5 In the diagram below, P and Q are points on a circle with centre O.

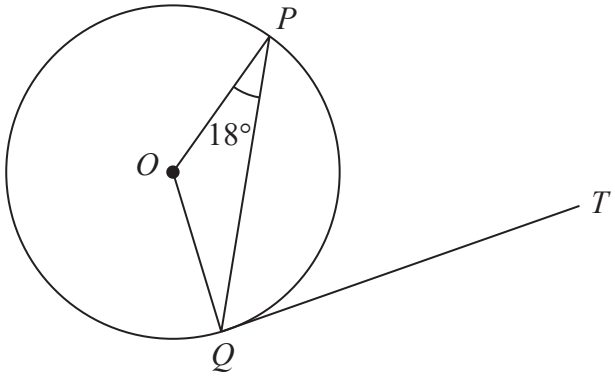

Diagram **NOT** accurately drawn

QT is a tangent to the circle.
Angle $OPQ = 18°$

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

.....°

(Total for Question 5 is 3 marks)

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7

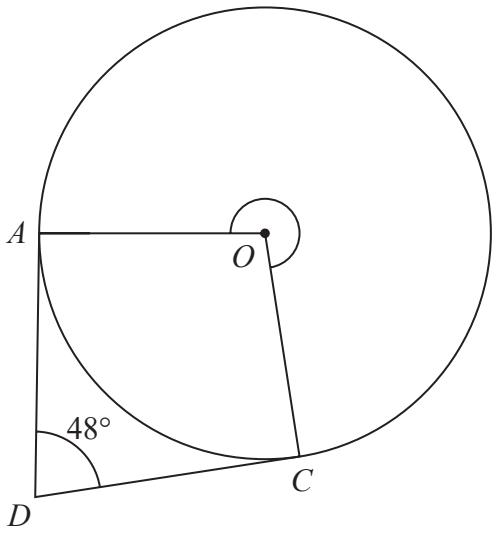

Diagram **NOT** accurately drawn

A and *C* are points on a circle, centre *O*
DA is the tangent to the circle at *A* and *DC* is the tangent to the circle at *C*

Angle *ADC* = 48°

Work out the size of reflex angle *AOC*

.....°

(Total for Question 7 is 3 marks)

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11

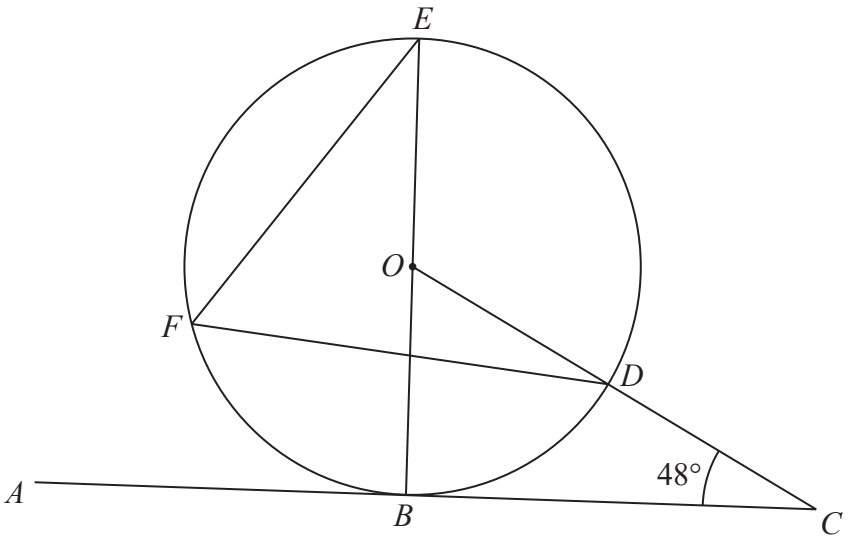

Diagram **NOT** accurately drawn

B, *D*, *E* and *F* are points on a circle, centre *O*.
ABC is a tangent to the circle.
ODC is a straight line.

BOE is a diameter of the circle.

Angle *BCD* = 48°

Find the size of angle *DFE*.

.....°

(Total for Question 11 is 3 marks)

12

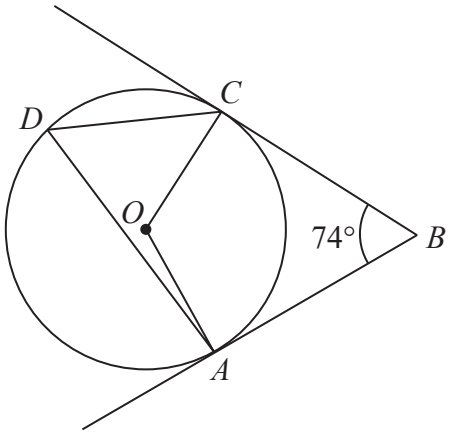

Diagram **NOT** accurately drawn

A, *C* and *D* are points on a circle, centre *O*.
AB and *CB* are tangents to the circle.

Angle *ABC* = 74°

Work out the size of angle *ADC*.
Show your working clearly.

