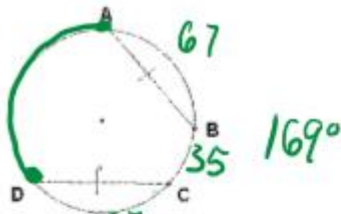


Today we reviewed the homework assignment, then took notes and completed practice on Tangents and Pythagorean theorem. Below is the key to the homework from last night followed by the notes, practice and tonight's homework.

Properties of Chords

Use the following image for problems 1 and 2.



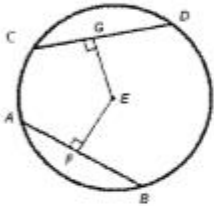
1. If $m\widehat{AB} = 100^\circ$, what is $m\widehat{DC}$?

100

2. If $m\widehat{AB} = 67^\circ$ and $m\widehat{BC} = 35^\circ$. What is the $m\widehat{AD}$?

$360 - 169 = 191^\circ$

Use the following image for questions 3 and 4.



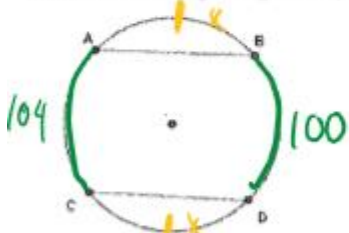
3. If $\widehat{CD} \cong \widehat{AB}$, $m\widehat{EG} = 12$ yd., what is the $m\widehat{EF}$?

12

4. If $\widehat{EG} \cong \widehat{EF}$ and $m\widehat{AB} = 24$ m, what is the $m\widehat{CD}$?

24

Use the following image for questions 5 and 6.



5. If $m\widehat{AB} = 98^\circ$, $m\widehat{AB} = 14$ ft. and $m\widehat{CD} = 98^\circ$, what is the $m\widehat{CD}$?

14 ft

6. If $m\widehat{AB} \cong m\widehat{CD}$, $m\widehat{AC} = 104^\circ$, and $m\widehat{BD} = 100^\circ$ what is the $m\widehat{AB}$?

$104 + 100 + x + x = 360$

$2x + 204 = 360$

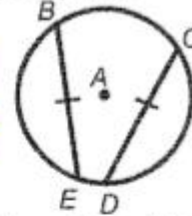
$x = 78^\circ$

4

Name _____ Date _____

7. How could you determine that $\widehat{BE} \cong \widehat{CD}$ in the following image?

They both are formed by congruent chords



Use the following image for the problems 8, 9 and 10.



8. If $m\widehat{DB} = 92^\circ$, what is $m\widehat{DC}$?

$92 \times 2 = 184$

$m\widehat{DC} = 184$



9. If the $m\widehat{OE} = 10$ cm and $m\widehat{OA} = 15$ cm, what is the $m\widehat{BE}$?

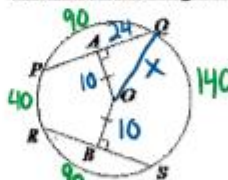
$15 - 10 = 5$

$m\widehat{BE} = 5$

10. If $m\widehat{AB} = 10$ in., $m\widehat{EB} = 2$ in., what is the $m\widehat{DE}$?

$DE = 4$

Use the following image for problems 11, 12 and 13.



11. If $m\widehat{PQ} = 15$ in., what is the $m\widehat{RB}$?

$\frac{15}{2} = 7.5$ in

12. If $m\widehat{PQ} = 90^\circ$, $m\widehat{QS} = 140^\circ$, what is the $m\widehat{RP}$?

$90 + 90 + 140 + \widehat{RP} = 360$

$320 + \widehat{RP} = 360$

$\widehat{RP} = 40^\circ$

13. If $m\widehat{OB} = 10$ cm and $m\widehat{AQ} = 24$ cm, what is $m\widehat{OQ}$? (note: \widehat{OQ} is not drawn, but you may draw it in.)

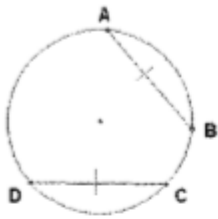
$10^2 + 24^2 = c^2$

$100 + 576 = c^2$

$676 = c^2$

$26 = c$

Use the following image for problems 14 and 15.



