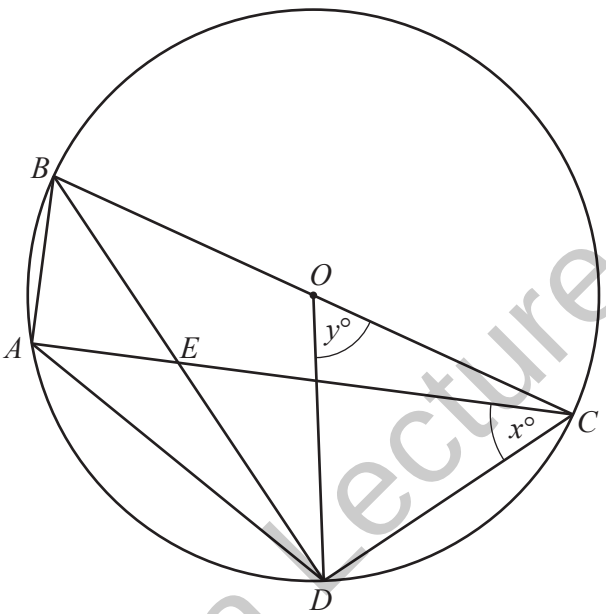
PapaCambridge Name:

Section:

Angle Properties of Circles

1



NOT TO SCALE

Mega Lecture

A, B, C and D are points on the circumference of a circle, centre O.
BD and AC intersect at E and BC is a diameter of the circle.
$A\hat{C}D = x°$ and $D\hat{O}C = y°$.

Find an expression, in terms of x and/or y, for

(i) $D\hat{B}C$,

$D\hat{B}C =$ ..... [1]

(ii) $A\hat{B}D$,

$A\hat{B}D =$ ..... [1]

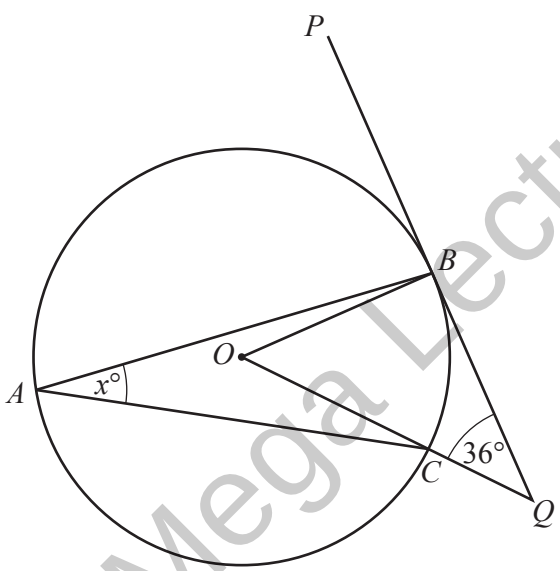
(iii) $A\hat{E}D$,

$A\hat{E}D =$ ..... [2]

(iv) $B\hat{D}A$.

$B\hat{D}A =$ ..... [1]

2



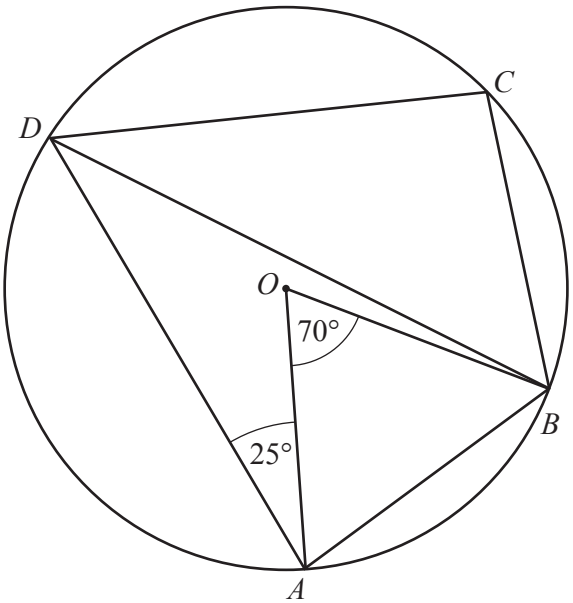
NOT TO SCALE

Mega Lecture

A, B and C lie on a circle, centre O.
The line PBQ is a tangent to the circle at B.
OCQ is a straight line.
$B\hat{Q}O = 36°$ and $B\hat{A}C = x°$.

