Surname	
Other Names	
Candidate's Signature	

GCSE 9 - 1 Questions

Circle Theorems

Calculator Allowed

INSTRUCTIONS TO CANDIDATES

Write your name in the space provided.

Write your answers in the spaces provided in this question paper.

Answer ALL questions.

Any working should be clearly shown in the spaces provided since marks may be awarded for partially correct solutions.

You should have a ruler, compass and protractor where required.

Total Marks :

1)

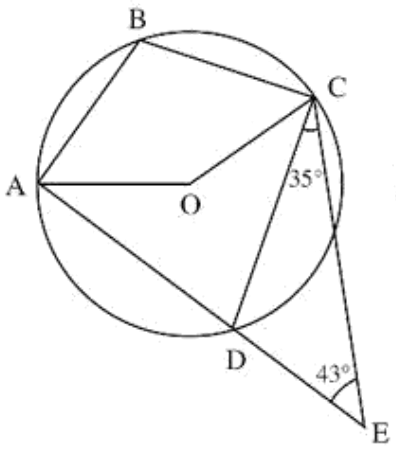


Diagram not drawn accurately

A, B, C and D are points on the circumference of a circle, centre O.
ADE and CE are straight lines. Angle DCE = 35° and angle DEC = 43°.
Calculate the size of

(a) the angle ABC,

Answer _____° [2]

(b) the obtuse angle AOC.

Answer _____° [1]

2)

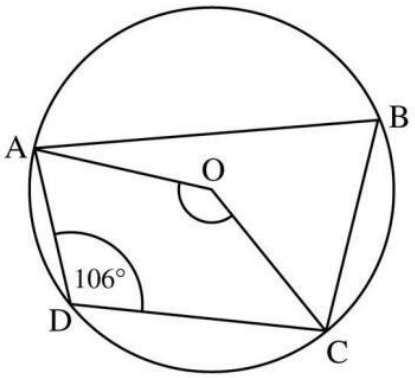


Diagram not drawn accurately

A, B, C and D are points on the circumference of a circle, centre O.
The angle ADC is 106°
Calculate

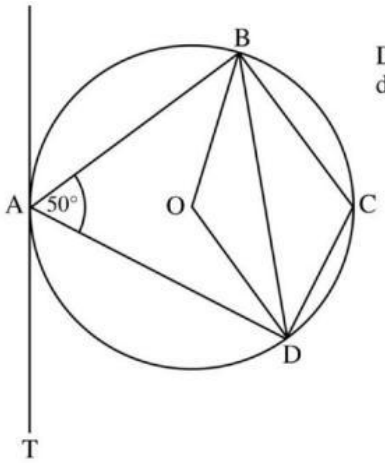
(i) the angle ABC

Answer _____° [1]

(ii) the marked angle AOC.

Answer _____° [1]

3)



O is the centre of a circle and A, B, C and D are points on the circumference of the circle.
TA is a tangent to the circle.
Angle BAD is 50°
Calculate the size of

(a) angle OAT,

Answer _____° [1]

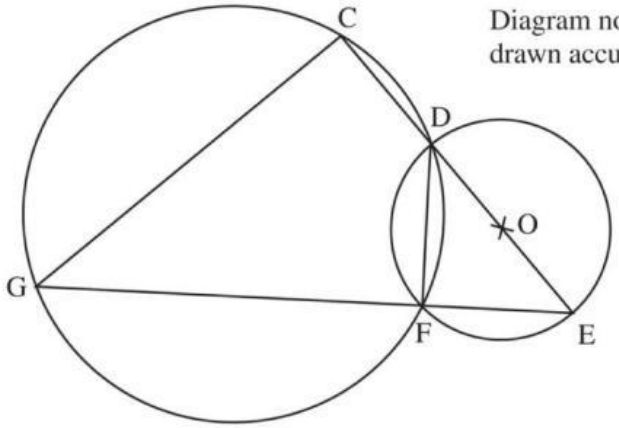
(b) angle BCD,

Answer _____° [1]

(c) angle BOD.

