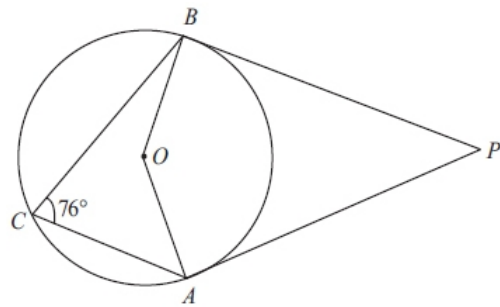## G206 Circle theorems

**Q1.**



Diagram **NOT** accurately drawn

*A*, *B* and *C* are points on a circle, centre *O*.
Angle *ACB* = 76°
*PA* and *PB* are tangents to the circle.
Calculate the size of angle *APB*.

.......................................................°
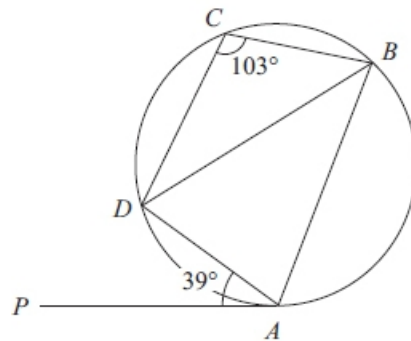
**(Total for question = 4 marks)**

**Q2.**



Diagram **NOT** accurately drawn

*A*, *B*, *C* and *D* are points on a circle.
*PA* is a tangent to the circle.
Angle *PAD* = 39°
Angle *BCD* = 103°
Calculate the size of angle *ADB*.

.......................................................°

**(Total for question = 3 marks)**

**Q3.**



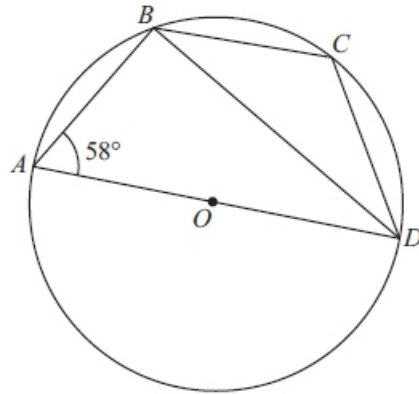Diagram **NOT** accurately drawn

*A*, *B*, *C* and *D* are four points on a circle, centre *O*.
*AD* is a diameter of the circle.
 Angle *BAD* = 58°
(a) Calculate the size of angle *ADB*.

....................................................°
**(2)**

(b) (i) Calculate the size of angle *BCD*.

....................................................°

 (ii) Give a reason for your answer.

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**(2)**

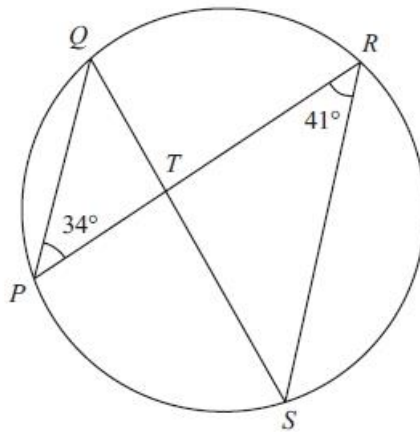**(Total for question = 4 marks)**

**Q4.**



Diagram **NOT** accurately drawn

*P*, *Q*, *R* and *S* are points on the circumference of a circle.
*PR* and *QS* intersect at *T*.
Angle *QPR* = 34° and angle *PRS* = 41°

(a) (i) Find the size of angle PQS.

................................................... °

(ii) Give a reason for your answer.

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**(2)**

(b) (i) Find the size of angle *PTS*.

................................................... °

(ii) Explain why *T* cannot be the centre of the circle.

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**(2)**

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

**Q5.**
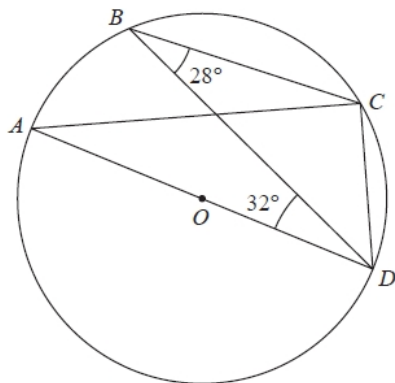


Diagram **NOT** accurately drawn

A, B, C and D are points on a circle, centre O.
AOD is a diameter of the circle.