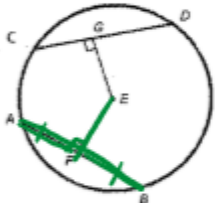
14. If $m\widehat{AB} = 2x + 27$ and $m\widehat{DC} = 4x - 39$ What is the value of x ?

$$\begin{aligned} 2x + 27 &= 4x - 39 \\ 66 &= 2x \\ 33 &= x \end{aligned}$$

15. If $m\widehat{AB} = 67^\circ$ and $m\widehat{AD} = 135^\circ$. What is the $m\widehat{BC}$?

$$\begin{aligned} 67 + 135 + 67 + m\widehat{BC} &= 360 \\ 269 + m\widehat{BC} &= 360 \\ m\widehat{BC} &= 91^\circ \end{aligned}$$

Use the following image for questions 16-18.



16. If $\overline{CD} \cong \overline{AB}$, $m\widehat{EG} = x + 9$, and $m\widehat{EF} = 9x - 7$ What is the value of x ?

$$\begin{aligned} 9x - 7 &= x + 9 \\ 8x &= 16 \\ x &= 2 \end{aligned}$$

17. If $m\widehat{AF} = 10x + 2$ and $m\widehat{BF} = 8x + 8$, what is the $m\widehat{AB}$?

$$\begin{aligned} 10x + 2 &= 8x + 8 \\ 2x &= 6 \\ x &= 3 \\ m\widehat{AB} &= 10(3) + 2 + 8(3) + 8 \\ m\widehat{AB} &= 64 \end{aligned}$$

18. If $\overline{EG} \cong \overline{EF}$ and $m\widehat{CD} = 4x + 15$ and

$m\widehat{AB} = 6x - 21$, what is the value of x ?

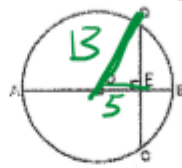
$$\begin{aligned} 6x - 21 &= 4x + 15 \\ 2x &= 36 \\ x &= 18 \end{aligned}$$

19. How could you determine that $\overline{BE} \cong \overline{CD}$ in the following image?

$\angle BAE \cong \angle CAD$ so $\overline{BE} \cong \overline{CD}$. Because the arcs are congruent the chords that form them are congruent.



Use the following image for the problems 20-22.



20. If $m\widehat{DB} = 14x - 12$ and $m\widehat{CB} = 2x + 36$, what is $m\widehat{DC}$?

$$\begin{aligned} 14x - 12 &= 2x + 36 \\ 12x &= 48 \\ x &= 4 \\ m\widehat{DC} &= 14(4) - 12 + 2(4) + 36 \\ m\widehat{DC} &= 88 \end{aligned}$$

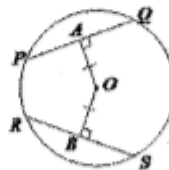
21. If the radius of the circle is 15 m and $m\widehat{DE} = 12m$, what is the $m\widehat{OE}$?

$$\begin{aligned} 15^2 &= x^2 + 12^2 \\ x^2 + 144 &= 225 \\ x^2 &= 81 \rightarrow m\widehat{OE} = 9 \end{aligned}$$

22. If $m\widehat{OE} = 5$ and $m\widehat{OA} = 13$, what is the $m\widehat{DC}$?

$$\begin{aligned} 5^2 + x^2 &= 13^2 \\ x &= 12 \\ m\widehat{DC} &= 24 \end{aligned}$$

Use the following image for problems 23 and 24.



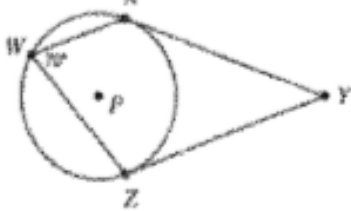
23. If $m\widehat{PQ} = 5x + 2$ and $m\widehat{RS} = 3x + 12$ what is the $m\widehat{RB}$?

$$\begin{aligned} 5x + 2 &= 3x + 12 \\ 2x &= 10 \\ x &= 5 \\ m\widehat{RS} &= 3(5) + 12 \\ m\widehat{RS} &= 27 \\ m\widehat{RB} &= 13.5 \end{aligned}$$

24. If $m\widehat{PQ} = 87^\circ$, $m\widehat{RP} = 43^\circ$ and $m\widehat{QS} = 7x + 3$ What is the value of x ?

$$\begin{aligned} 87 + 43 + 87 + 7x + 3 &= 360 \\ 220 + 7x &= 360 \\ 7x &= 140 \\ x &= 20 \end{aligned}$$

Circle with center P has tangents \overline{XY} and \overline{ZY} and chords \overline{WZ} , as shown in the figure. The $m\angle ZWX = 70^\circ$. What is the $m\angle XYZ$?
 A. 20° B. 35° C. 40° D. 55°



1



Point of Tangency

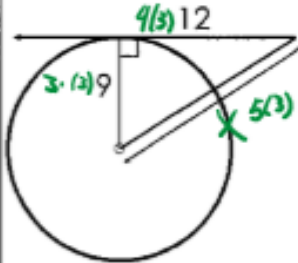
If a line (segment or ray) is tangent to a circle, then it is perpendicular to the radius at the point of tangency.