Answer _____° [1]

4)



C, D, F and G are points on the circumference of the large circle.
The circle, centre O, has diameter DE.
The two circles intersect at D and F.
CDE and GFE are straight lines.

Find

(a) angle DFE.

Answer _____° [1]

(b) Explain why angle DCG is a right angle.

_____

_____ [2]

Angle CGF is 40°.

(c) Calculate angle EDF.

Answer _____° [2]

5) The diagram shows a circle with centre O.

A, B and C are three points on the circumference of the circle.

Angle AOC is 130°

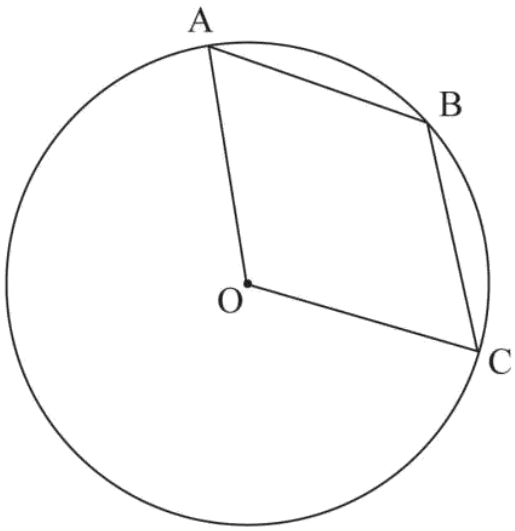


Diagram not drawn accurately.

(i) Explain why angle ABC is 115°

[2]

(ii) The lengths AB and OB are equal. Calculate angle OBC.

Answer _____ ° [1]

6)

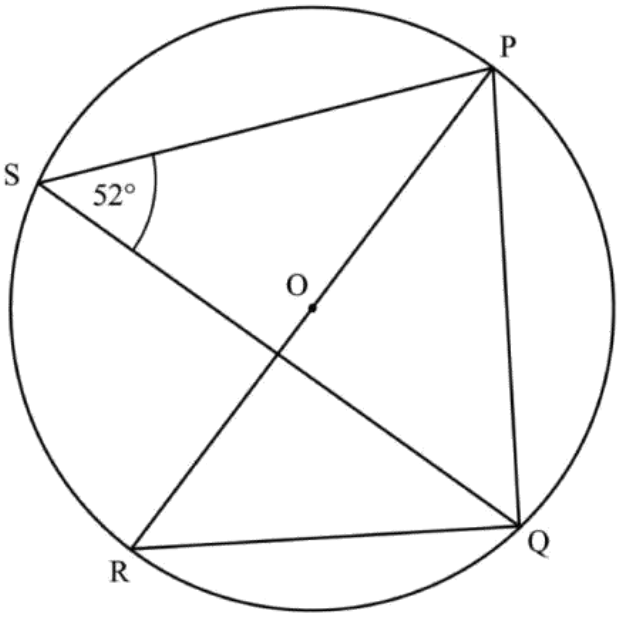


Diagram not drawn accurately

O is the centre of the circle.

(a) Explain why angle PQR = 90°

_____ [1]

(b) Calculate

(i) angle PRQ, Answer _____° [1]

(ii) angle POQ. Answer _____° [1]

7) The diagram shows a circle with $DC = 30\,\text{cm}$, $ED = 40\,\text{cm}$ and $BC = 35\,\text{cm}$.

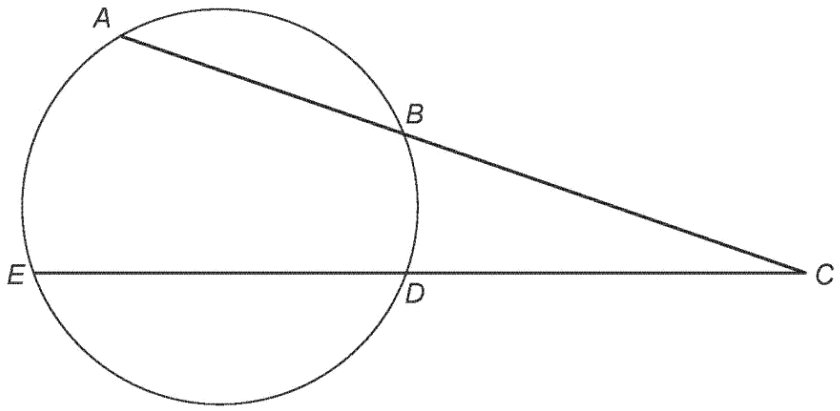


Diagram not drawn to scale

Calculate the length of AB. [4]

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8) The points A, B and C lie on the circumference of a circle, centre O.