Angle CBD = 28°
Angle BDA = 32°

Find the size of angle BDC.
Give a reason for each stage of your working.

......................................................... °

**(Total for question = 4 marks)**

**Q6.**
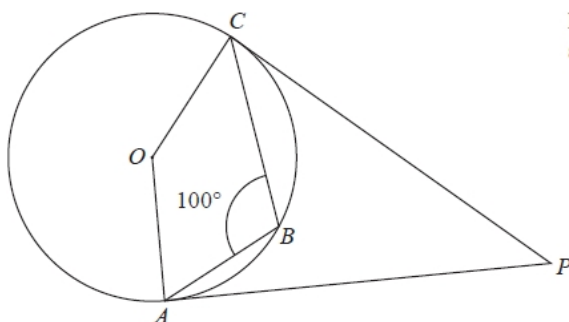


Diagram **NOT** accurately drawn

A, B and C are points on a circle, centre O.
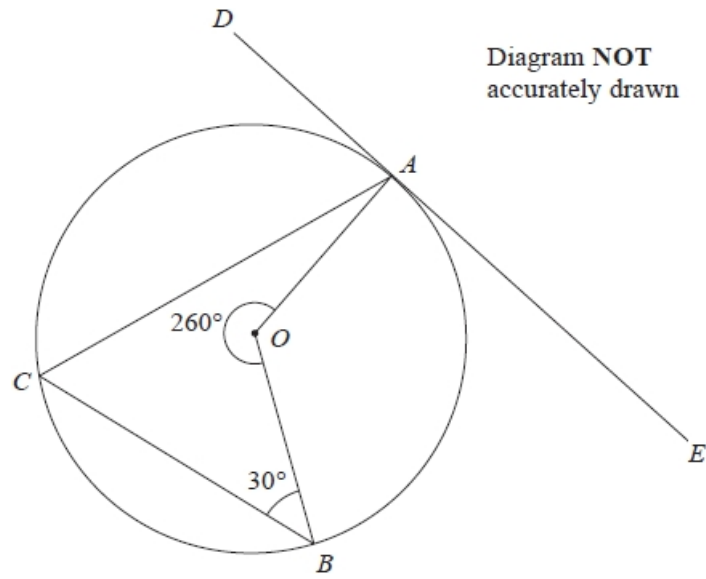PA and PC are tangents to the circle.
Angle ABC = 100°

Calculate the size of angle APC.

......................................................... °

**(Total for question = 3 marks)**

**Q7.**



Diagram **NOT** accurately drawn

$A$, $B$, and $C$ are points on the circumference of a circle, centre $O$.
$DAE$ is a tangent to the circle.
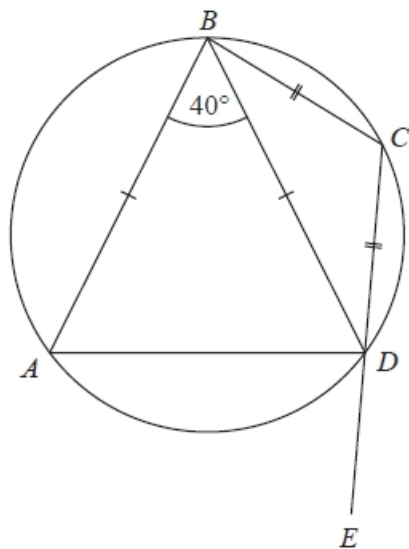
(a) Work out the size of angle $ACB$.

........................................................... °

(2)

(b) Work out the size of angle $CAD$.

........................................................... °

(2)

**(Total for question = 4 marks)**

**Q8.**

The points *A*, *B*, *C* and *D* lie on a circle.
*CDE* is a straight line.



