SECTION 9.6:
OTHER ANGLES

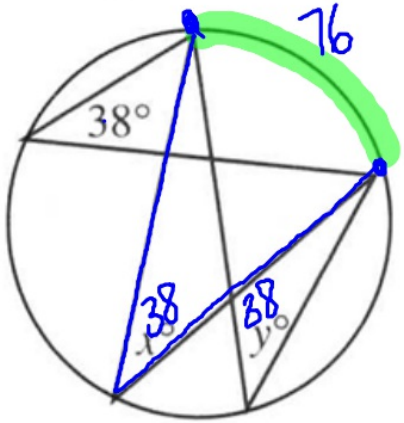
Standards:

7.0 - Students prove and use theorems involving the properties of parallel lines cut by a transversal, the properties of quadrilaterals, and the properties of circles.

WARMUP #6

Tangents and chords are shown. Find the values of x and y. In Exercise 5, O is the center of the circle.

4.



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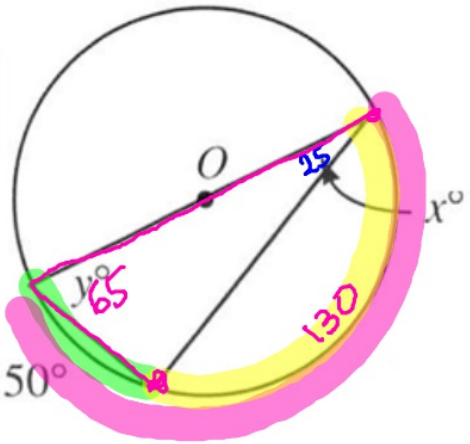

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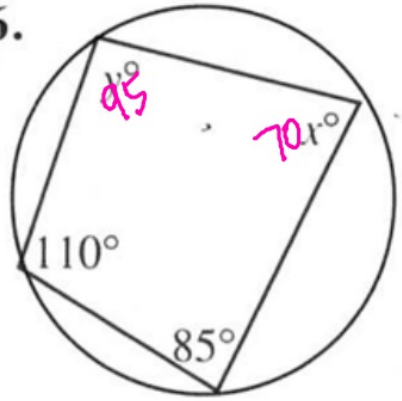

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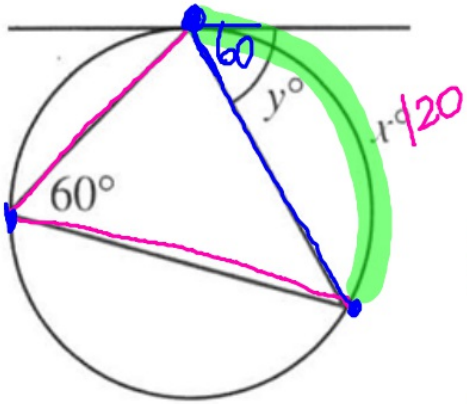

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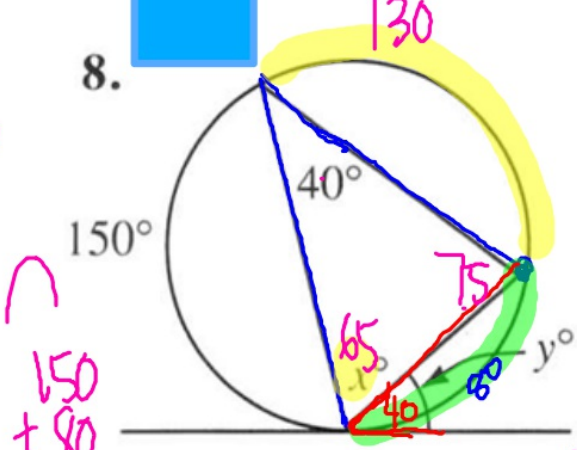
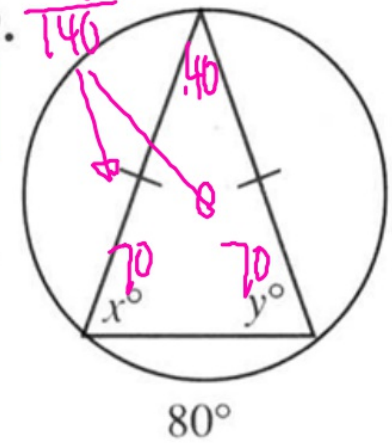