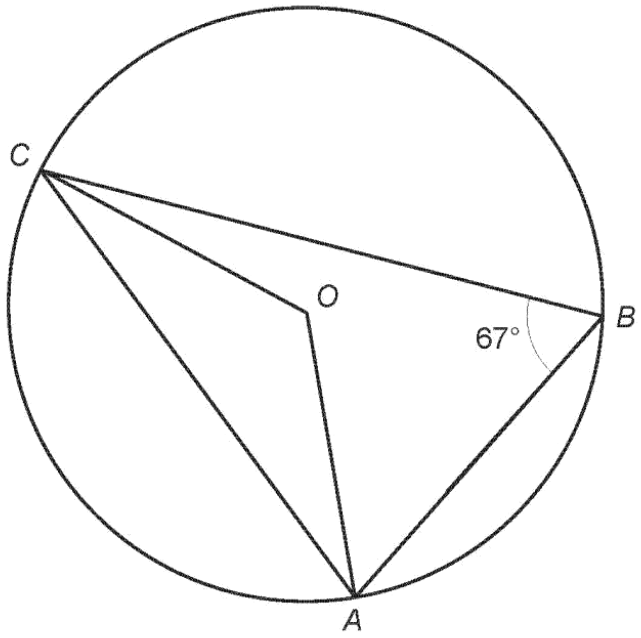

Diagram not drawn to scale

Find the size of $O\hat{A}C$. [3]

9)

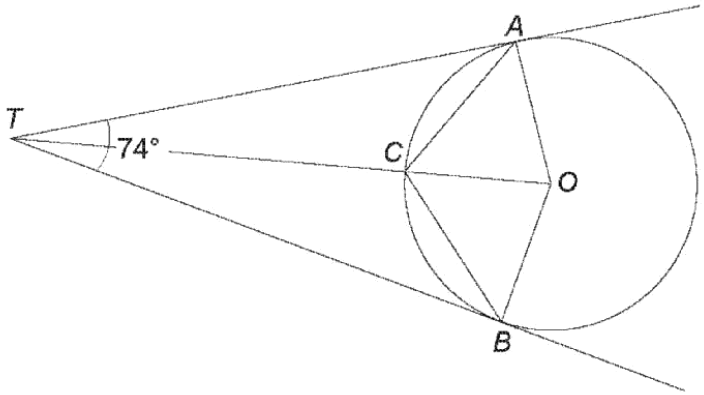

Diagram not drawn to scale

The diagram shows a circle with centre O.

AT and BT are tangents to the circle and $\widehat{ATB} = 74°$.

(a) Calculate the size of each of the following angles.

(i) $\widehat{AOT}$ [2]

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(ii) $\widehat{OBC}$ [2]

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(iii) $\widehat{ACB}$ [1]

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(b) The radius of the circle is 8 cm.
Calculate the perimeter of the quadrilateral *TAOB*. [4]

10)

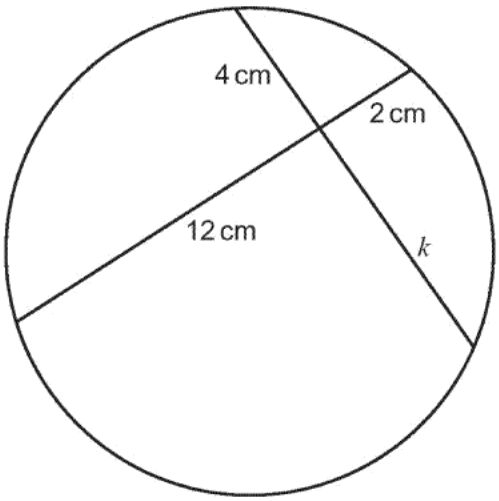

Diagram not drawn to scale

Find the length of the line marked k. [2]

11) The points A, B, C and D lie on the circumference of a circle, centre O.
EF is a tangent to the circle at C.
$AB = AC$.
$\hat{BCE} = 38°$ and $\hat{ACD} = 41°$.