What formula can be used with a right triangle?

Pythagorean Theorem

2

1. Find the value of x.



$$9^2 + 12^2 = x^2$$

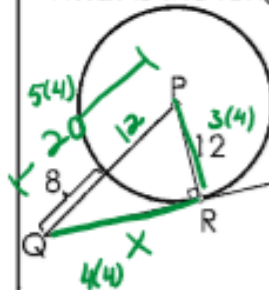
$$81 + 144 = x^2$$

$$225 = x^2$$

$$15 = x$$

3

What is the length of \overline{RQ} ?



$$a^2 + b^2 = c^2$$

$$12^2 + x^2 = 20^2$$

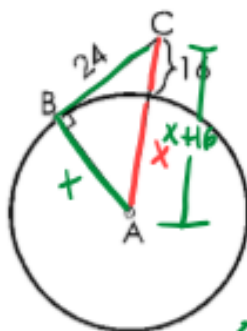
$$144 + x^2 = 400$$

$$x^2 = 256$$

$$x = 16$$

4

What is the radius of $\odot A$?



$$24^2 + x^2 = (x+16)^2$$

$$576 + x^2 = x^2 + 16x + 16x + 256$$

$$576 + x^2 = x^2 + 32x + 256$$

$$576 = 32x + 256$$

$$320 = 32x$$

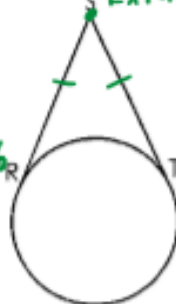
$$10 = x$$

5

Exterior

$\overline{RS} \cong \overline{TS}$

If two segments from the same exterior point are tangent to a circle, then they are congruent.



6

4. Find the value of x .

$x+5 = 3x+1$
 $4 = 2x$
 $2 = x$

7

Find the value of x .

$x^2 - 15 = 14x$
 $x^2 - 14x - 15 = 0$
 $(x+1)(x-15) = 0$
 $x+1 = 0$ $x-15 = 0$
 $x = -1$ $x = 15$

8

Find the value of x .

9

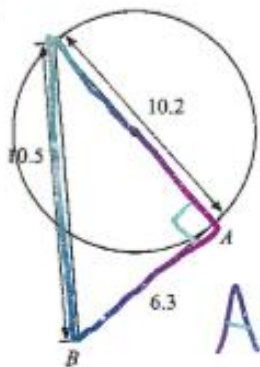
What is the length of \overline{NP} ?

$NP = 14$

10

Determine if line AB is tangent to the circle. → + sine pyth. rule

1)

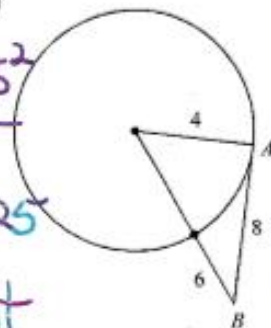


$$6.3^2 + 10.2^2 = 10.5^2$$

$$143.73 \neq 110.25$$

AB is not tangent

2)

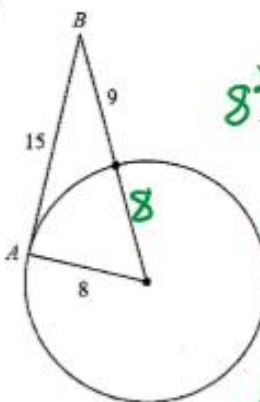


$$4^2 + 8^2 = 10^2$$

$$80 \neq 100$$

AB is not tangent

3)



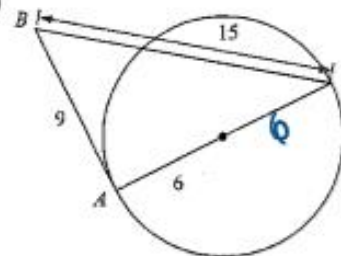
$$8^2 + 15^2 = 17^2$$

$$64 + 225 = 289$$

$$289 = 289 \checkmark$$

AB is tangent

4)



$$9^2 + 12^2 = 15^2$$

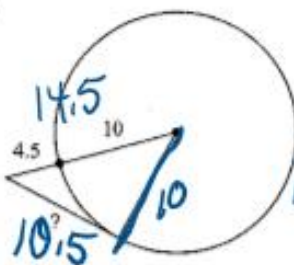
$$81 + 144 = 225$$

$$225 = 225$$

AB is tangent

Find the segment length indicated. Assume that lines which appear to be tangent are tangent.