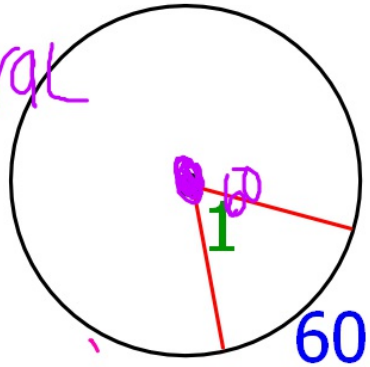
150 + 80 = 230; 360 − 230

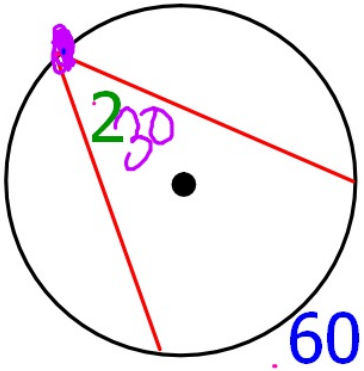
40 + 75 = 115; 180 − 115

9.



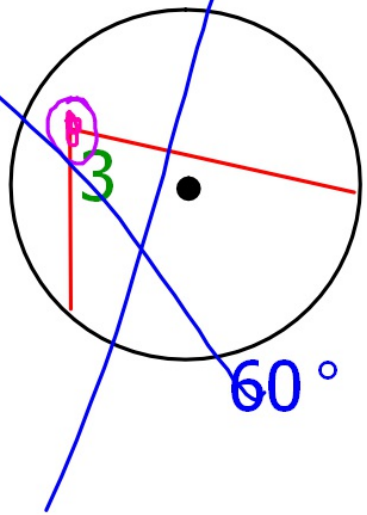
central ∠

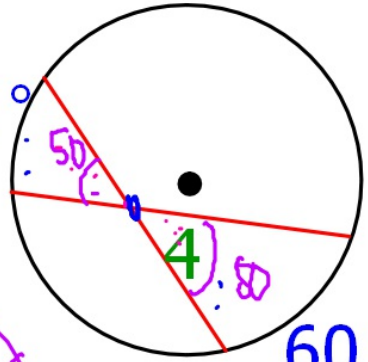




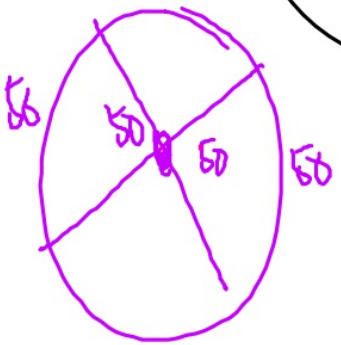
inscribed ∠ (Half)

???