Find the value of x.

3



NOT TO SCALE

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

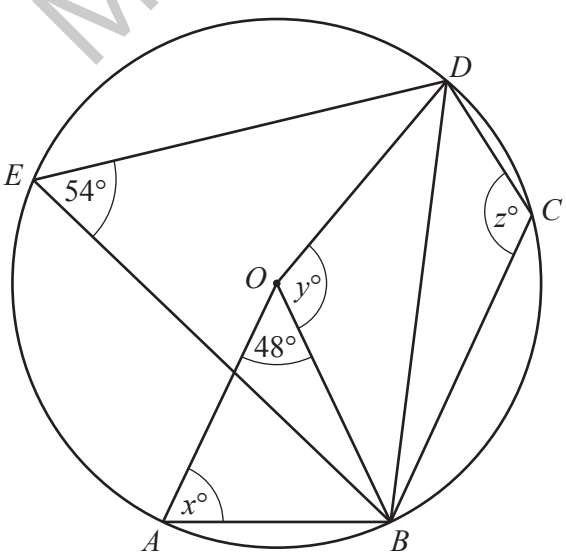
(a) Find $A\hat{D}B$.

$A\hat{D}B =$ ..... [1]

(b) Find $B\hat{C}D$.

$B\hat{C}D =$ ..... [2]

4



NOT TO SCALE

In the diagram, A, B, C, D and E lie on the circle, centre O.
$A\hat{O}B = 48°$, $D\hat{E}B = 54°$.

Mega Lecture

(a) Find x.

$x =$ ..... [2]

(b) Find y.

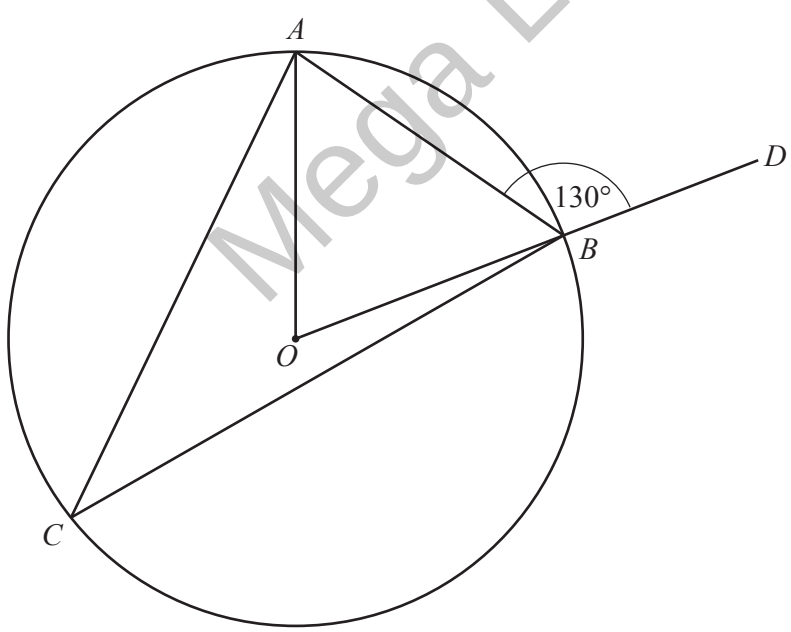
$y =$ ..... [1]

(c) Find z.

$z =$ ..... [1]

Mega Lecture

5 **(a)**



NOT TO SCALE

A, B and C are points on the circumference of a circle, centre O.
OBD is a straight line and angle $ABD = 130°$.

Find angle ACB, giving a reason for each step of your working.

.....