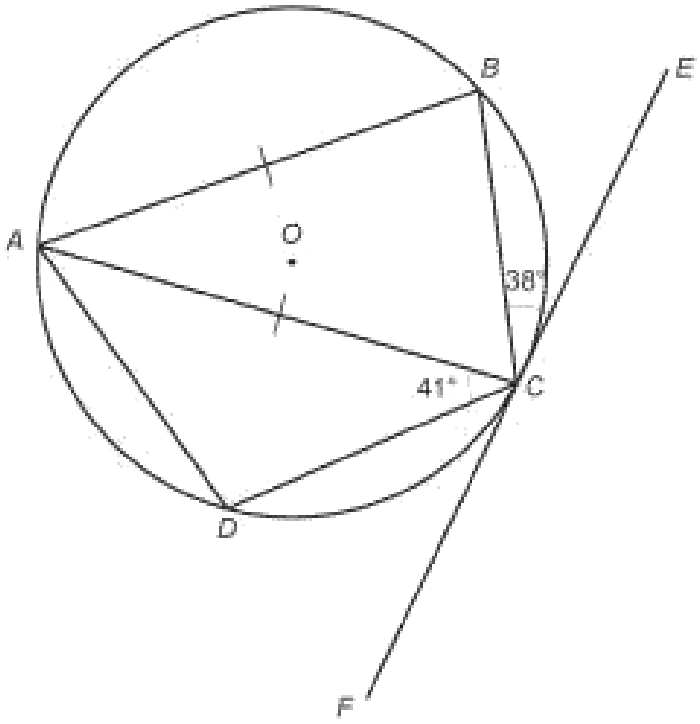

Diagram not drawn to scale

Write down the size of

(a) $\hat{BAC}$ [1]

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(b) $\hat{ABC}$ [1]

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(c) $\hat{ADC}$ [1]

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(d) $C\hat{O}B$ [1]

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12)

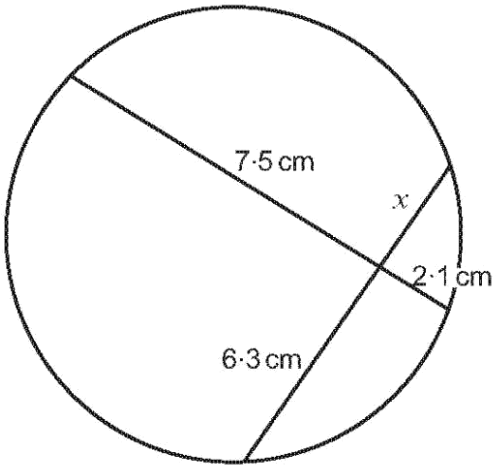

Diagram not drawn to scale

Calculate the length x. [2]

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13) *(a)* Calculate the length a. [2]

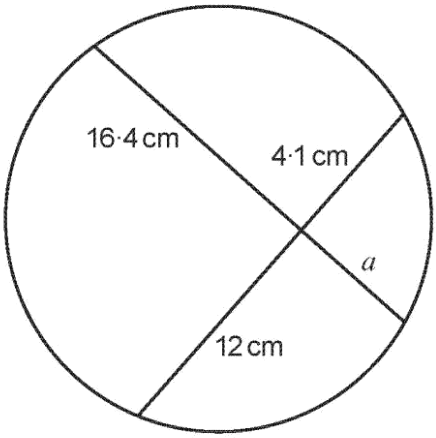

Diagram not drawn to scale

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a = ... cm

(b) PT is a tangent to the circle.