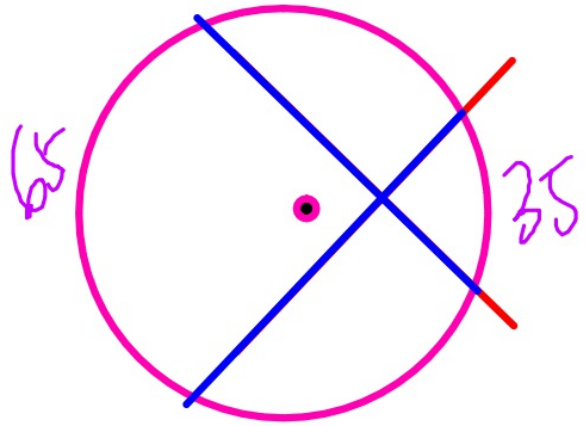


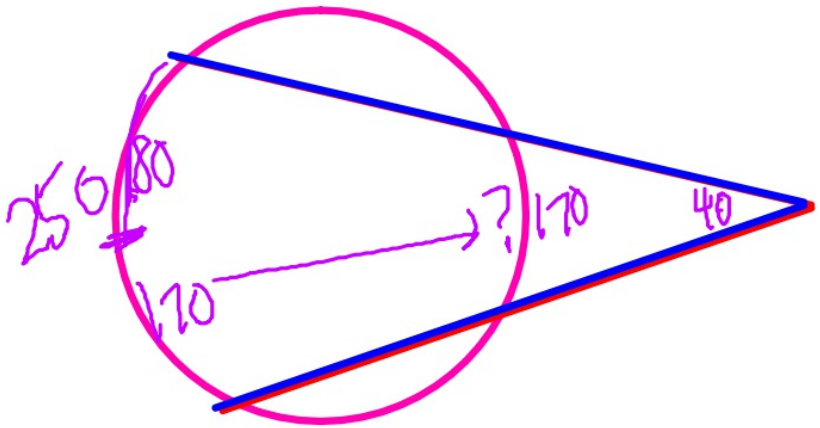


100



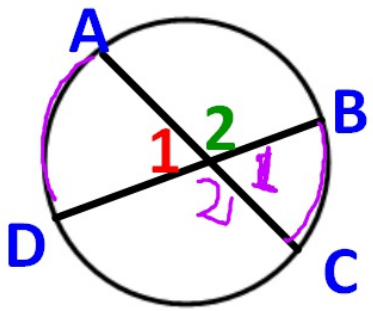
Average


65
35


250
80
?
170
40
170

THEOREM

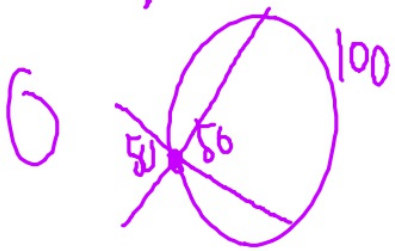
The measure of an angle formed by 2 chords that intersect inside a circle = 1/2 the sum of the measures of the intercepted arcs.



$$m\angle 1 = \frac{1}{2}\left(m\left(\overset{\frown}{AD}\right) + m\left(\overset{\frown}{BC}\right)\right)$$

(Average)

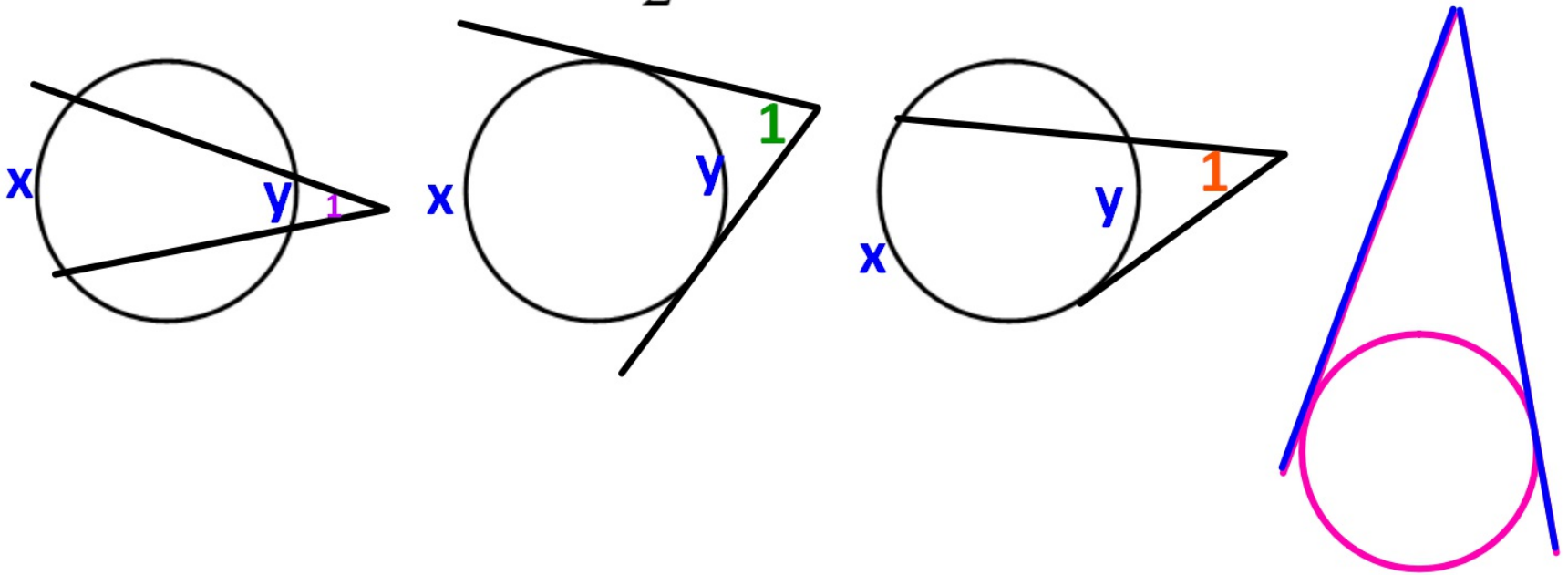
$$m\angle 2 = \frac{1}{2}\left(m\left(\overset{\frown}{AB}\right) + m\left(\overset{\frown}{DC}\right)\right)$$