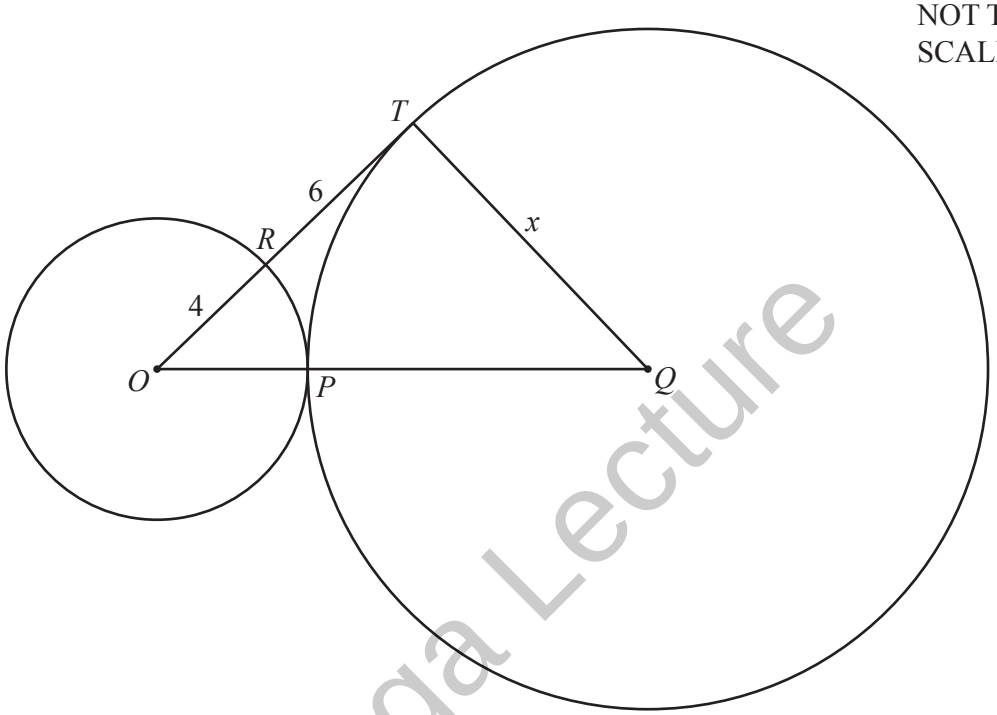
.....

.....

ACB = ... [3]

6

NOT TO SCALE



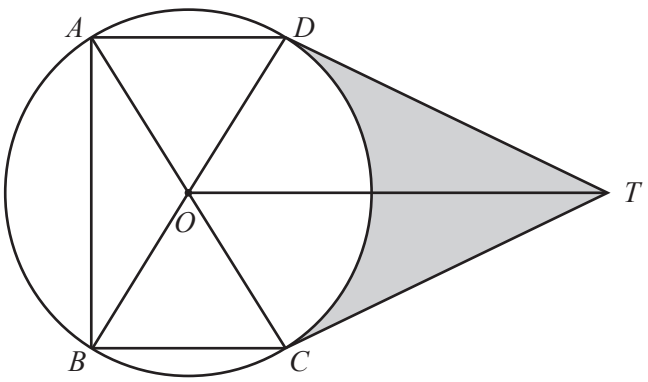
Mega Lecture

In the diagram, the circles with centres *O* and *Q* touch at *P* where *OPQ* is a straight line.
The line *ORT* intersects the smaller circle at *R* and is a tangent to the larger circle at *T*.

OR = 4 cm and *RT* = 6 cm.
The radius of the larger circle is *x* cm.

Calculate the value of *x*.

7



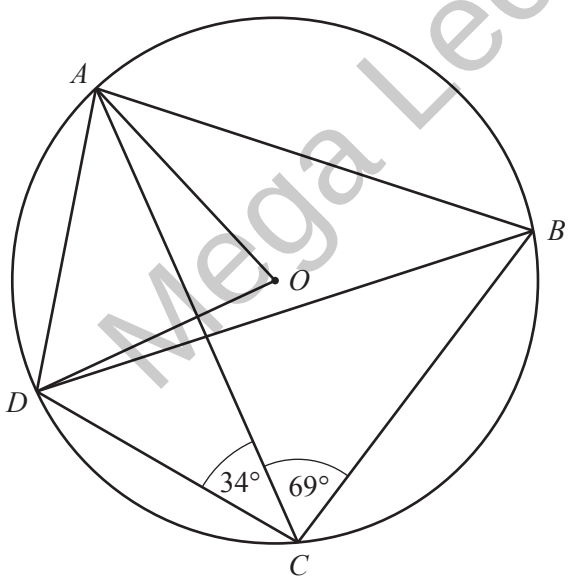
NOT TO SCALE

Two tangents, TC and TD, are drawn to the circle in **part (a)**.
The diameter of the circle is 8 cm and $A\hat{B}D = 28°$.