.....°

(Total for Question 12 is 3 marks)

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13

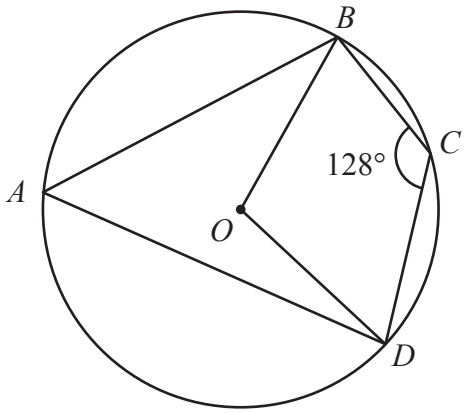

Diagram **NOT** accurately drawn

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

Angle *BCD* = 128°

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

angle *OBD* = ... °

(Total for Question 13 is 5 marks)

13

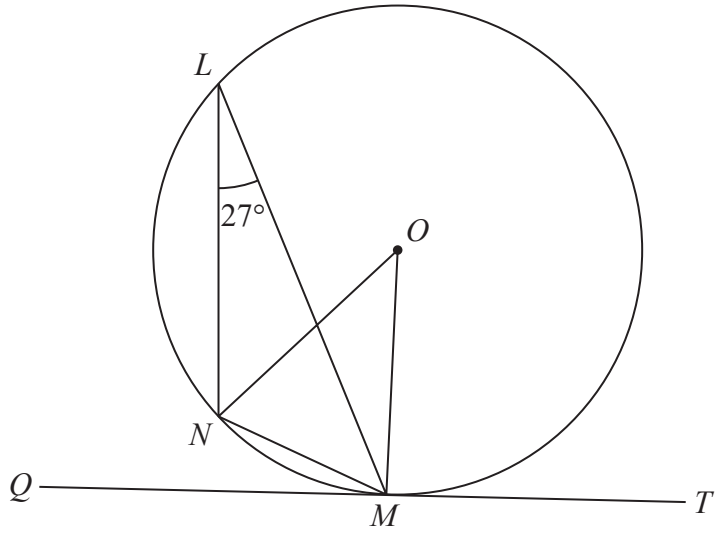

Diagram **NOT** accurately drawn

L, *M* and *N* are points on a circle, centre *O*.
QMT is the tangent to the circle at *M*.

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

.....°

(ii) Give a reason for your answer.

.....

.....

(2)

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

.....°

(ii) Give a reason for your answer.

.....

.....

(2)

(Total for Question 13 is 4 marks)

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13 *P*, *Q*, *R*, *S* and *T* are points on a circle with centre *O*.

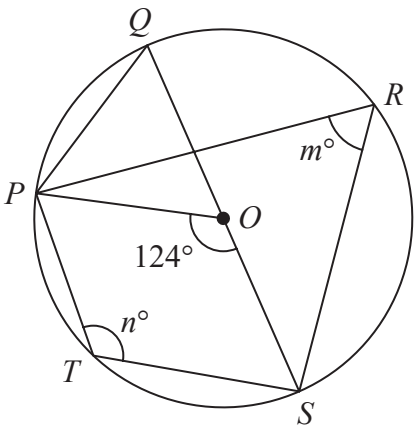

Diagram **NOT** accurately drawn

QOS is a diameter of the circle.

angle *POS* = 124° angle *PRS* = *m*° angle *PTS* = *n*°

(a) Find the value of

(i) *m*

.....

(ii) *n*

.....

(2)

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

..... °

(1)

(Total for Question 13 is 3 marks)

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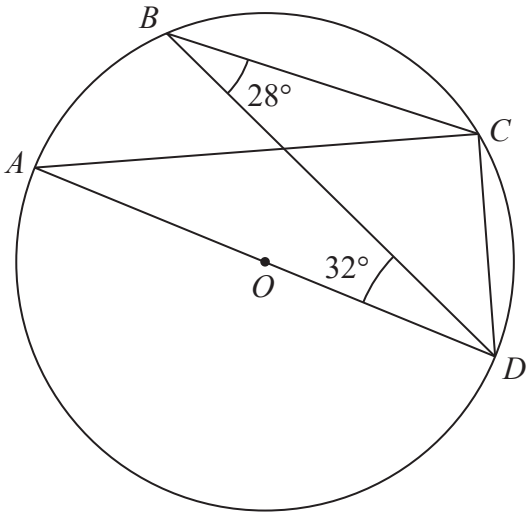

Diagram **NOT** accurately drawn

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 13 is 4 marks)

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14

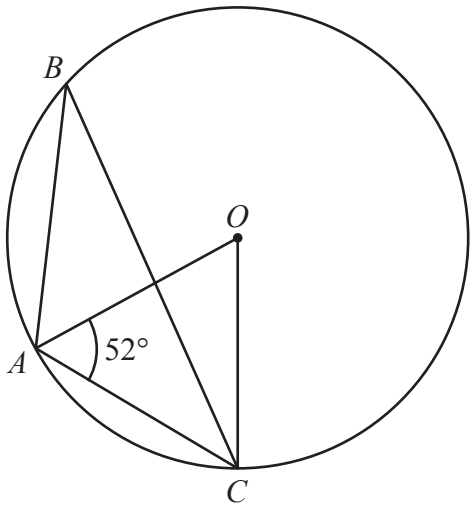

Diagram **NOT** accurately drawn

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

Angle $OAC = 52°$

Find the size of angle ABC
Give reasons for your working.