*BA = BD*
*CB = CD*
Angle *ABD* = 40°

Work out the size of angle *ADE*.
You must give a reason for each stage of your working.
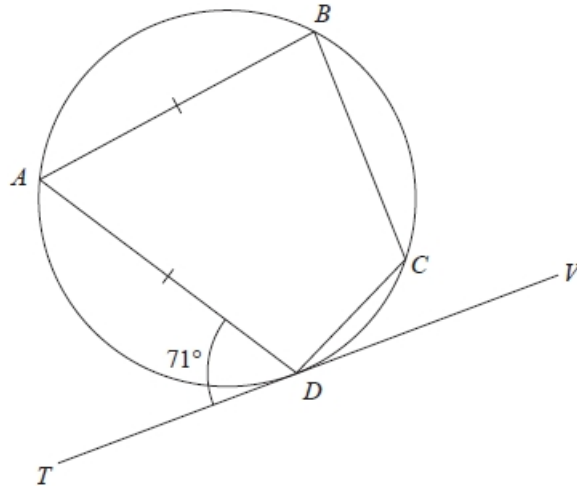
**(Total for question = 5 marks)**

**Q9.**



Diagram **NOT** accurately drawn

*A, B, C* and *D* are points on a circle.
TDV is the tangent to the circle at *D*.

*AB* = *AD*
Angle *ADT* = 71°

Work out the size of angle *BCD*.
Give a reason for each stage of your working.

...................................................... °
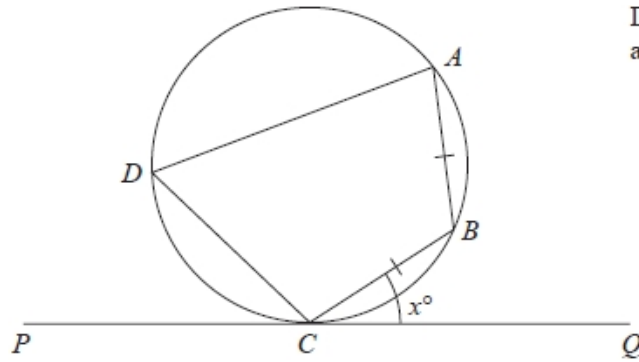
**(Total for question = 5 marks)**

**Q10.**



Diagram NOT accurately drawn

*A*, *B*, *C* and *D* are points on a circle.
*PCQ* is a tangent to the circle.
*AB* = *CB*.

Angle *BCQ* = *x*°

Prove that angle *CDA* = 2*x*°
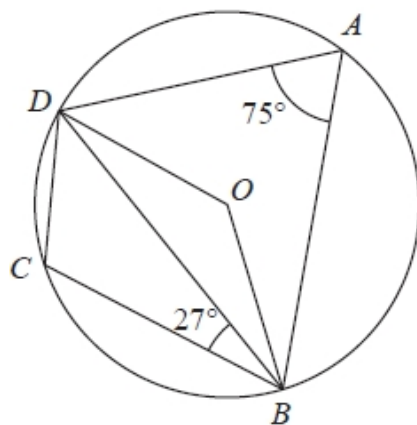Give reasons for each stage in your working.

**(Total for question = 5 marks)**

**Q11.**



Diagram **NOT** accurately drawn

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

Angle *DAB* = 75°
Angle *DBC* = 27°

Work out the size of angle *ODC*.

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**(Total for question = 4 marks)**

**Q12.**



Diagram **NOT** accurately drawn
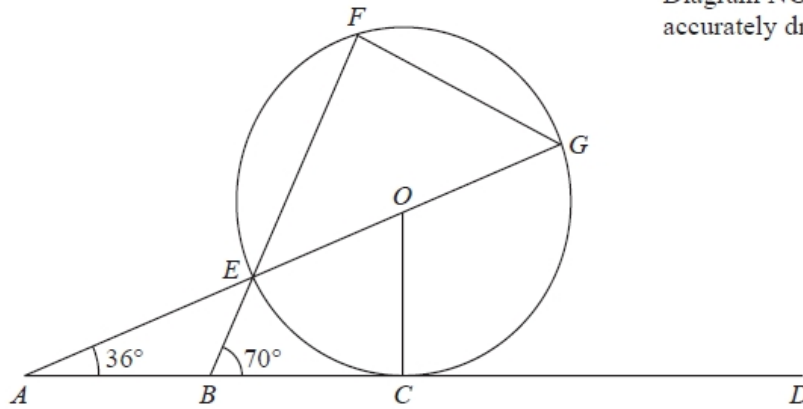
*ABCD* is the tangent at *C* to a circle, centre *O*.
*E*, *F* and *G* are points on the circle.
*AEOG* and *BEF* are straight lines.