(i) Find $C\hat{O}D$.

$C\hat{O}D =$ ..... [2]

8



NOT TO SCALE

In the diagram, the points A, B, C, and D lie on the circle, centre O.

$A\hat{C}B = 69°$ and $D\hat{C}A = 34°$.

(a) Find $A\hat{B}D$.

$A\hat{B}D =$ ..... [1]

Mega Lecture

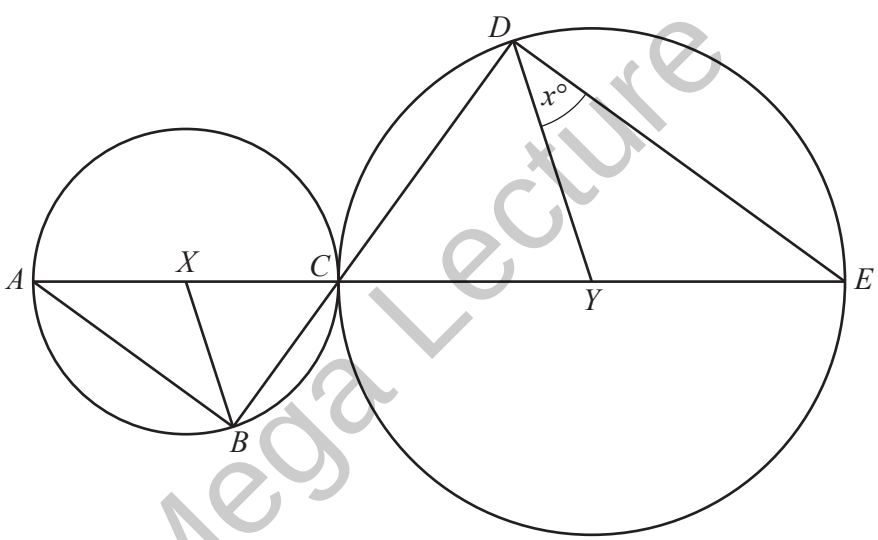
(b) Find $A\hat{O}D$.

$A\hat{O}D =$ ..... [1]

(c) Find $D\hat{A}B$.

$D\hat{A}B =$ ..... [1]

9



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The diagram shows two circles that touch at C.
A, B and C are points on the small circle, centre X.
C, D and E are points on the large circle, centre Y.
$AXCYE$ and BCD are straight lines and $Y\hat{D}E = x°$.

(a) Prove that triangle BCX is similar to triangle DCY.
Give a reason for each statement you make.

[3]

(b) Find, in terms of x,

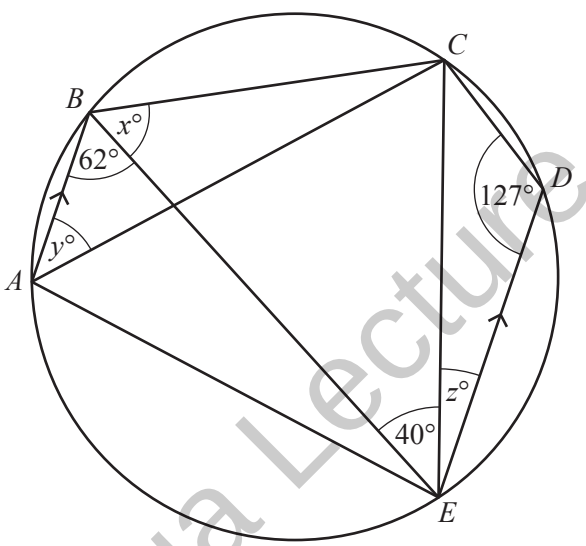
(i) $D\hat{C}Y$,

Answer $D\hat{C}Y =$ ..... [1]

(ii) $B\hat{X}A$.

