NCM3

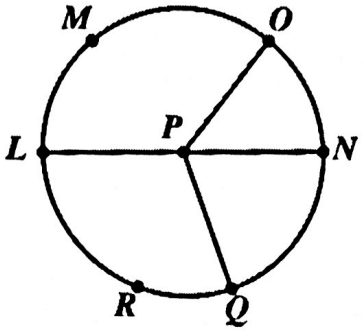
Exam Review – Unit 7 Circles

Name: Key

I. Identify and name arcs:

In circle P, $\overline{LN}$ is a diameter.

Name the following:

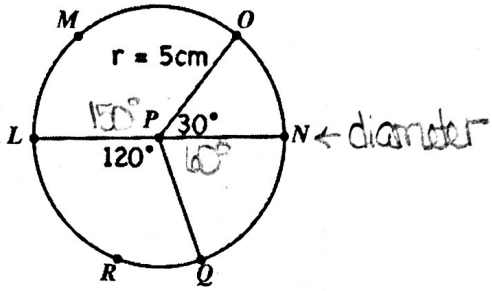


1. 2 minor arcs EX. $\widehat{LM}$, $\widehat{MO}$
2. 2 major arcs EX. $\widehat{LOQ}$, $\widehat{LRO}$
3. 2 semi-circles EX $\widehat{LMN}$, $\widehat{LRN}$
4. 1 acute central angle EX. ∠OPN
5. 1 obtuse central angle EX. ∠LPO
6. 1 diameter LN

II. Using Circle P to the right answer the following:

Calculate the following arc lengths:

Arc Length $\frac{\text{central}}{360} \cdot 2\pi r$



7. $\widehat{NO}$ 2.62 cm
8. $\widehat{LQ}$ 10.47 cm
9. $\widehat{NQ}$ 5.24 cm
10. $\widehat{LMQ}$ 20.94 cm
11. $\widehat{LO}$ 13.09 cm

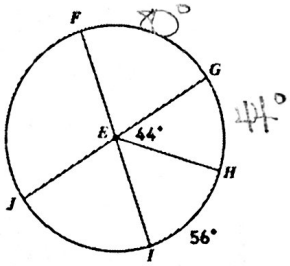
Calculate the following sector areas:

Sector Area $\frac{\text{central}}{360} \cdot \pi r^2$

12. *Sector NPQ* 13.09 cm²
13. *Sector LPO* 33.72 cm²
14. *Sector NPO* 6.54 cm²
15. *Sector LPQ* (intercepts $\widehat{LQ}$) 26.18 cm²
16. *Semicircle* $\widehat{LMN}$ 39.27 cm²