.....°

(Total for Question 14 is 3 marks)

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

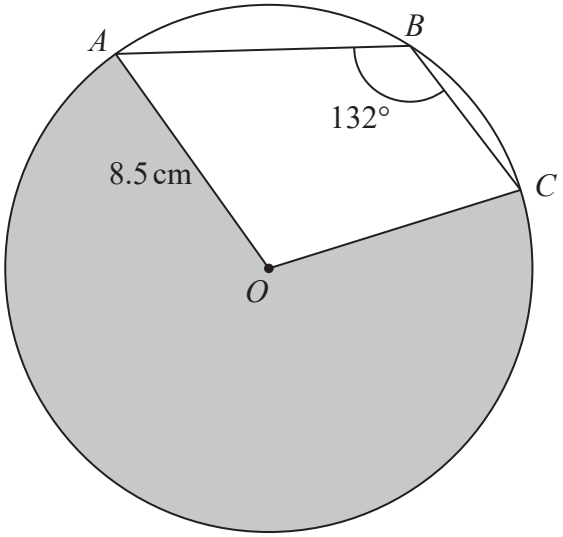

Diagram **NOT** accurately drawn

The radius of the circle is 8.5 cm
Angle $ABC = 132°$

Work out the perimeter of the shaded sector AOC
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 14 is 3 marks)

14

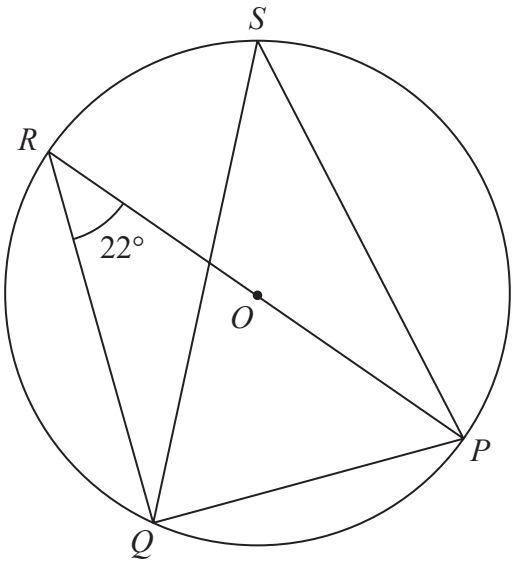

Diagram **NOT** accurately drawn

P, *Q*, *R* and *S* are points on a circle, centre *O*
ROP is a diameter of the circle.
Angle *PRQ* = 22°

(a) (i) Find the size of angle *RQP*

..... °

(1)

(ii) Give a reason for your answer.

.....

.....

(1)

(b) (i) Find the size of angle *PSQ*

..... °

(1)

(ii) Give a reason for your answer.

.....

.....

(1)

(Total for Question 14 is 4 marks)

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

EBF is the tangent to the circle at B

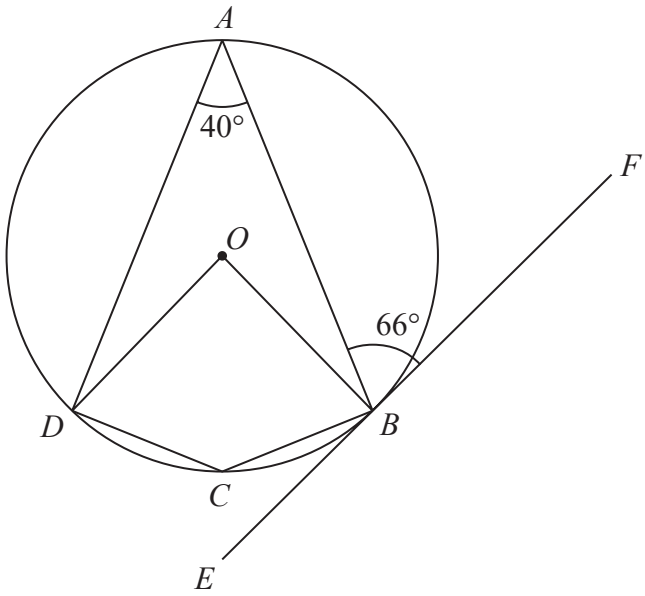

Diagram **NOT** accurately drawn

(a) (i) Work out the size of angle DCB

.....°

(1)

(ii) Give a reason for your answer to (a)(i)

.....

.....

(1)

(b) Work out the size of angle ADO

.....°

(3)

(Total for Question 14 is 5 marks)

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14

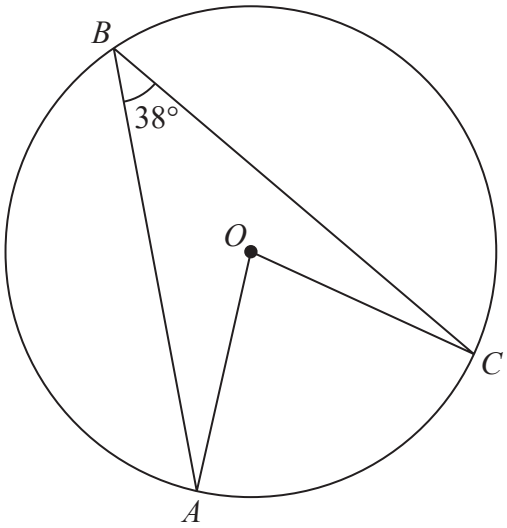

Diagram **NOT** accurately drawn

A, *B* and *C* are points on a circle, centre *O*.
Angle *ABC* = 38°

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

.....°

(Total for Question 14 is 4 marks)