5)



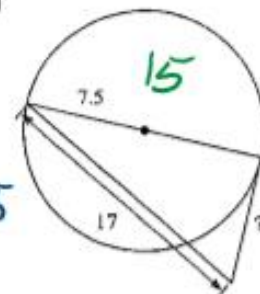
$$10^2 + x^2 = 14.5^2$$

$$100 + x^2 = 210.25$$

$$x^2 = 110.25$$

$$x = 10.5$$

6)



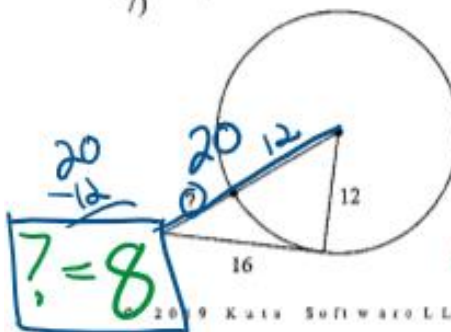
$$15^2 + x^2 = 17^2$$

$$225 + x^2 = 289$$

$$x^2 = 64$$

$$x = 8$$

7)



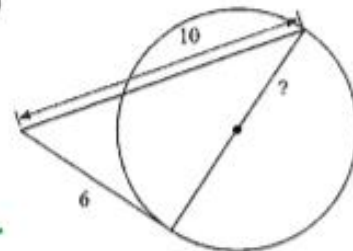
$$12^2 + 16^2 = x^2$$

$$144 + 256 = x^2$$

$$400 = x^2$$

$$20 = x$$

8)



$$6^2 + x^2 = 10^2$$

$$36 + x^2 = 100$$

$$x^2 = 64$$

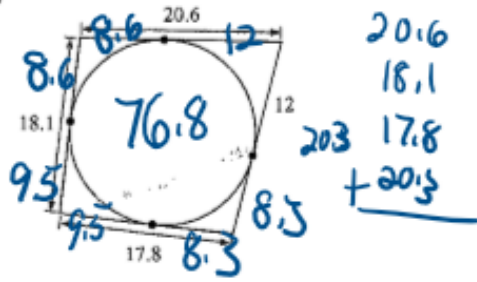
$$x = 8$$

$$x = 8$$

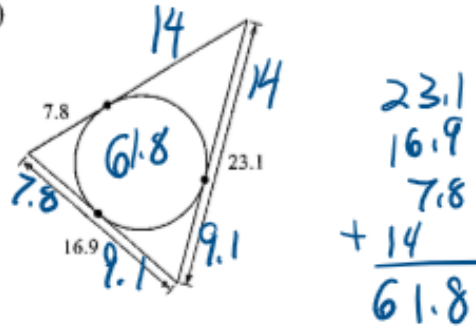
$$x = 4$$

Find the perimeter of each polygon. Assume that lines which appear to be tangent are tangent.

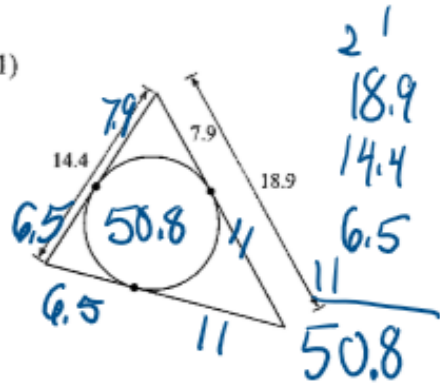
9)



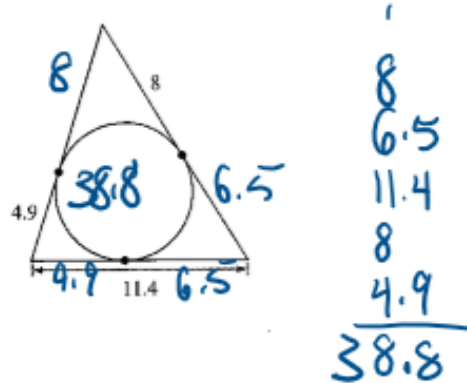
10)



