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**Circle Theorems B**

**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 be3.142

unless the question instructs otherwise.

**Information**

* The total mark for this paper is **23**. There are **6** questions.
* Questions have been arranged in an ascending order of mean difficulty, as found by all students in the June 2017–November 2019 examinations.
* 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.

**1** *A*, *B*, *C* and *D* are four points on the circumference of a circle.

**

*AEC* and *BED* are straight lines.

Prove that triangle *ABE* and triangle *DCE* are similar.

You must give reasons for each stage of your working.

**(Total for Question 1 is 3 marks)**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

A close up of a keyboard

Description automatically generated**2** *A*, *B*, *C* and *D* are four points on a circle.

**

*AEC* and *DEB* are straight lines.

Triangle *AED* is an equilateral triangle.

Prove that triangle *ABC* is congruent to triangle *DCB*.

**(Total for Question 2 is 4 marks)**

**3**

**

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

*AOB* is a diameter of the circle.

Prove that angle *ACB* is 90°

You must **not** use any circle theorems in your proof.

**(Total for Question 3 is 4 marks)**

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**4**



*A*, *B*, *R* and *P* are four points on a circle with centre *O*.

*A*, *O*, *R* and *C* are four points on a different circle.

The two circles intersect at the points *A* and *R*.

*CPA*, *CRB* and *AOB* are straight lines.

Prove that angle *CAB* = angle *ABC*.

**(Total for Question 4 is 4 marks)**

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

**

Prove that the sum of angle *ABC* and angle *ADC* is 180°

**(Total for Question 5 is 4 marks)**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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Description automatically generated**6**

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*A*, *B* and *C* are points on a circle, centre *O*.

*CT* is the tangent to the circle at *C*.

Prove that angle *BAC* = angle *BCT*.

**(Total for Question 6 is 4 marks)**

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**TOTAL MARKS FOR PAPER: 23**