III. Determine the Arc or Angle Measures:

17. $m\widehat{HF}$ = 124°

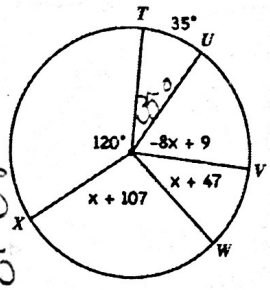


• FI is a diameter

$m\widehat{FG} = 180° - (44° + 56°) = 80°$

$m\widehat{HF} = 80° + 44° = 124°$

18. $m\widehat{VW}$ = 40°



$360° - (120° + 35°) = 205°$

$-8x + 9 + x + 47 + x + 107 = 205$

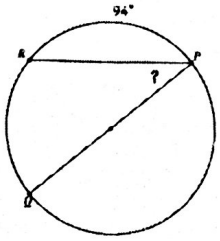
$-6x + 163 = 205$

$-6x = 42$

$x = -7$

$x + 47 = -7 + 47 = 40$

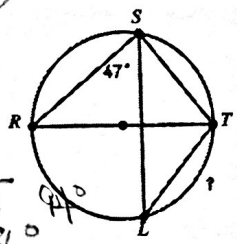
19. $m\angle QPR$ = 43°



$m\widehat{QR} = 180 - 94 = 86$

$m\angle QPR = \frac{1}{2}(86°) = 43°$

20. $m\widehat{TL}$ = 86°

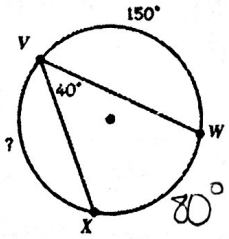


$m\widehat{RL} = 2(47°) = 94°$

• RT is a diameter

$m\widehat{TL} = 180° - 94° = 86°$

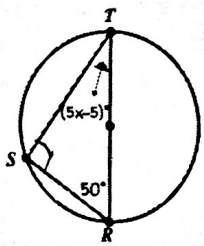
21. $m\widehat{VX}$ = 130°



$m\widehat{XW} = 2(40) = 80$

$m\widehat{VX} = 360° - (150° + 80°) = 130°$

22. solve for x = 9



$m\angle RST = \frac{1}{2}(180°) = 90°$

• All 3 ∠'s of a △ add up to 180°

$90 + 50 + 5x - 5 = 180$

$5x + 135 = 180$

$5x = 45$

$x = 9$

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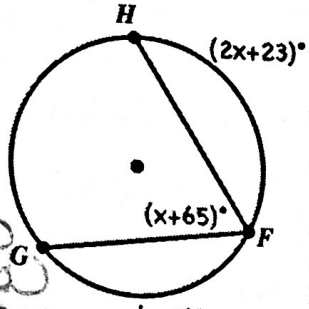
23. solve for x