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14

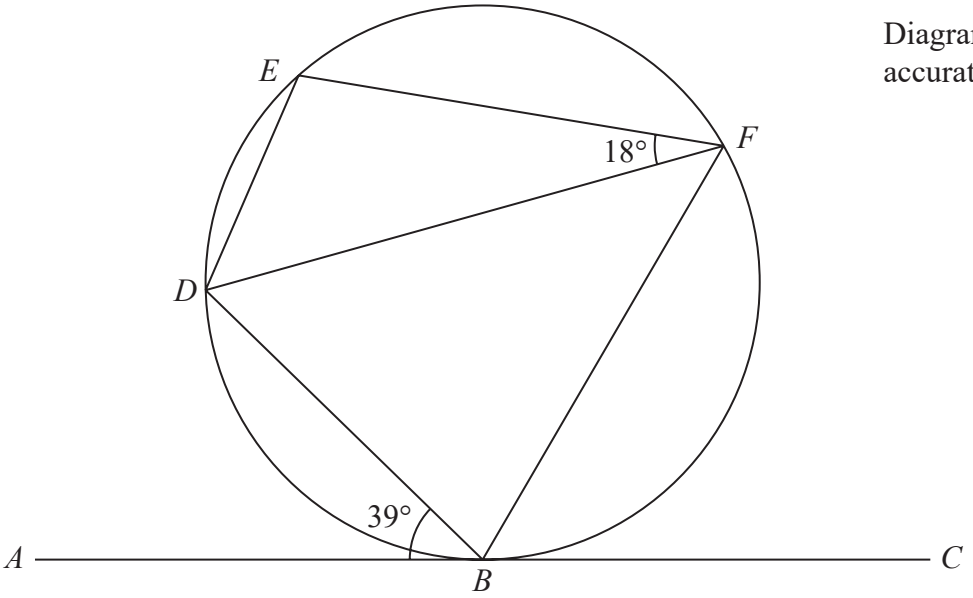

Diagram **NOT** accurately drawn

B, *D*, *E* and *F* are points on a circle.

ABC is the tangent at *B* to the circle.
Angle *ABD* = 39°
Angle *EFD* = 18°

Work out the size of angle *BDE*.
Give reasons for your working.

.....°

(Total for Question 14 is 4 marks)

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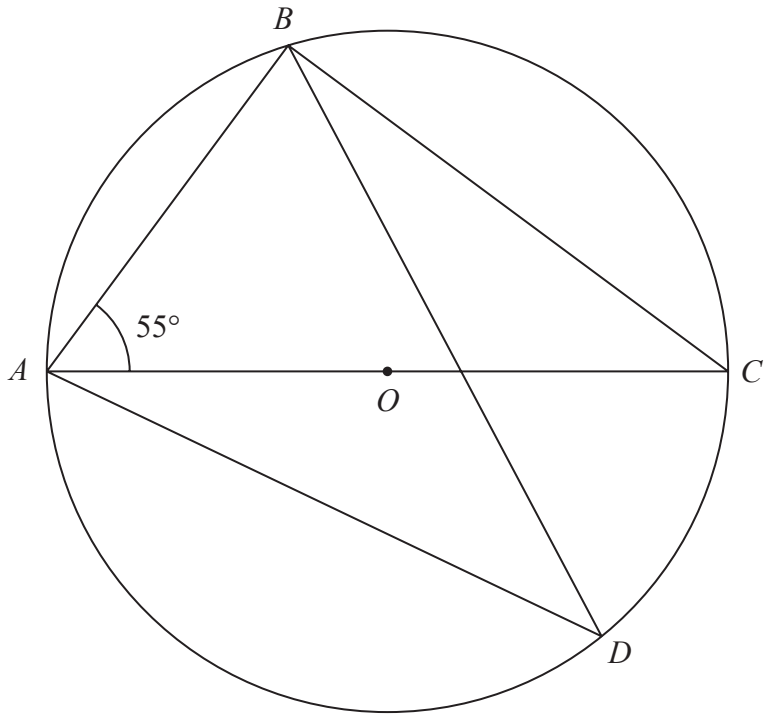

Diagram **NOT** accurately drawn

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

Angle *BAC* = 55°

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

.....°

(Total for Question 14 is 4 marks)

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

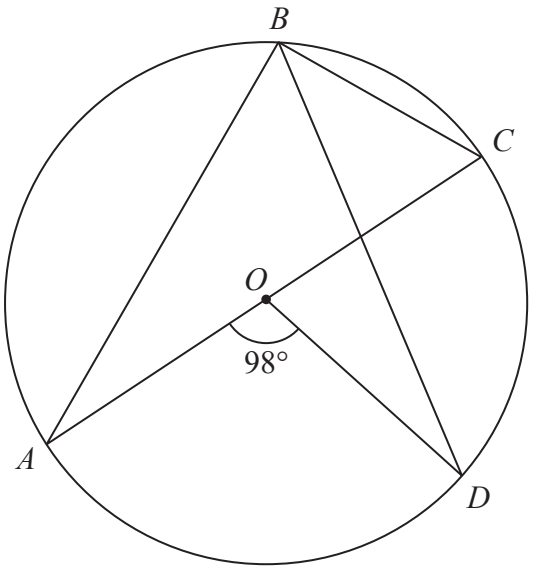

Diagram **NOT** accurately drawn

AOC is a diameter of the circle.