Answer $B\hat{X}A =$ ..... [1]

10



In the diagram, A, B, C, D and E lie on the circle.
AB is parallel to ED.
$A\hat{B}E = 62°$, $C\hat{D}E = 127°$ and $B\hat{E}C = 40°$.

(a) Find x.

Answer $x =$ ..... [1]

(b) Find y.

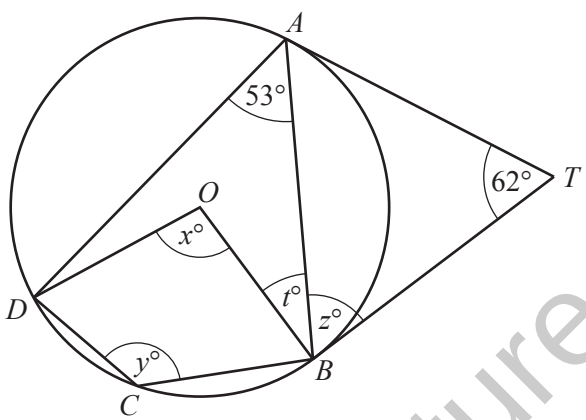
Answer $y =$ ..... [1]

Mega Lecture

(c) Find z.

Answer $z =$ ..... [1]

11



The diagram shows a circle, centre O, that passes through A, B, C and D.
The tangents at A and B meet at T.
$A\hat{T}B = 62°$ and $D\hat{A}B = 53°$.

(a) Find x.

Answer $x =$ ..... [1]

(b) Find y.

Answer $y =$ ..... [1]

(c) Find z.

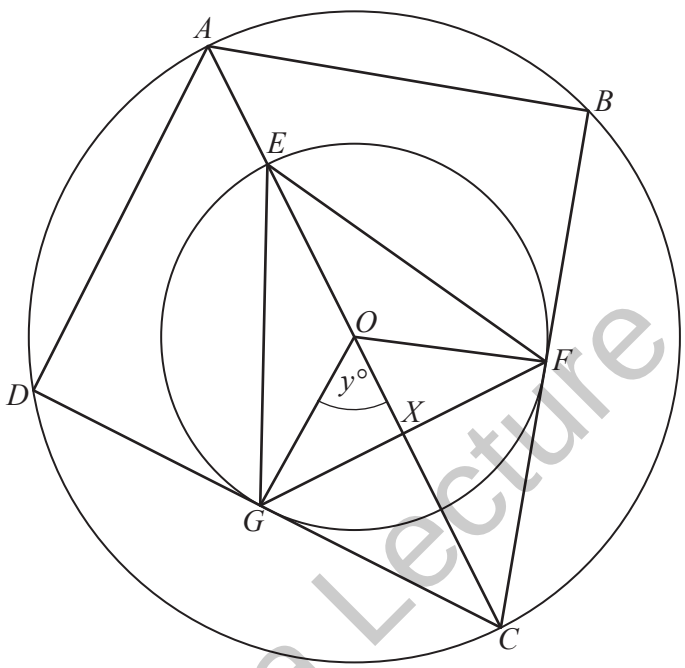
Answer $z =$ ..... [1]

Mega Lecture

(d) Find t.

Answer $t =$ ..... [1]

12



The diagram shows two circles each with centre O.
A, B, C and D are points on the circumference of the large circle.
E, F and G are points on the circumference of the small circle.
CGD and CFB are tangents to the small circle.
Lines $AEOC$ and FG intersect at 90° at X.
$G\hat{O}X = y°$.

(a) Find each of these angles, as simply as possible, in terms of y.
Give reasons for your answers.

(i) $G\hat{E}O$

Answer $G\hat{E}O =$ ..... because .....

..... [2]

(ii) $G\hat{C}X$

Answer $G\hat{C}X =$ ..... because .....