THEOREM

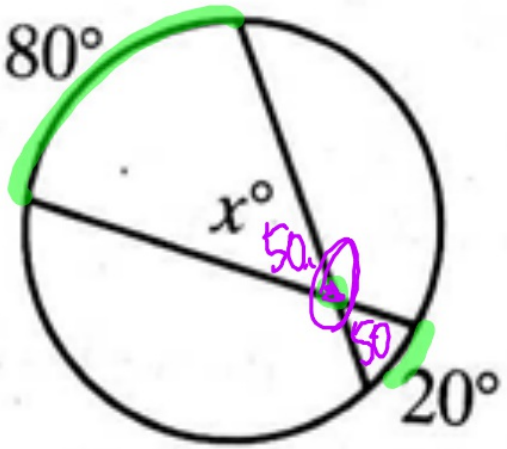
The measure of an angle formed by two secants, two tangents or a secant and a tangent drawn from a point outside a circle = 1/2 the difference of the measures of the intercepted arcs.

$$m\angle 1 = \frac{1}{2}(x - y)$$



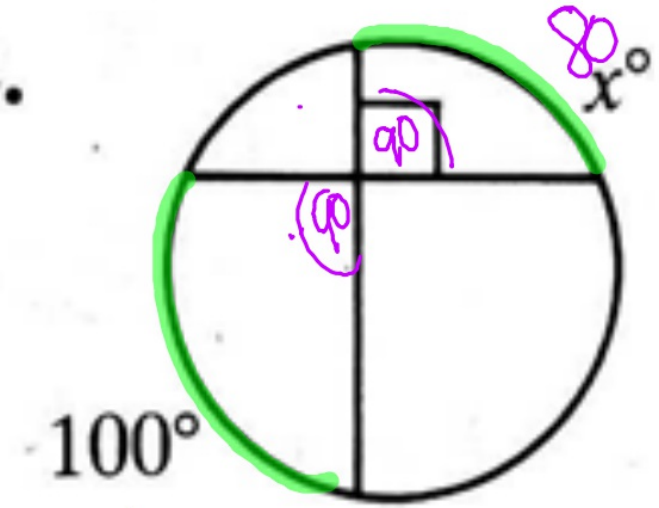
Find the value of x.

1.



80+20

2.



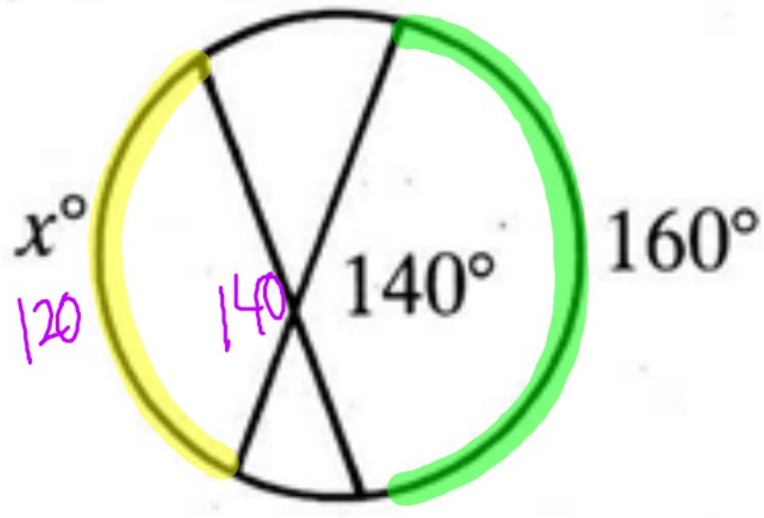
$100 + x = 2(90)$

$100 + x = 180$

$-100 \quad -100$

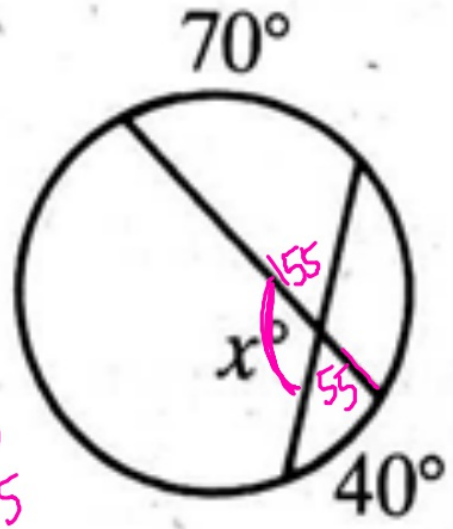
$x = 80$

3.



120

4.