Angle *AOD* = 98°

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

.....°

(Total for Question 15 is 4 marks)

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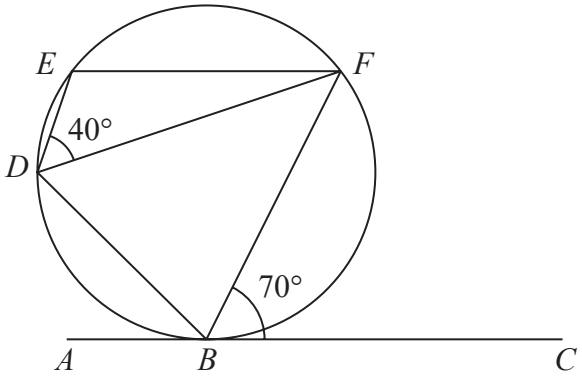

Diagram **NOT** accurately drawn

B, *D*, *E* and *F* are points on a circle.
ABC is the tangent to the circle at *B*.

Angle *EDF* = 40°
Angle *FBC* = 70°

Prove that the tangent *ABC* is parallel to *EF*.
Give a reason for each stage of your working.

(Total for Question 15 is 4 marks)

15 P, Q and R are points on a circle, centre O.
TRV is the tangent to the circle at R.

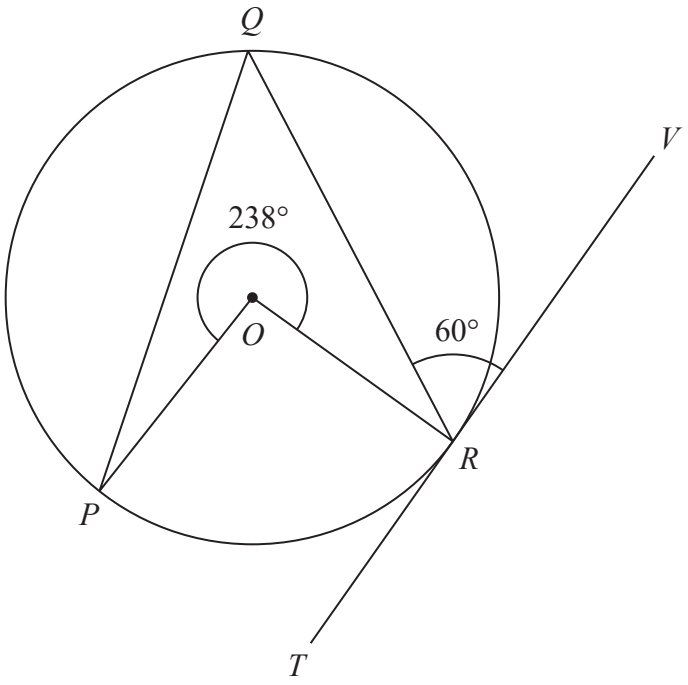

Diagram **NOT** accurately drawn

Reflex angle $POR = 238°$
Angle $QRV = 60°$

Calculate the size of angle OPQ.
Give a reason for each stage of your working.

.....°

(Total for Question 15 is 4 marks)

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15

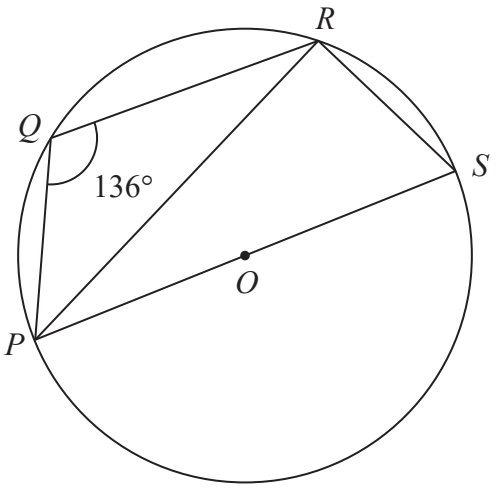

Diagram **NOT** accurately drawn

P, *Q*, *R* and *S* are points on a circle with centre *O*

PS is a diameter of the circle.

Angle *PQR* = 136°

Work out the size of angle *RPS*

.....°

(Total for Question 15 is 3 marks)

16

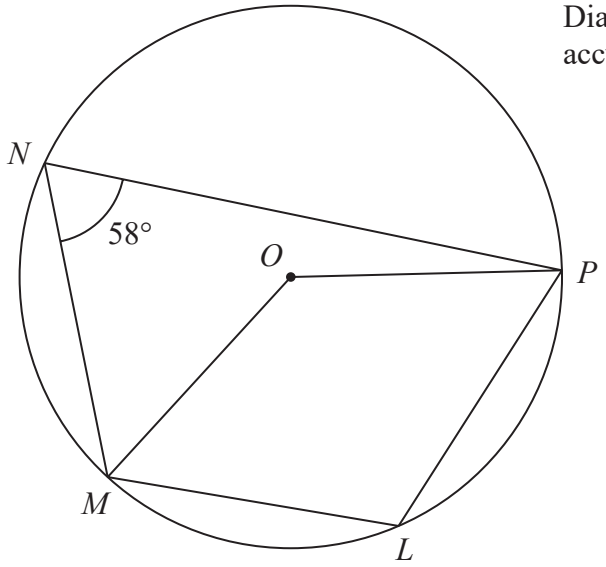

Diagram **NOT** accurately drawn

L, *M*, *N* and *P* are points on a circle, centre *O*

Angle *MNP* = 58°

(a) (i) Find the size of angle *MLP*

.....°

(ii) Give a reason for your answer.

.....

.....