11)

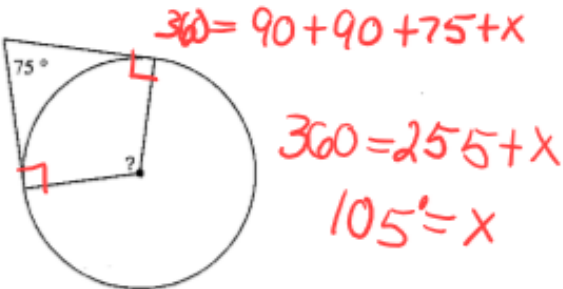


12)

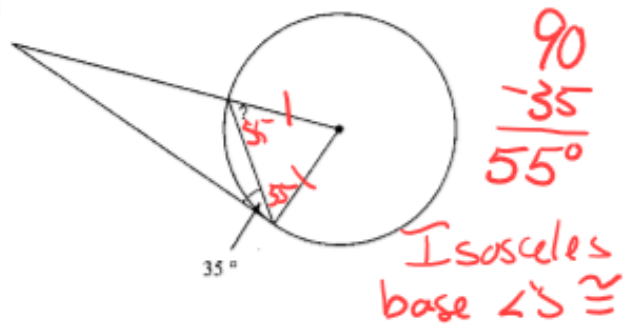


Challenge Problems: Find the angle measure indicated. Assume that lines which appear to be tangent are tangent.

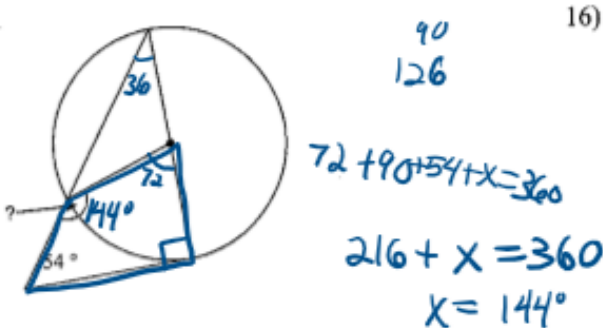
13)



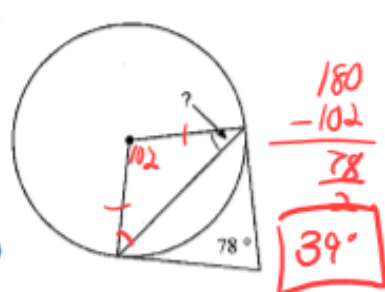
14)



15)

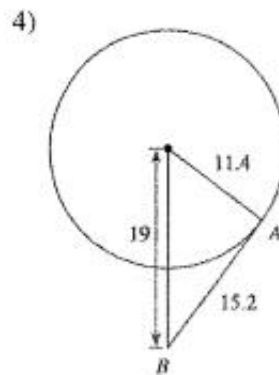
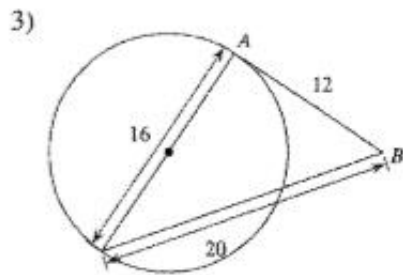
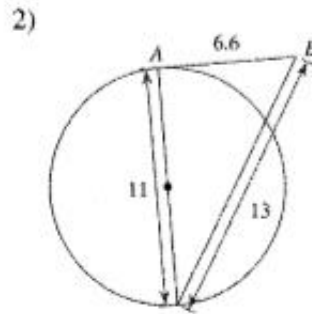
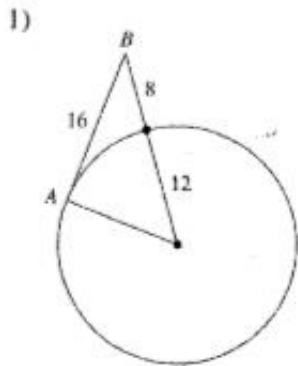


16)