..... [2]

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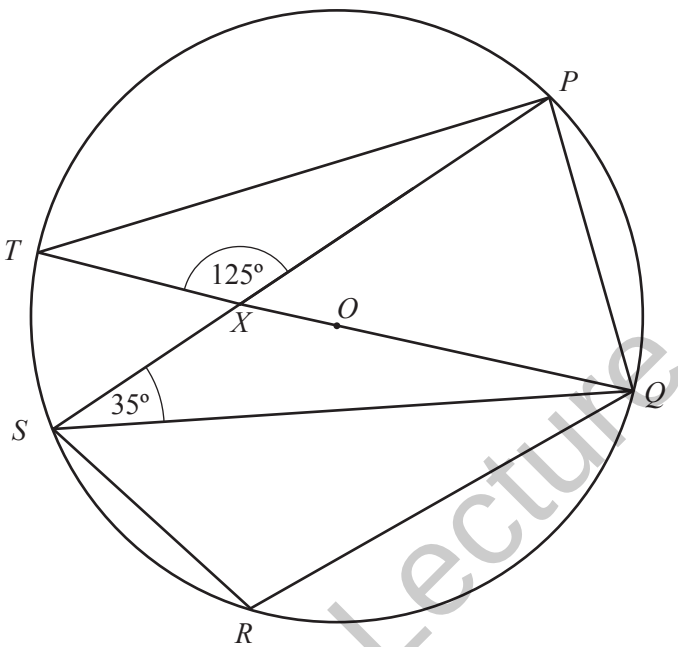
(iii) $D\hat{A}B$

Answer $D\hat{A}B =$ ..... because .....

..... [2]

13



In the diagram, P, Q, R, S and T lie on the circle.
QT is a diameter of the circle, centre O.
X is the point of intersection of PS and QT.
$P\hat{X}T = 125°$ and $P\hat{S}Q = 35°$.

(a) Complete the following statement with a geometrical reason.

$P\hat{T}Q = 35°$ because ..... [1]

(b) Find $P\hat{Q}T$.

Answer $P\hat{Q}T =$ ..... [1]

(c) Find $S\hat{P}Q$.

Answer $S\hat{P}Q =$ ..... [1]

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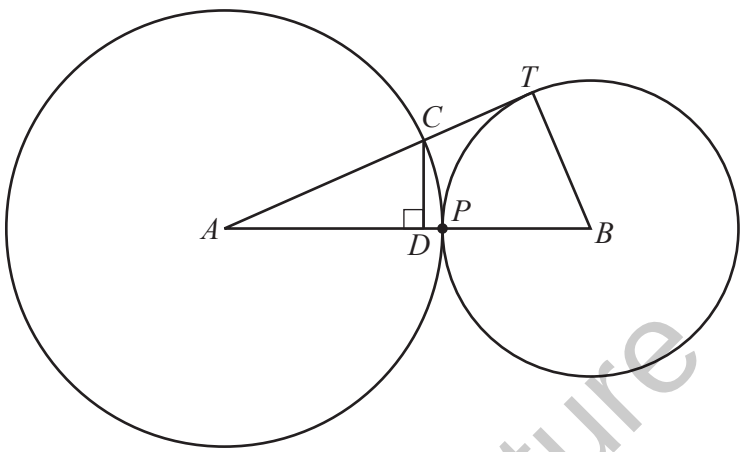
(d) Find $S\hat{R}Q$.

Answer $S\hat{R}Q$ = ... [1]

14



In the diagram, A and B are the centres of two circles that touch at P.
The line ACT touches the small circle at T and intersects the large circle at C.
D is the point on AB such that $C\hat{D}A = 90°$.

(a) Complete the following, to show that triangle ACD is similar to triangle ABT.