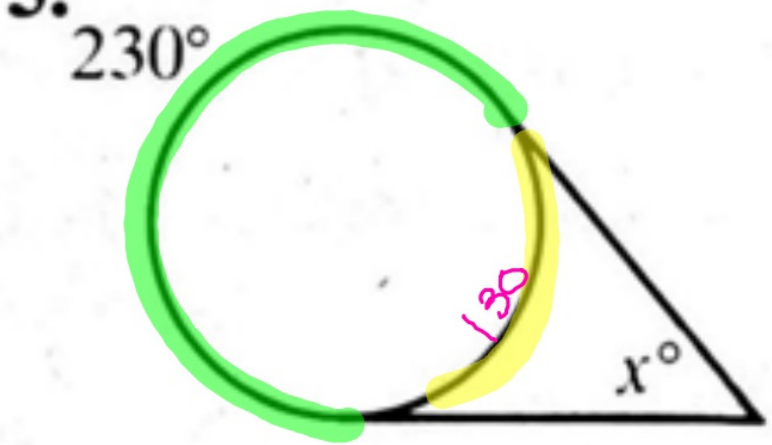


180
−55

✦ **125**

Find the value of x.

5.

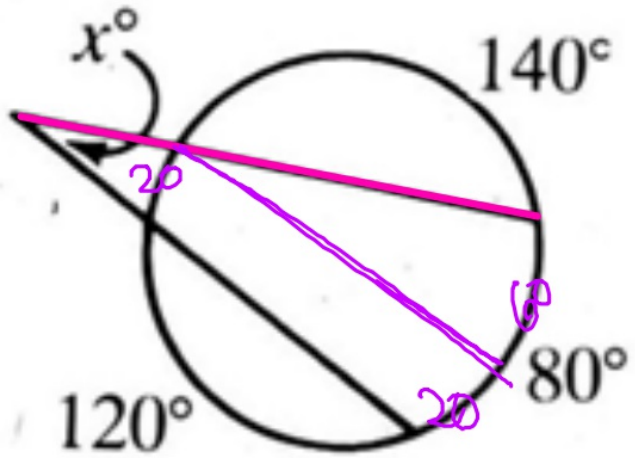


230
−130
100

50

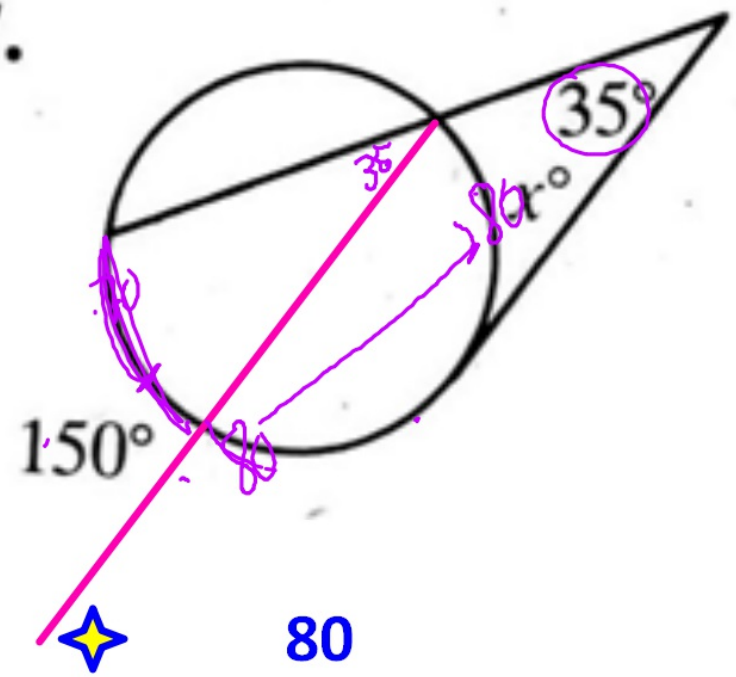
✦ 50

6.



