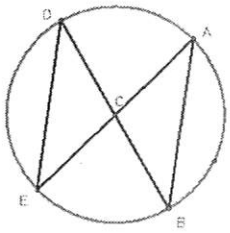
Unit 4 Test Part 1 Study Guide Name Key S: ____

1. **Identifying Inscribed Angles**

a) What is the relationship of $\measuredangle AED$ to $\overset{\frown}{AD}$?

$\angle AED = \frac{1}{2}(\overset{\frown}{AD})$

b) $\measuredangle DEA$ is congruent to what angle?



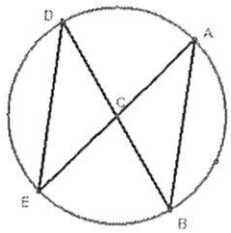
$\angle ABD$

2. **Identifying Central Angles**

a) $\measuredangle ACB$ is congruent to what arc?

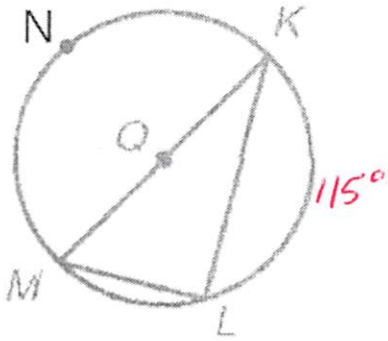
$\overset{\frown}{AB}$

b) $\measuredangle ACD$ is congruent to what arc?



$\overset{\frown}{AD}$

In the circle at right, $\overset{\frown}{KL} = 115°$.



3. What is the measure of $\overset{\frown}{MNK}$?

180°

4. What is the measure of $\measuredangle MLK$?

90°

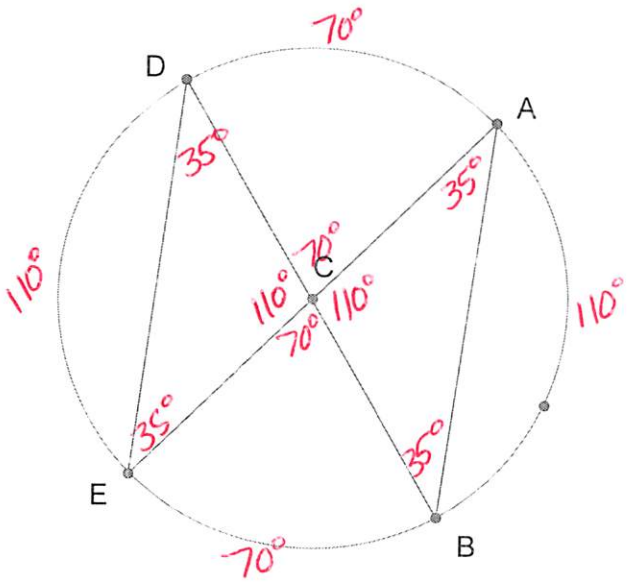
5. What is the measure of $\overset{\frown}{ML}$?

65°

6. What is the measure of $\measuredangle MKL$?

32.5°

In the circle C below, $m\measuredangle CAB = 35°$, and $m\measuredangle ACB = 110°$. Find the following measures.



7. $m\overset{\frown}{AB}$ = 110°

8. $m\overset{\frown}{EB}$ = 70°

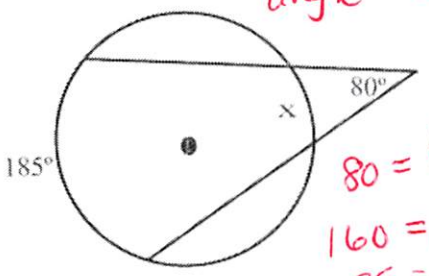
9. $m\angle EDB$ = 35°

10. $m\overset{\frown}{DA}$ = 70°

11. $m\angle ACD$ = 70°

For the following problems, determine which theorem to use, write an equation, and solve.

13.



angle = $\frac{\text{arc} - \text{arc}}{2}$

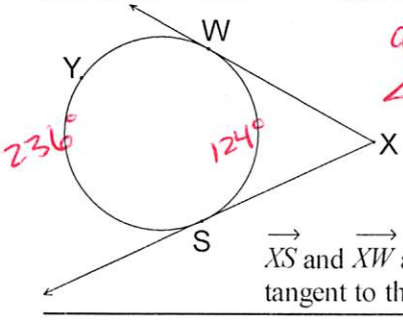
$80 = \frac{185 - x}{2}$

$160 = 185 - x$

$-25 = -x$

$x = 25$

14. $m\overset{\frown}{WS} = 124^0$ find $\angle WXS$



angle = $\frac{\text{arc} - \text{arc}}{2}$

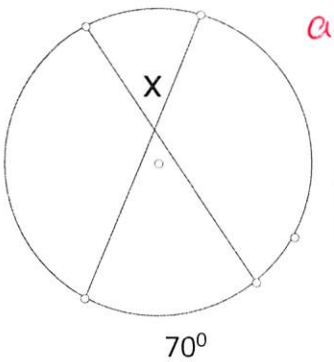
$\angle WXS = \frac{236 - 124}{2}$

$\angle WXS = \frac{112}{2}$

$\angle WXS = 56^\circ$

$\overrightarrow{XS}$ and $\overrightarrow{XW}$ are tangent to the circle

15.