$m\widehat{HG} = 2(x+65)$

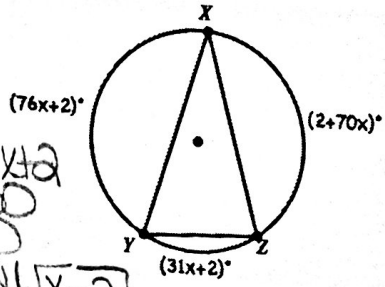
There are 360° in a circle

$2(x+65)+2x+23+x+7=360$

$2x+130+2x+23+x+7=360$

$5x+160=360$ $5x=200$ $\boxed{x=40}$

24. solve for x



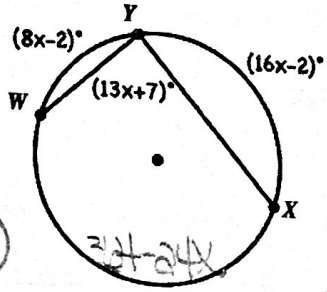
There are 360° in a circle

$76x+2+2+70x+31x+2=360$

$177x+6=360$

$177x=354$ $\boxed{x=2}$

25. solve for x



$8x-2+16x-2+m\widehat{WX}=360$

$24x-4+m\widehat{WX}=360$

$m\widehat{WX}=364-24x$

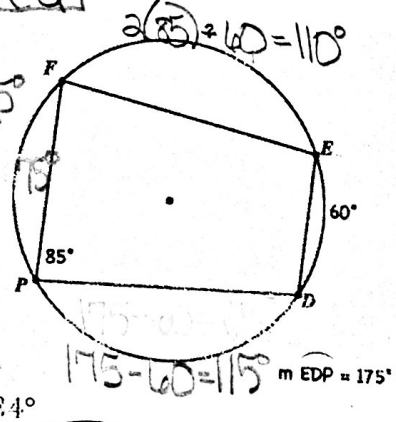
$13x+7=\frac{1}{2}(364-24x)$

$26x+14=364-24x$

$50x=350$

$\boxed{x=7}$

26. Find the following:



a) $m\angle F =$ $\frac{1}{2}(360-115)=87.5°$

b) $m\angle E =$ $\frac{1}{2}(360-115)=95°$

c) $m\angle D =$ $\frac{1}{2}(360-115)=95°$

d) $m\widehat{EF} =$ 110°

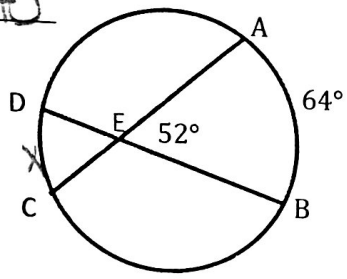
e) $m\widehat{DP} =$ 115°

f) $m\widehat{PF} =$ 75°

$2(85)+60=110°$

$175-60=115°$

27. $m\widehat{CD} =$ 40°



Vertex inside circle

$52=\frac{1}{2}(x+64)$

$104=x+64$

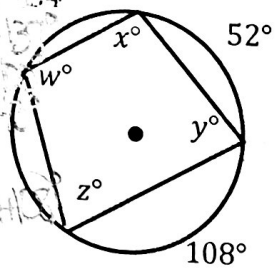
$40=x$

28. w = 34°

x = 52°

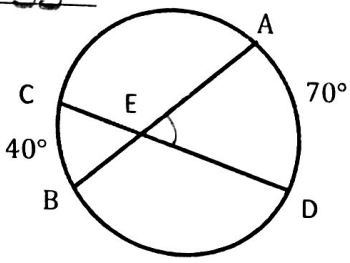
y = 108°

z = 116°



$360-(34+52+108)$
$=166°$

29. $m\angle AED =$ 55°

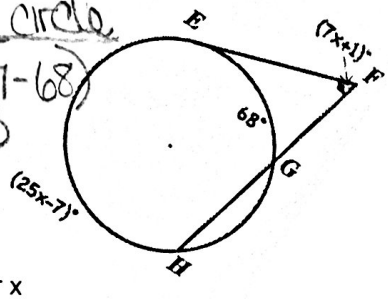


Vertex inside circle

$m\angle AED=\frac{1}{2}(40+70)$

$m\angle AED=55°$

30. solve for x



Vertex outside circle

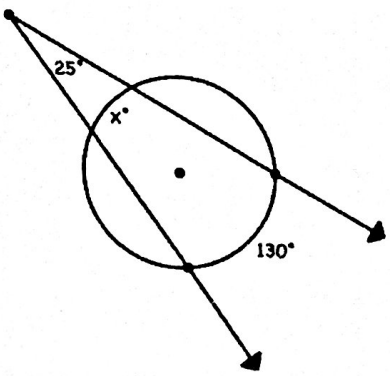
$7x+1=\frac{1}{2}(25x-7-68)$

$14x+2=25x-75$

$77=11x$

$\boxed{7=x}$

31. solve for x



Vertex outside circle

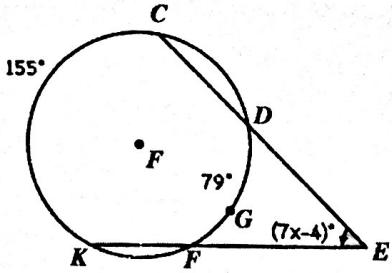
$25=\frac{1}{2}(130-x)$

$50=130-x$

$-80=-x$

$\boxed{80°=x}$

32. solve for x



$7x-4=\frac{1}{2}(155-79)$

$7x-4=38$

$7x=42$

$\boxed{x=6}$

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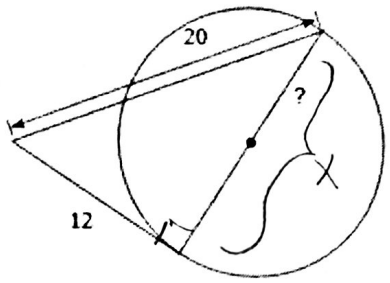
IV. Segments in Circles:

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

a) Find the length of the radius.



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

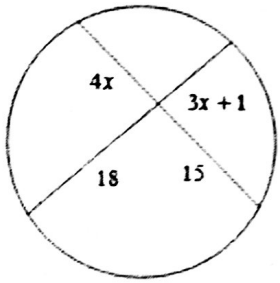
$x^2+144=400$

$x^2=256$

$x=16$

Radius $=\frac{1}{2}x=\frac{1}{2}(16)=8$

b) Solve for x.



$4x(15)=18(3x+1)$

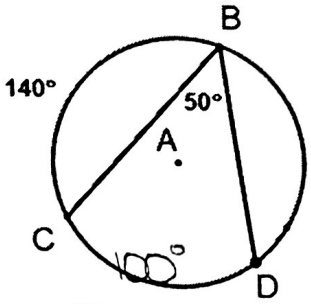
$60x=54x+18$

$6x=18$

$x=3$

V. Multiple Choice: Please write your answer choices in the boxes above

34. Find the measure of $\widehat{BD}$

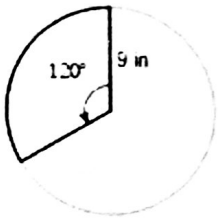


a. 140°
b. 100°
c. 170°
d. 120°

$m\widehat{CD}=2(50°)=100°$

$m\widehat{BD}=360°-(140°+100°)$
$=120°$

35. Find the area of the shaded region if the radius is 9 in.



a. $763.4\ ft.^2$
b. $84.8\ ft.^2$ * in^2, not ft^2
c. $18.8\ ft.^2$
d. $169.6\ ft.^2$