(2)

(b) Find the size of the reflex angle *MOP*

.....°

(2)

(Total for Question 16 is 4 marks)

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

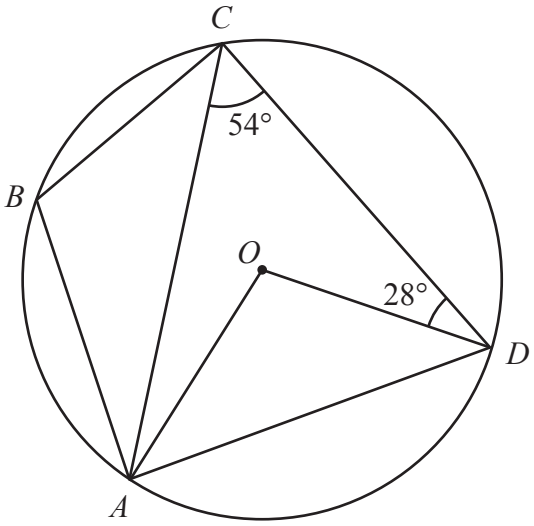

Diagram **NOT** accurately drawn

(a) (i) Work out the size of angle *AOD*

.....°

(1)

(ii) Give a reason for your answer to part (a)(i)

.....

.....

(1)

(b) Work out the size of angle *CAO*

.....°

(1)

(c) Work out the size of angle *ABC*

.....°

(2)

(Total for Question 16 is 5 marks)

16 D, E, F and G are points on a circle, centre O

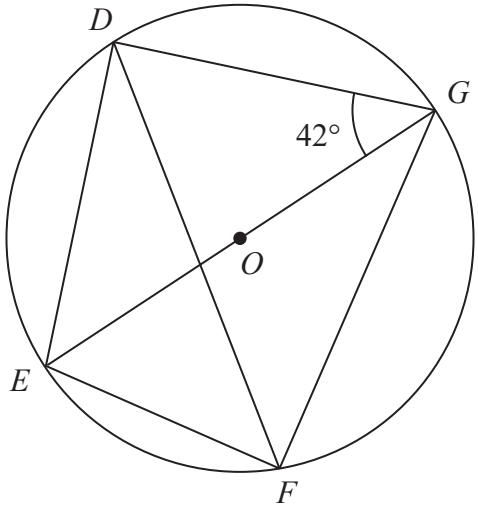

Diagram **NOT** accurately drawn

EOG is a diameter of the circle.

Angle $EGD = 42°$

Calculate the size of angle DFG
Give a reason for each stage of your working.

Angle DFG = ... °

(Total for Question 16 is 4 marks)

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16

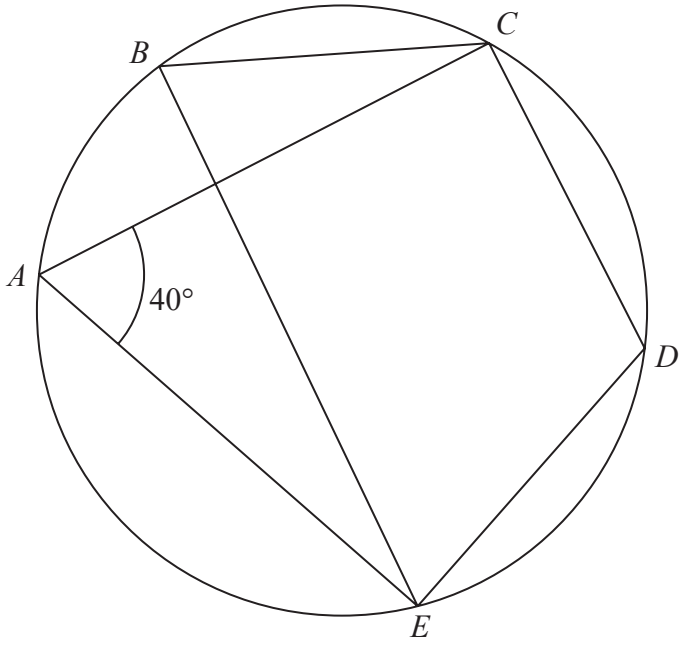

Diagram **NOT** accurately drawn

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

Angle *EAC* = 40°

(a) (i) Write down the size of angle *EBC*.

..... °

(1)

(ii) Give a reason for your answer.

.....

(1)

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

..... °

(1)

(Total for Question 16 is 3 marks)

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18

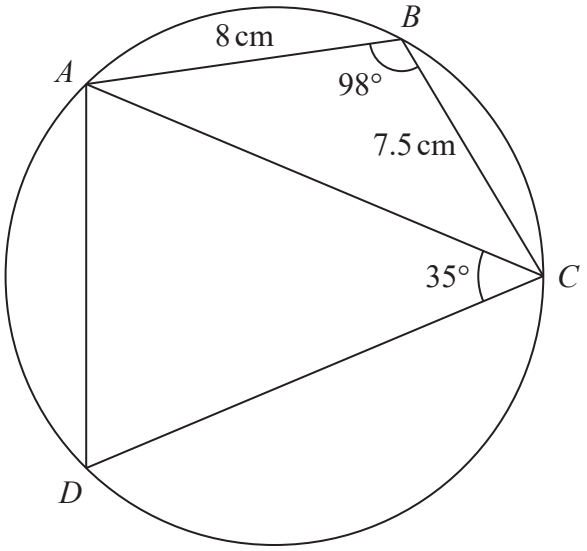

Diagram **NOT** accurately drawn

ABCD is a quadrilateral where *A*, *B*, *C* and *D* are points on a circle.