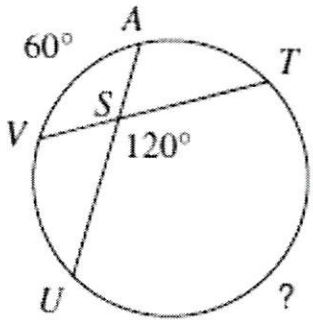


angle = $\frac{\text{arc} + \text{arc}}{2}$

$x = \frac{20 + 70}{2}$

$x = 45^\circ$

16.



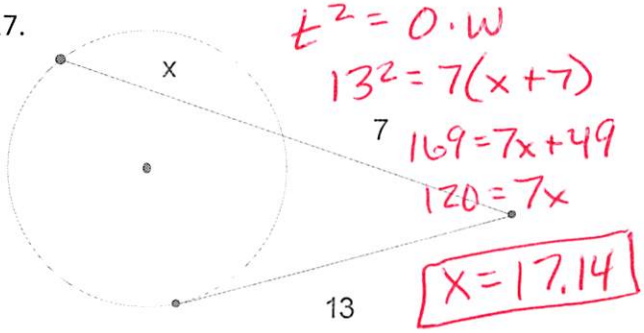
angle = $\frac{\text{arc} + \text{arc}}{2}$

$120 = \frac{60 + x}{2}$

$240 = 60 + x$

$x = 180^\circ$

17.



$t^2 = O \cdot W$

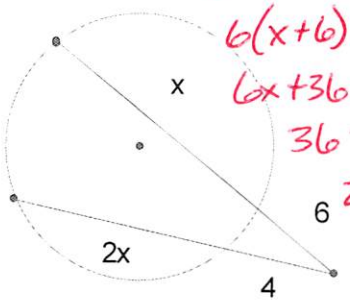
$13^2 = 7(x + 7)$

$169 = 7x + 49$

$120 = 7x$

$x = 17.14$

18.



$O \cdot W = O \cdot W$

$6(x + 6) = 4(2x + 4)$

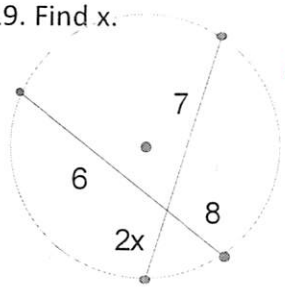
$6x + 36 = 8x + 16$

$36 = 2x + 16$

$20 = 2x$

$x = 10$

19. Find x.



$2x(7) = 8(6)$

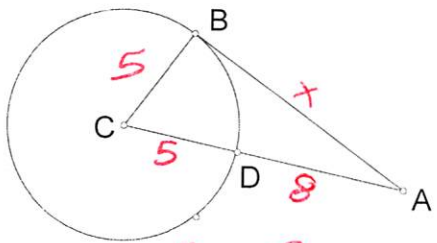
$14x = 48$

$x = 3.43$

or

$x = \frac{24}{7}$

20. $\overline{AD} = 8$ and $\overline{CB} = 5$ find $\overline{AB}$



$x^2 + 5^2 = 13^2$

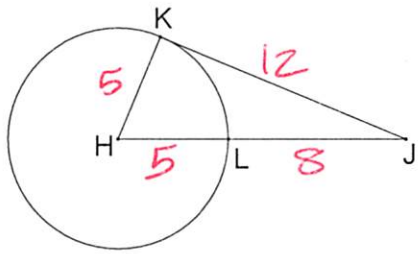
$x^2 + 25 = 169$

$x^2 = 144$

$\overline{AB} = 12$

21. In the circle to the right, $\overline{HK} = 5$, $\overline{KJ} = 12$, and $\overline{LJ} = 8$.

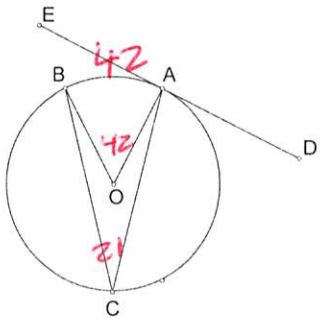
Determine if $\overline{KJ}$ is tangent to the circle.
Show work and explain.



$5^2 + 12^2 = 13^2$
$25 + 144 = 169$
$169 = 169$ ✓
yes it is tangent.

