are mine and not the exam board's (similarly any errors I have corrected from the originals are also my corrections and not theirs!).

Please also note that the layout in terms of fonts, answer lines and space given to each question does not reflect the actual papers to save space.

These questions have been collated by me as the basis for a GCSE working party set up by the GLOW maths hub - if you want to get involved please get in touch. The objective is to provide support to fellow teachers and to give you a flavour of how different topics “could” be examined. They should not be used to form a decision as to which board to use. There is no guarantee that a topic will or won’t appear in the “live” papers from a specific exam board or that examination of a topic will be as shown in these questions.

**Links:**

- OCR  [http://ocr.org.uk/gcsemaths](http://ocr.org.uk/gcsemaths)

**Contents:**

This version contains questions from:

- AQA – Sample Assessment Material, Practice set 1 and Practice set 2
- OCR – Sample Assessment Material and Practice set 1
- Pearson Edexcel – Sample Assessment Material, Specimen set 1 and Specimen set 2
- WJEC Eduqas – Sample Assessment Material