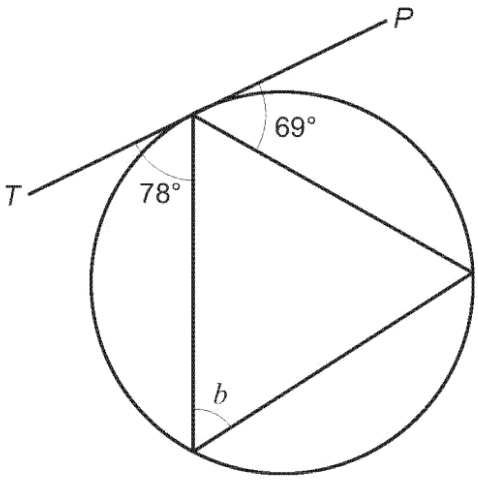

Diagram not drawn to scale

Find the size of the angle b. [1]

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b = ... °

14) *(a)* The diagram shows a circle with centre *O* and a tangent *TAP*.
The points *A*, *B* and *C* lie on the circumference of the circle.

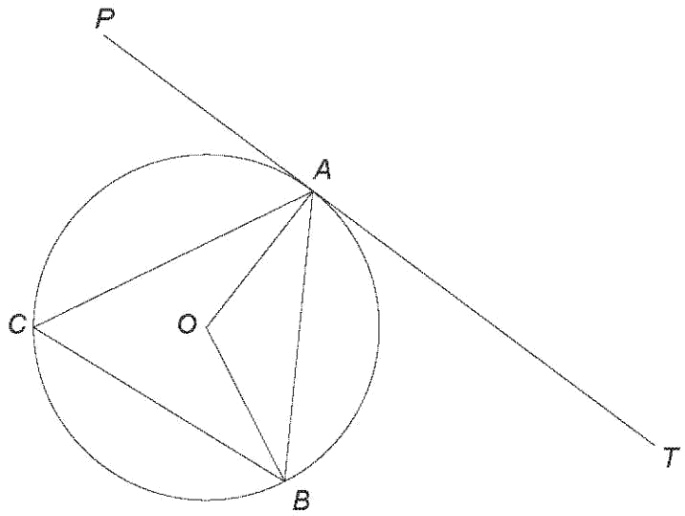

Diagram not drawn to scale

Given that $\hat{TAB} = 50°$, calculate the **reflex** angle $\hat{AOB}$.
You must show all your working. [3]

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(b) The points *B*, *C*, *D* and *E* lie on the circumference of another circle.
The point *A* lies outside the circle.
ABE and *ACD* are straight lines.

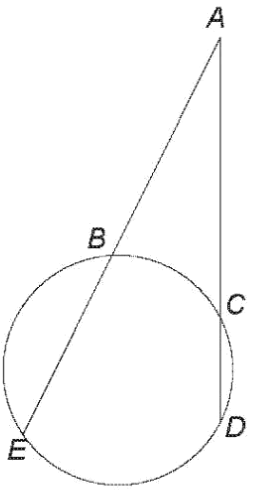

Diagram not drawn to scale

Given that *AB* = 9 cm, *AC* = 10 cm and *CD* = 8 cm, calculate the length of *BE*. [2]

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15) The diagram shows two circles of equal radii with centres A and B joined with a straight line.
The line TSP is a tangent to both circles.
S lies on the circumference of both circles.
E and F lie on the circumference of one of the circles.
G and H lie on the circumference of the other circle.

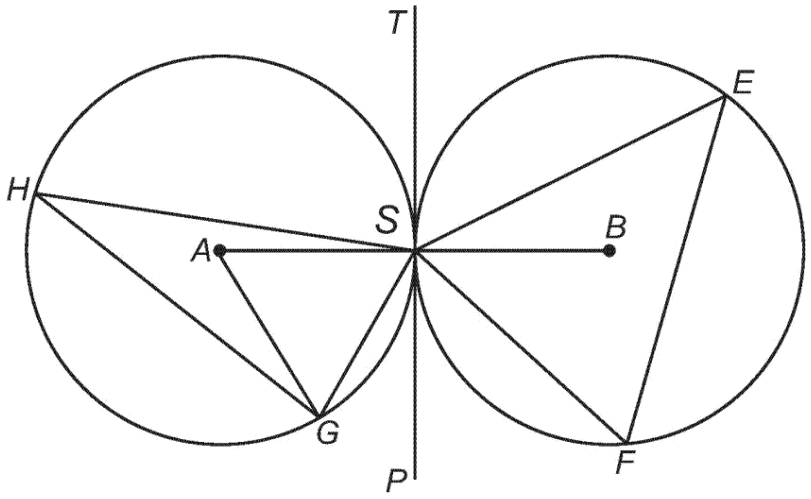

Diagram not drawn to scale

You are given that $S\hat{E}F = 2x°$ and $G\hat{S}P = x°$.