AB = 8 cm
BC = 7.5 cm
Angle *ABC* = 98°
Angle *ACD* = 35°

Work out the perimeter of quadrilateral *ABCD*.
Give your answer correct to one decimal place.

..... cm

(Total for Question 18 is 6 marks)

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19

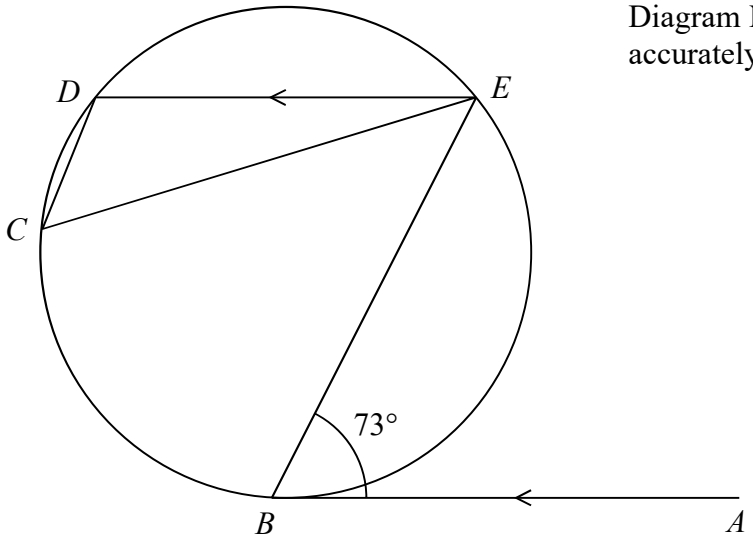

Diagram **NOT** accurately drawn

B, *C*, *D* and *E* are points on a circle.

AB is the tangent at *B* to the circle.
AB is parallel to *ED*.
Angle *ABE* = 73°

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

°

(Total for Question 19 is 5 marks)

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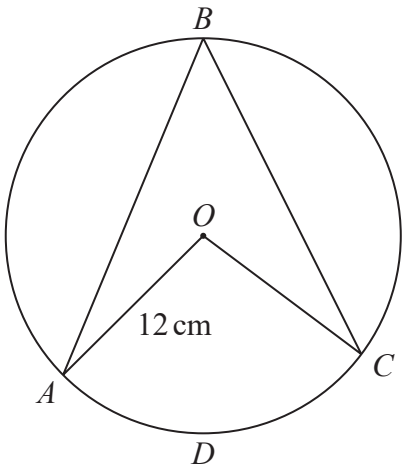

Diagram **NOT** accurately drawn

A, *B*, *C* and *D* are points on a circle with centre *O* and radius 12 cm.

The area of the sector *OADC* of the circle is 100 cm^2

Work out the size of angle *ABC*.
Give your answer correct to 3 significant figures.

.....°

(Total for Question 19 is 4 marks)

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20 A, B and C are points on a circle.

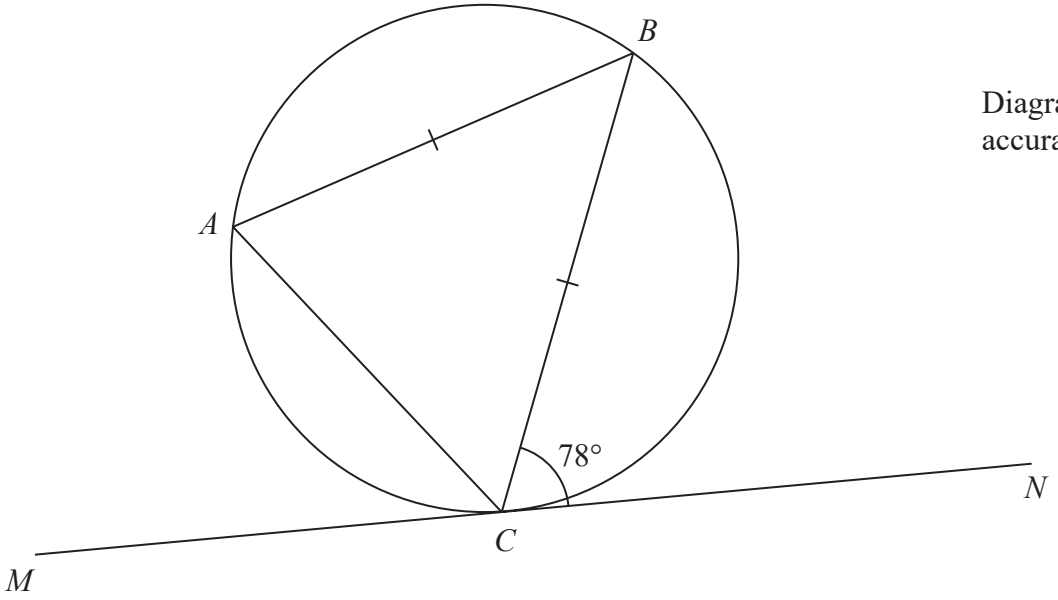

Diagram **NOT** accurately drawn

MN is the tangent to the circle at C

$AB = CB$

Angle $BCN = 78°$

Find the size of angle ABC

.....°

(Total for Question 20 is 2 marks)