In triangle ACD and triangle ABT

angle DAC	=	angle	(same angle)
angle CDA	=	angle	(.....)
angle ACD	=	angle	(two angles in a triangle are equal, so the third angles are equal)

Because the three pairs of angles are equal, the triangles are similar. [2]

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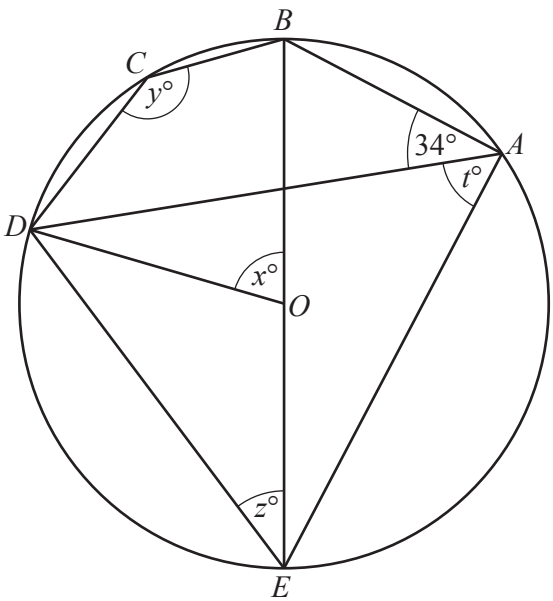
15



In the diagram, A, B, C, D and E lie on the circle, centre O.
BOE is a straight line.
$D\hat{A}B = 34°$.

(a) Find x.

Answer $x =$ ..... [1]

(b) Find y.

Answer $y =$ ..... [1]

(c) Find z.

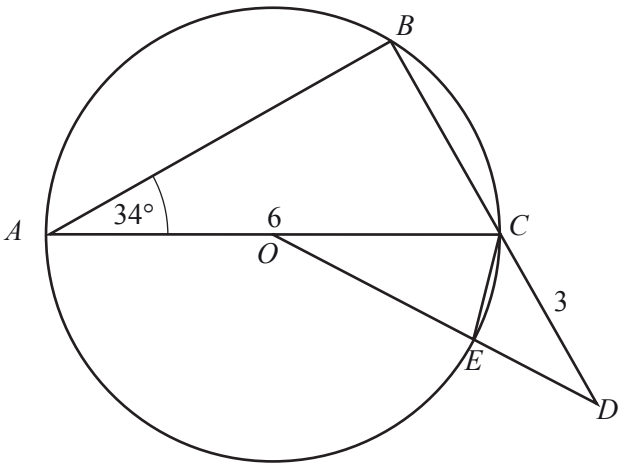
Answer $z =$ ..... [1]

(d) Find t.

Answer $t =$ ..... [1]

Mega Lecture

16 (a)



AC is a diameter of the circle, centre O.
BCD and OED are straight lines.
$AC = 6$ cm and $CD = 3$ cm.
$B\hat{A}C = 34°$.

(i) Explain why $B\hat{C}A = 56°$.

[1]

(ii) Find $C\hat{O}D$.

Answer ..... [2]

(iii) Find $O\hat{C}E$.

Answer ..... [1]

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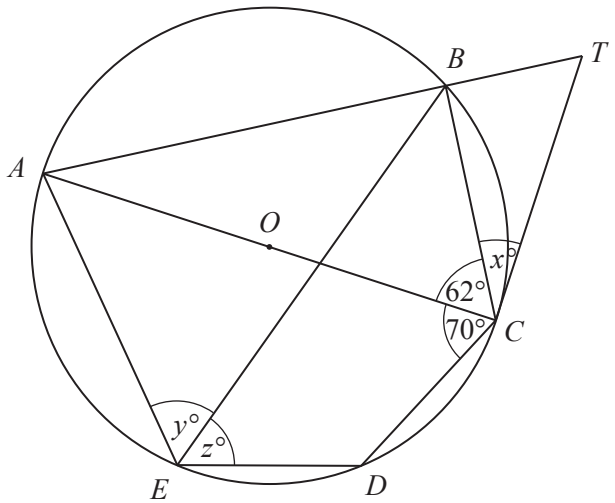
17



In the diagram, A, B, C, D and E lie on the circle, centre O.
AC is a diameter.
The tangent to the circle at C meets the line AB produced at T.

$A\hat{C}B = 62°$ and $A\hat{C}D = 70°$.

(a) Find x.

Answer x = ... [1]

(b) Find y.

Answer y = ... [1]

(c) Find z.

Answer z = ... [1]

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