Angle *BAE* = 36°
Angle *EBC* = 70°

(a) (i) Find the size of angle *AOC*.

........................................................... °

    (ii) Give reasons for your answer.

........................................................................................................................................

........................................................................................................................................

**(2)**

(b)   Find the size of angle *CGF*.

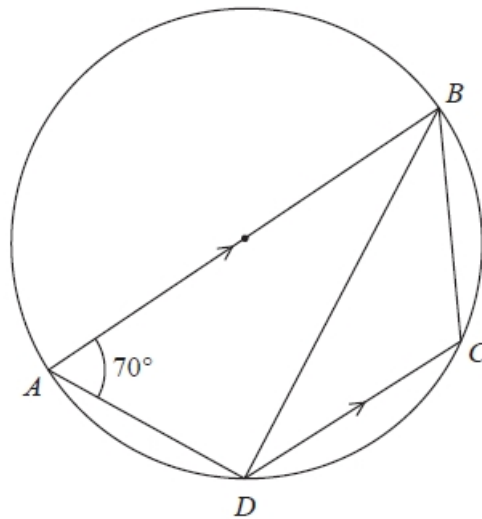........................................................... °

**(3)**

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

**Q13.**



Diagram **NOT** accurately drawn

*A*, *B*, *C* and *D* are points on a circle.
*AB* is a diameter of the circle.
*DC* is parallel to *AB*.
Angle *BAD* = 70°

(a) Calculate the size of angle *BDC*.

......................................................... °

(2)

The tangent to the circle at *D* meets the line *BC* extended at *T*.

(b) Calculate the size of angle *BTD*.

......................................................... °

(3)

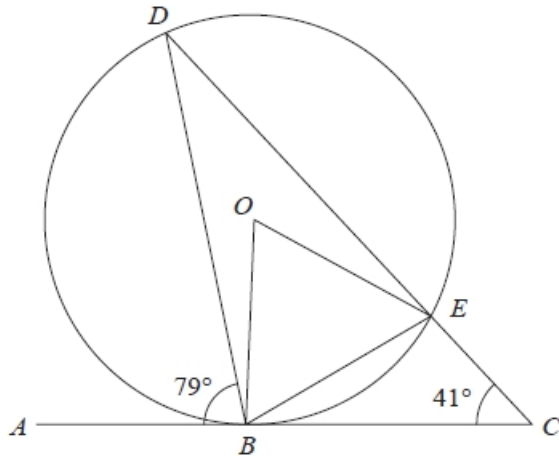**(Total for question = 5 marks)**

**Q14.**



Diagram **NOT** accurately drawn

$B$, $D$ and $E$ are points on a circle, centre $O$.
$ABC$ is a tangent to the circle.
$DEC$ is a straight line.
Angle $ABD = 79°$ and angle $ECB = 41°$
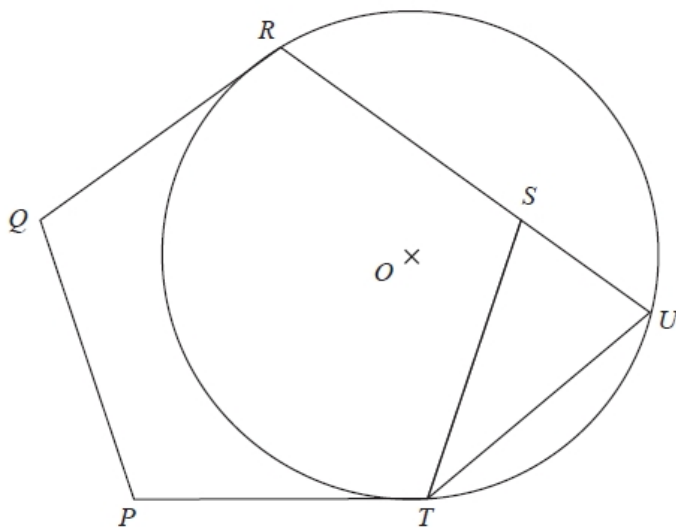
(a) Write down the size of angle $BED$.

..................................................... °

**(1)**

(b) Work out the size of angle $BOE$.

..................................................... °

**(2)**

**(Total for question = 3 marks)**

**Q15.**



*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*.

**(Total for question = 5 marks)**