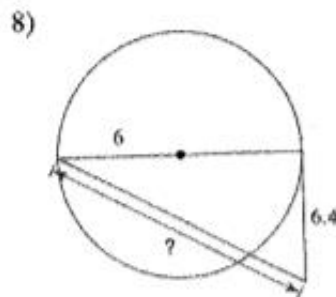
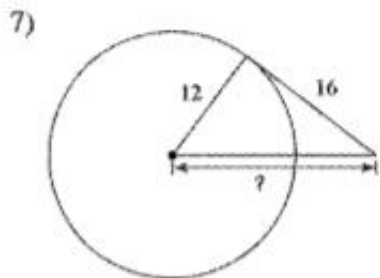
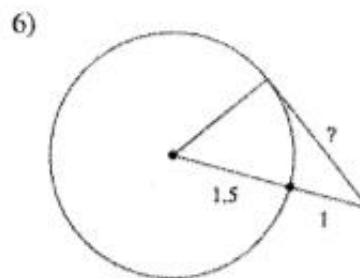
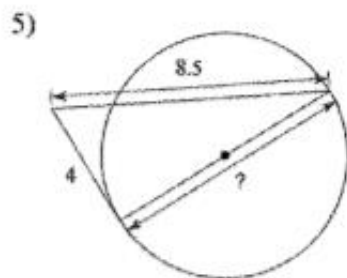


Tangents to Circles

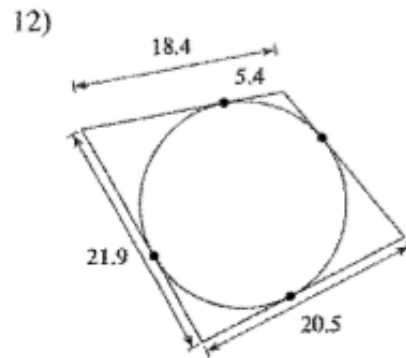
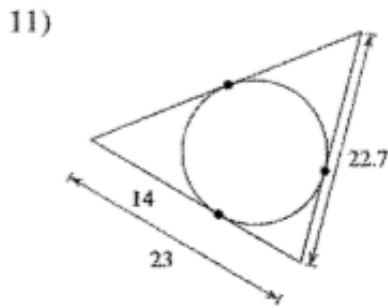
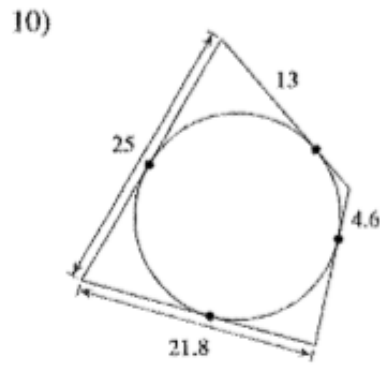
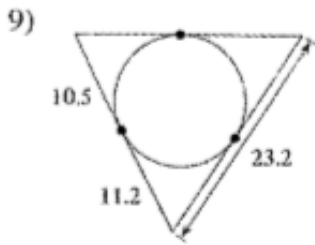
Determine if line AB is tangent to the circle.



Find the segment length indicated. Assume that lines which appear to be tangent are tangent.

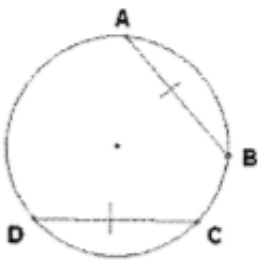


Find the perimeter of each polygon. Assume that lines which appear to be tangent are tangent.

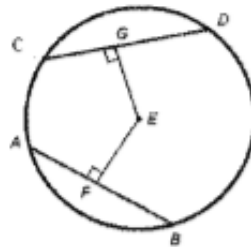


Properties of Chords Recap: Find the value indicated for each.

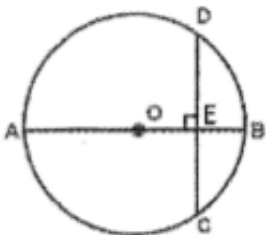
13) If $m\widehat{AB} = 84^\circ$ and $m\widehat{BC} = 45^\circ$,
what is the $m\widehat{AD}$?



14) If $\overline{EG} \cong \overline{EF}$ and $m\widehat{AB} = 24^\circ$,
what is the $m\widehat{CG}$?



15) If $m\widehat{OB} = 15^\circ$ and $m\widehat{DC} = 24^\circ$,
what is the $m\widehat{OE}$?



16) How could it be determined that $\overline{EB} \cong \overline{DC}$ in
the following image?