22. In the picture to the right, $m\overset{\frown}{AB} = 42^0$.

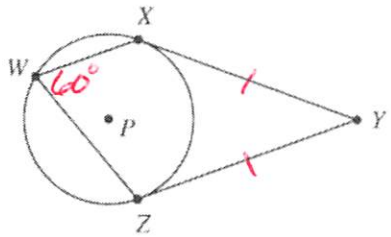
What is the relationship between $\angle AOB$ and $\angle ACB$?



$\angle ACB$ is $\frac{1}{2}$ of $\angle AOB$
$\angle AOB = 42^\circ$ $\angle ACB = 21^\circ$

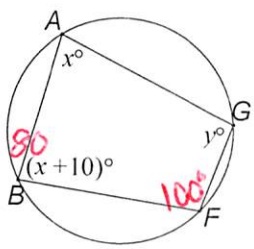
23. $\overline{XY}$ and $\overline{ZY}$ are tangent. The measure of $\angle XWZ = 60^0$. Find the measure of $\angle XYZ$.

$60 + \angle XYZ = 180$
$\angle XYZ = 120$



24. $m\angle F = 100^0$

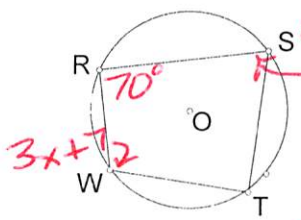
Find x = 80 Find y = 90



$100 + x = 180$
$x = 80$
$(x+10) + y = 180$
$80 + 10 + y = 180$
$90 + y = 180$
$y = 90$

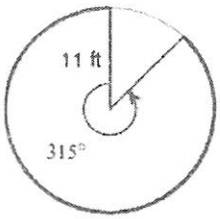
25. $m\angle W = 3x + 7$, $m\angle S = 4x - 9$, $m\angle R = 70^0$

Find $m\angle T$ = 110° Find x = 26



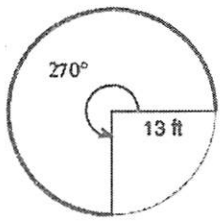
$3x + 7 + 4x - 9 = 180$
$7x - 2 = 180$
$7x = 182$
$x = 26$

$70 + \angle T = 180$
$\angle T = 110$



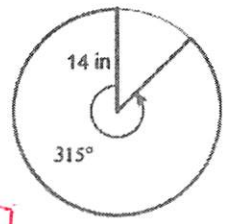
26.
Arc Length = $\frac{315}{360} \cdot 2\pi(11) \approx 60.48$ ft

Sector Area = $\frac{315}{360} \cdot \pi(11^2) \approx 332.62$ ft^2



27.
Arc Length = $\frac{270}{360} \cdot 2\pi(13) \approx 61.26$ ft.

Sector Area = $\frac{270}{360} \cdot \pi(13^2) \approx 398.2$ ft^2



28.
Arc Length = $\frac{315}{360} \cdot 2\pi(14) \approx 76.97$ in.

Sector Area = $\frac{315}{360} \cdot \pi(14^2) \approx 538.78$ in^2

29. If a central angle measures 145 degrees and creates a sector with an area if $200\pi\ cm^2$, what is the radius of the circle?

$200\pi = \frac{145}{360} \cdot \pi r^2$

$200 = \frac{145}{360} r^2$

$r^2 = 496.55$

$r = 22.28$ cm

30. The diameter of a pie is 10 in. The pie is cut into 8 slices. What is the arc length and sector area of each slice?

Arc Length $= \frac{1}{8} \cdot \pi(10) = 3.93$ in or $\frac{5\pi}{4}$

Sector Area $= \frac{1}{8} \cdot \pi(5^2) = 9.82$ in^2 or $\frac{25\pi}{8}$

31. The radius of a bike wheel is 12 inches. There are 9 spokes on the wheel. What is the length between each spoke?

Arc Length $= \frac{1}{9} \cdot 2\pi(12) = 8.38$ in or $\frac{8\pi}{3}$ in

32. There are two pies each with a diameter of 12 in. One pie is cut into 6 slices. The other is cut into 10 slices. Which pie has more area per slice and by how much?

d = 12 in, 6 slices

Sector area $= \frac{1}{6} \cdot \pi(6^2) = 6\pi$ in^2 or 18.85 in^2

d = 12 in, 10 slices

$\frac{1}{10} \cdot \pi(6^2) = 11.31$ in^2 or 3.6π in^2

more by $\frac{12\pi}{5}$ or 7.54 in^2

33. A circular track has a diameter of 100 yards. A track athlete sprints around half the track. How far did the athlete sprint?

Arc Length $= \frac{1}{2} \cdot 2\pi(50) = 50\pi$ yds or 157.08 yds