(a) State the size of each of the following angles in terms of x.

(i) $G\hat{S}F$. [1]

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(ii) $A\hat{S}G$. [1]

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(iii) $S\hat{A}G$. [1]

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(b) J is the mid-point on the minor arc of the circle between S and F.
State the size of $S\hat{J}F$ in terms of x.
Give the reason for your answer. [2]

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16) The points A, B, C and D lie on the circumference of a circle, centre O.
Triangle ABC is **equilateral**.
EF is a tangent to the circle at A.
$A\hat{C}D = 46°$.

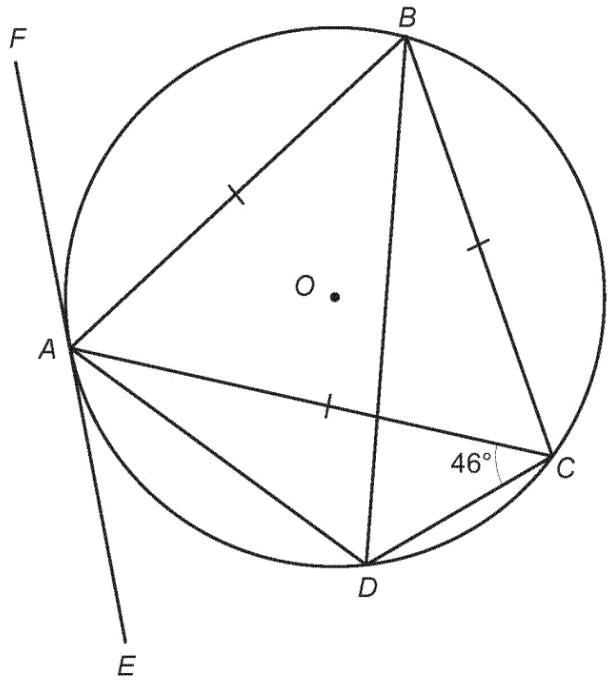

Diagram not drawn to scale

Write down the size of

(a) $A\hat{B}D$ [1]

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(b) $C\hat{A}E$ [1]

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(c) $A\hat{O}B$ [1]

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(d) $B\hat{A}D$ [1]

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17) The diagram shows a circle with $BC = 30\,\text{cm}$, $AB = 50\,\text{cm}$ and $CD = 25\,\text{cm}$.

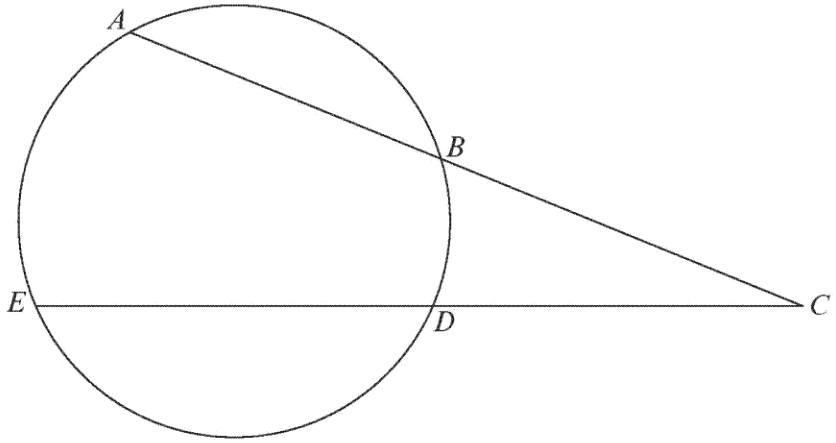

Diagram is not drawn to scale

Calculate the length of ED.

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[4]