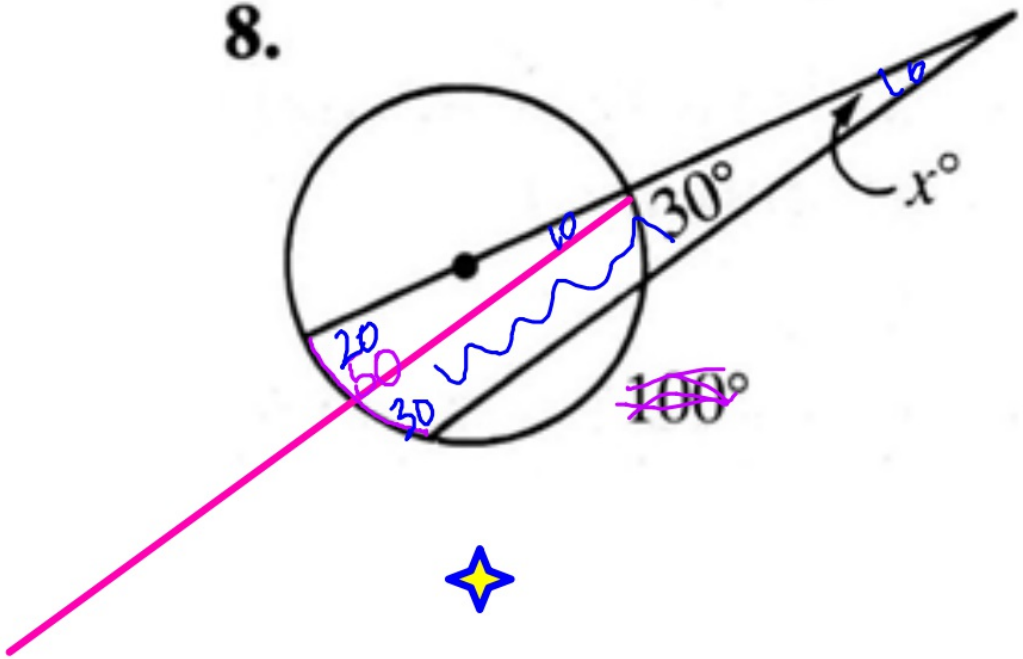
✦ 30

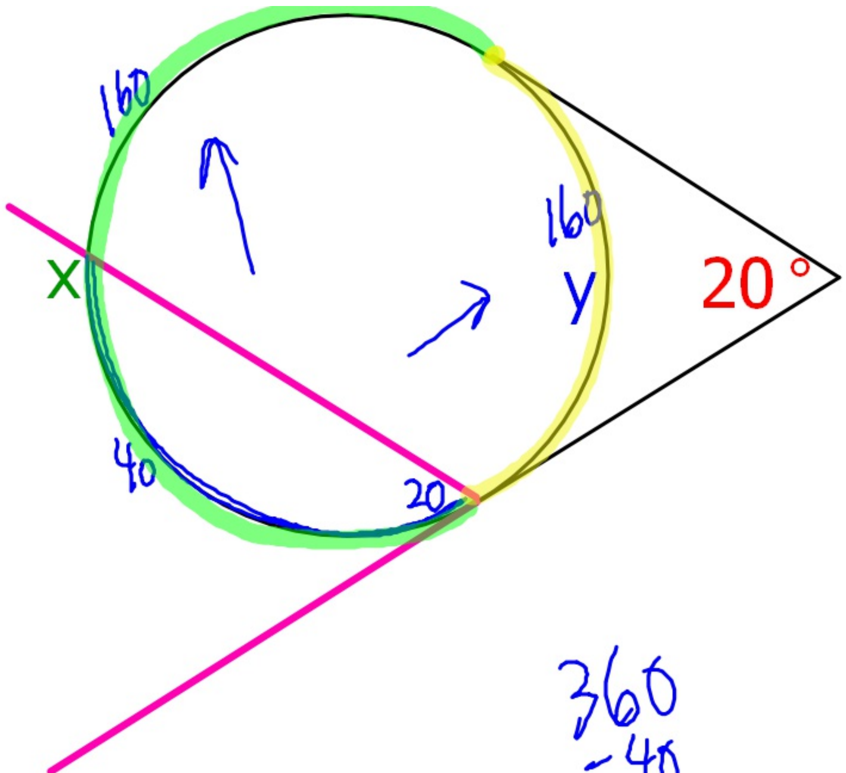
7.