Sector Area $=\frac{120}{360}\cdot\pi(9)^2$

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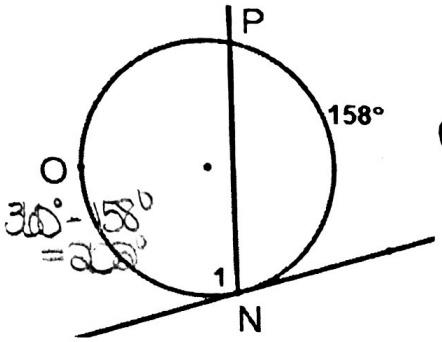
36. Find $m\angle 1$.

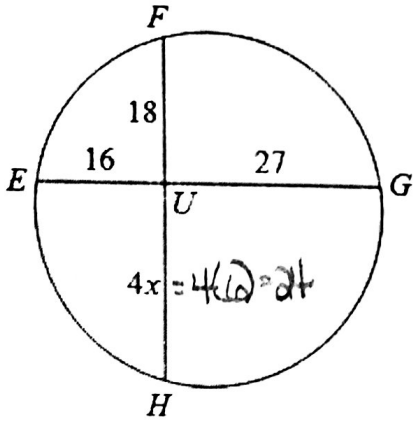


$360° - 158° = 202°$

a. 158°
b. 79°
c. 101°
d. 202°

$m\angle 1 = \frac{1}{2}(202°)$

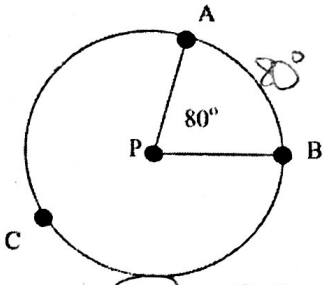
37. Find the length of segment *FH*.



A) 26 B) 42
C) 58 D) 43

$16(27) = 18(24+x)$
$432 = 432 + 18x$
$6 = x$

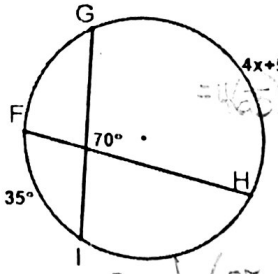
38. What is the measure of arc ACB?



a. 280°
b. 200°
c. 160°
d. 80°

$m\widehat{ACB} = 360 - 80 = 280°$

39. Find $m\widehat{GH}$.

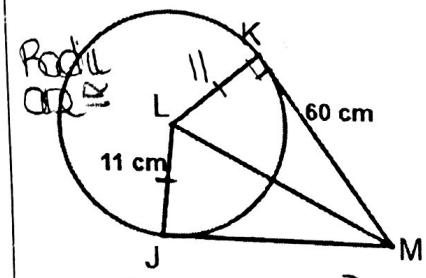


$= 4(5)+5$

a. 25°
b. 35°
c. 70°
d. 105°

$70° = \frac{1}{2}(35 + 4x + 5)°$
$140° = 4x + 40°$ $x = 25°$

40. If $\overline{KM}$ and $\overline{JM}$ are tangent to circle L. What is the length of $\overline{LM}$.

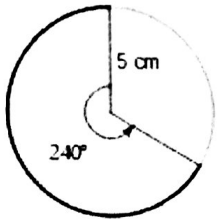


Radii are ≅

a. 11 cm
b. 59 cm
c. 60 cm
d. 61 cm

$11^2 + 60^2 = LM^2$
$3721 = LM^2$

41. Find the arc length.



a. $52.4m$
b. $20.9m$ * cm, not m
c. $117.8m$
d. $47.1m$

Arc length $= \frac{240}{360} \cdot 2\pi(5)$