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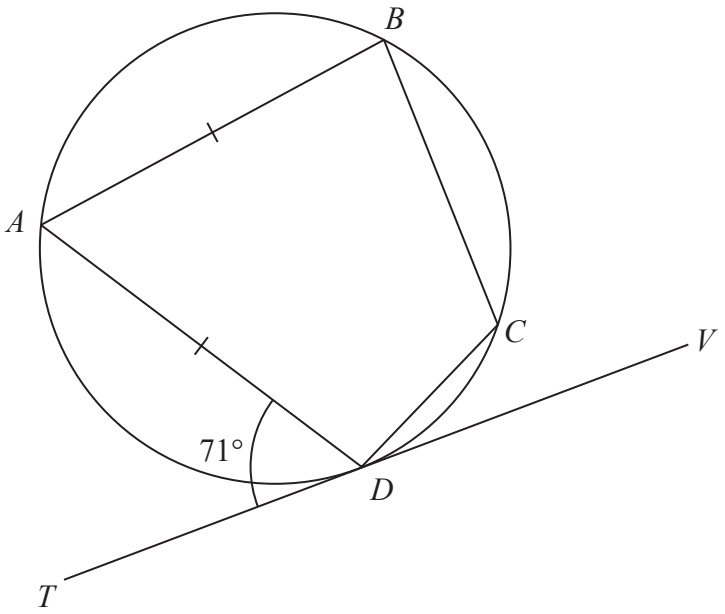

Diagram **NOT** accurately drawn

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 20 is 5 marks)

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20

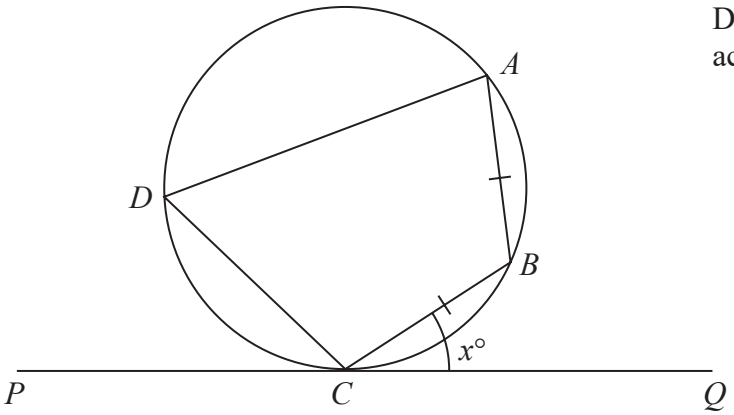

Diagram **NOT** accurately drawn

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 $CDA = 2x°$
Give reasons for each stage in your working.

(Total for Question 20 is 5 marks)

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

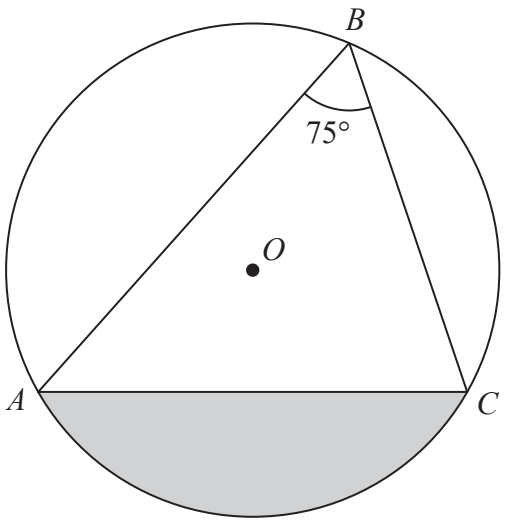

Diagram **NOT** accurately drawn

Angle $ABC = 75°$

The area of the shaded segment is $200\,cm^2$

Calculate the radius of the circle.
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 20 is 5 marks)

23

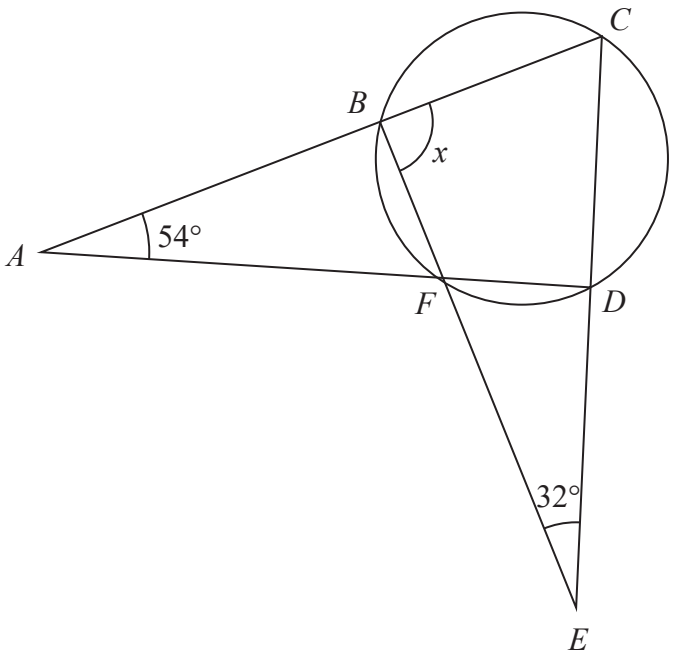

Diagram **NOT** accurately drawn

B, *C*, *D* and *F* are points on a circle.
ABC, *AFD*, *BFE* and *CDE* are straight lines.

Work out the size of angle *x*.
Show your working clearly.

x = ... °

(Total for Question 23 is 4 marks)

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