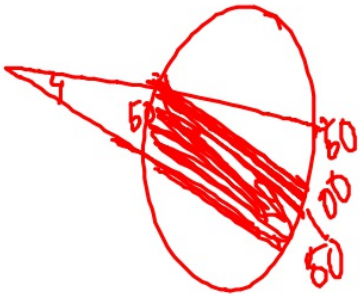
80

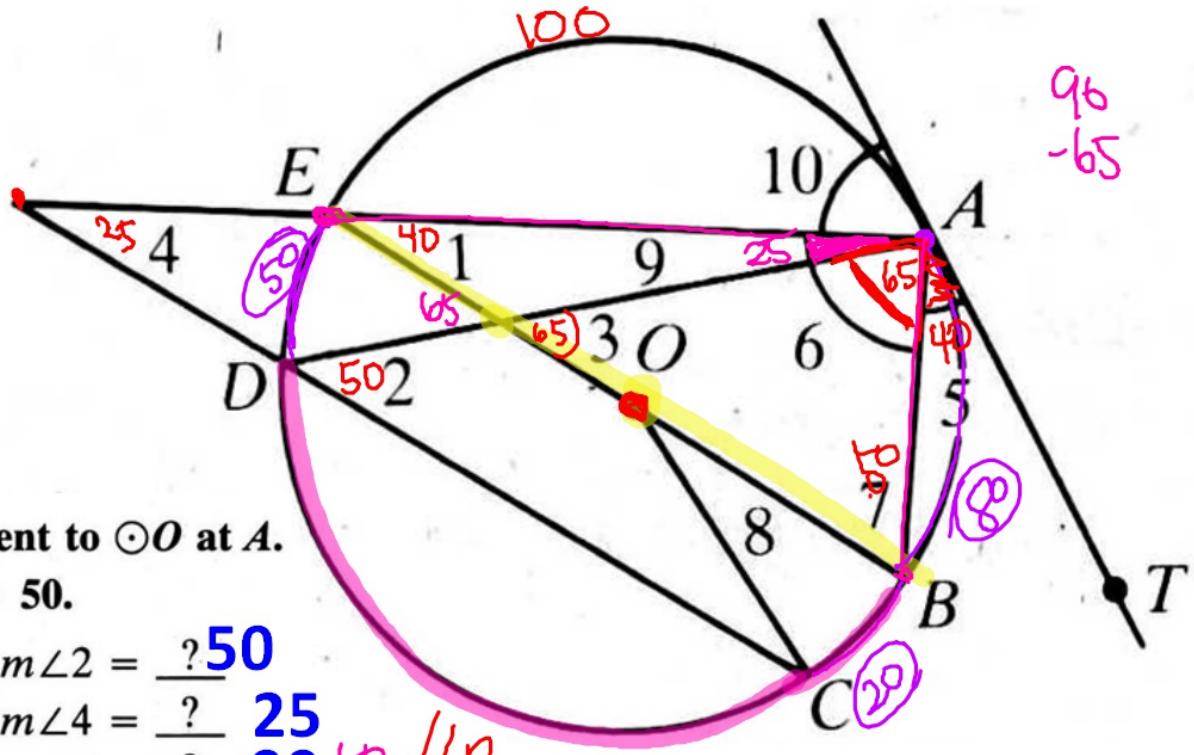
8.





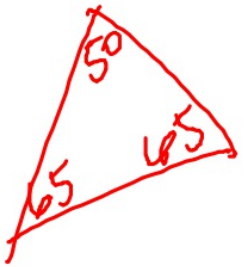
$$\begin{array}{r} 360 \\ -40 \\ \hline 320 \end{array}$$





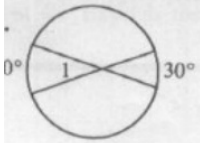
$\overline{BE}$ is a diameter of $\odot O$. $\overleftrightarrow{AT}$ is tangent to $\odot O$ at A. $m\overset{\frown}{AB} = 80$, $m\overset{\frown}{BC} = 20$, and $m\overset{\frown}{DE} = 50$.

9. $m\angle 1 =$? 40
10. $m\angle 2 =$? 50
11. $m\angle 3 =$? 65
12. $m\angle 4 =$? 25
13. $m\angle 5 =$? 40
14. $m\angle 6 =$? ~~90~~ 65
15. $m\angle 7 =$? 50
16. $m\angle 8 =$? 20
17. $m\angle 9 =$? 25
18. $m\angle 10 =$? 50

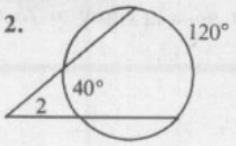


lassroom Exercises

d the measure of each numbered angle.



2.



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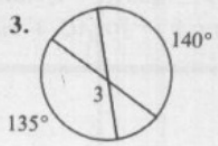

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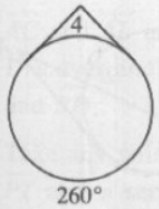

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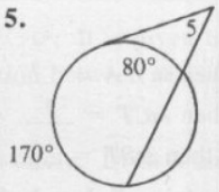

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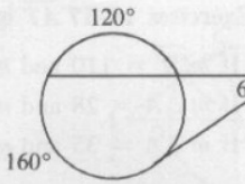
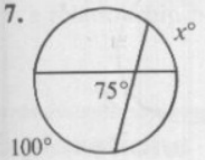


State an equation you could use to find the value of x. Then solve for x.

7.



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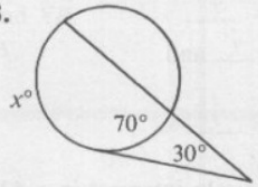

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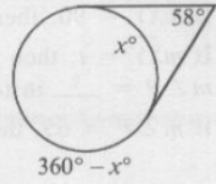
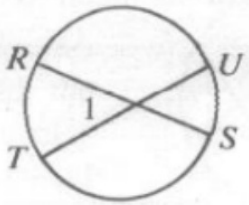


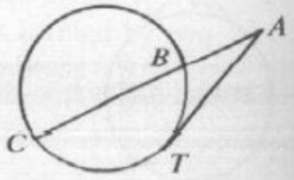
Complete.

11. If $m\overset{\frown}{RT} = 80$ and $m\overset{\frown}{US} = 40$, then $m\angle 1 =$ ___?___.
12. If $m\overset{\frown}{RU} = 130$ and $m\overset{\frown}{TS} = 100$, then $m\angle 1 =$ ___?___.
13. If $m\angle 1 = 50$ and $m\overset{\frown}{RT} = 70$, then $m\overset{\frown}{US} =$ ___?___.
14. If $m\angle 1 = 52$ and $m\overset{\frown}{US} = 36$, then $m\overset{\frown}{RT} =$ ___?___.



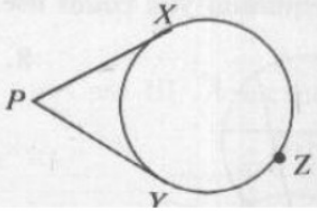
In Exercises 15–17 $\overline{AT}$ is a tangent.

15. If $m\overset{\frown}{CT} = 110$ and $m\overset{\frown}{BT} = 50$, then $m\angle A =$ ___?___.
16. If $m\angle A = 28$ and $m\overset{\frown}{BT} = 46$, then $m\overset{\frown}{CT} =$ ___?___.
17. If $m\angle A = 35$ and $m\overset{\frown}{CT} = 110$, then $m\overset{\frown}{BT} =$ ___?___.



In Exercises 18–21 $\overline{PX}$ and $\overline{PY}$ are tangents.

18. If $m\overset{\frown}{XZY} = 250$, then $m\angle P =$ ___?___.
19. If $m\overset{\frown}{XY} = 90$, then $m\angle P =$ ___?___.
20. If $m\overset{\frown}{XY} = t$, then $m\overset{\frown}{XZY} =$ ___?___ and $m\angle P =$ ___?___ in terms of t.
21. If $m\angle P = 65$, then $m\overset{\frown}{XY} =$ ___?___.



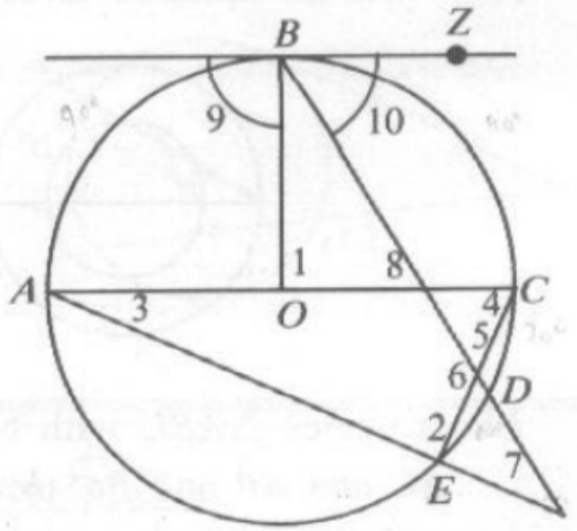
HW 9.6

- Pg. 358 (CE): # 1-9
- Pg. 359 (WE): #1-17

***P359 1-10

Written Exercises

1–10. $\overleftrightarrow{BZ}$ is tangent to $\odot O$; $\overline{AC}$ is a diameter; $m\overset{\frown}{BC} = 90$; $m\overset{\frown}{CD} = 30$; $m\overset{\frown}{DE} = 20$. Draw your own large diagram so that you can write arc measures alongside the arcs. Find the measure of each numbered angle.



***P359 1-10