Sol

Geometry GT: Circles Unit Review

Textbook Sections:
Chapter 10.1-10.8

**PLEASE MAKE SURE TO KNOW YOUR THEOREMS. Most of the theorems do not have names, so don't worry about making one up. Please be familiar with what each theorem says (because this will be what you will put as a reason on a proof ... if there are proofs to do ☺)

1. Define the following parts of a circle:
   a. Circle
   b. Center
   c. Radius
   d. Diameter
   e. Chord
   f. Secant
   g. Tangent
   h. Central Angle
   i. Inscribed Angle
   j. Interior Angle
   k. Exterior Angle
   l. Tangent Segment

2. What is the relationship between the measure of a central angle and its intercepted arc? Inscribed angle and its intercepted arc? Interior angle and its intercepted arcs? Exterior angle and its intercepted arcs?

3. What is the relationship between the arcs of congruent chords? The distance from the center to two congruent chords?

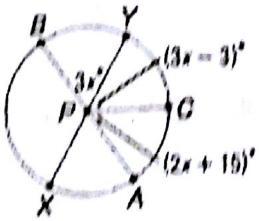
4. What is the relationship between a tangent and a radius that meets at the point of tangency?

5. How do we prove congruent triangles? How do we prove similar triangles?

PRACTICE

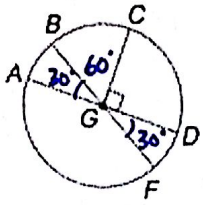
Exercises **Find each measure.**
See Example 1 on page 529.

17. $m\widehat{YC}$ 60°
18. $m\widehat{BC}$ 123°
19. $m\widehat{BX}$ 117°
20. $m\widehat{BCA}$ 180°



$3x + 3x - 3 + 2x + 15 = 180$
$8x + 12 = 180$
$8x = 168$
$x = 21$

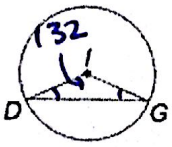
In ⊙G, $m\angle AGB = 30$ and $\overline{CG} \perp \overline{GD}$. **Find each measure.** *See Example 2 on page 531.*



21. $m\widehat{AB}$ 30°
22. $m\widehat{BC}$ 60°
23. $m\widehat{FD}$ 30°
24. $m\widehat{CDF}$ 120°
25. $m\widehat{BCD}$ 150°
26. $m\widehat{FAB}$ 180°

Find the length of the indicated arc in each ⊙I. *See Example 4 on page 532.*

27. $\widehat{DG}$ if $m\angle DGI = 24$ and $r = 6$

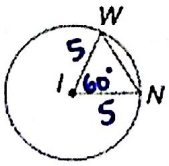


$\frac{132}{360} = \frac{x}{12\pi}$

$12\pi \cdot \frac{132}{360} = x$

$\boxed{x = \frac{22}{5}\pi}$

28. $\widehat{WN}$ if $\triangle IWN$ is equilateral and $WN = 5$



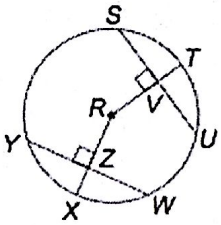
$\frac{60}{360} = \frac{x}{10\pi}$

$10\pi \cdot \frac{60}{360} = x$

$\frac{600\pi}{360} = x$

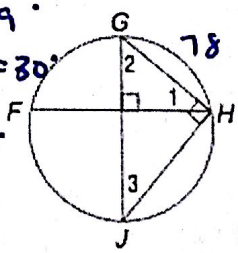
$\boxed{\frac{5}{3}\pi = x.}$

Exercises In ⊙R, $SU = 20$, $YW = 20$, and $m\widehat{YX} = 45$. **Find each measure.** *See Example 3 on page 538.*



29. SV 10
30. WZ 10
31. UV 10
32. $m\widehat{YW}$ 90°
33. $m\widehat{ST}$ 45°
34. $m\widehat{SU}$ 90°

Find the measure of each numbered angle for each situation given. *See Example 4 on page 547.*



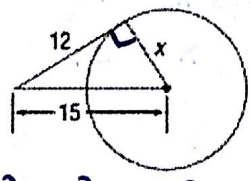
38. $m\widehat{GH} = 78$ $m\angle 1 = 38°$ $m\angle 2 = 51°$ $m\angle 3 = 39°$
39. $m\angle 2 = 2x, m\angle 3 = x$ $m\angle 1 =$ 30° $m\angle 2 = 60°$ $m\angle 3 = 30°$
40. $m\widehat{JH} = 114$ $m\angle 1 = 33°$ $m\angle 2 = 57°$ $m\angle 3 = 33°$

$2x + x + 90 = 180$

$3x = 90$ $x = 30$

Exercises Find x. Assume that segments that appear to be tangent are tangent. *See Example 3 on page 554.*

41.

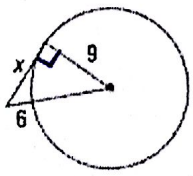


$x^2 + 12^2 = 15^2$

$x^2 = 81$

$x = 9$

42.

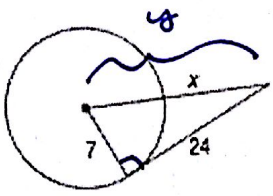


$x^2 + 9^2 = 15^2$

$x^2 = 144$

$x = 12$

43.



$7^2 + 24^2 = y^2$

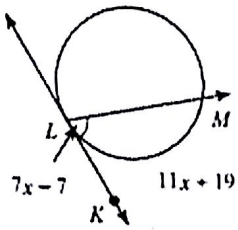
$625 = y^2$

$y = 25$

$\boxed{x = 25 - 7}$

$x = 18$

23) Find $m\angle MLK$



A) 55° B) 65°
C) 60° D) 70°

$\frac{11x+19}{2} = 7x-7$

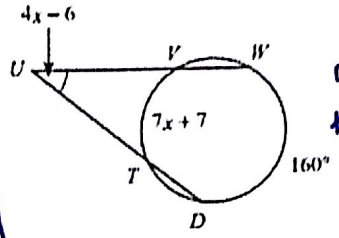
$11x+19 = 14x-14$

$33 = 3x$

$x = 11$

$m\angle MLK = 7(11)-7$
$= 70$

24) Find $m\angle WUD$



A) 38° B) 35°
C) 52° D) 34°

$\frac{160-(7x+7)}{2} = 4x-6$

$160-7x-7 = 8x-12$

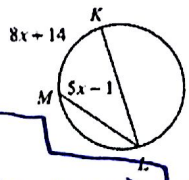
$153-7x = 8x-12$

$165 = 15x$

$x = 11$

$m\angle WUD = 4(11)-6$
$= 38°$

15) Find $m\widehat{KLM}$



$\frac{8x+14}{2} = 5x-1$

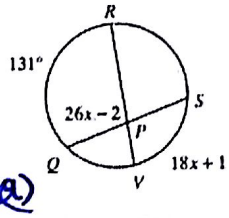
$8x+14 = 10x-2$

$16 = 2x$

$x = 8$

$m\widehat{KLM} =$
$360-(8\cdot 8+14)$
$= 282$

16) Find $m\angle QPR$



$\frac{131+18x+1}{2} = 26x-2$

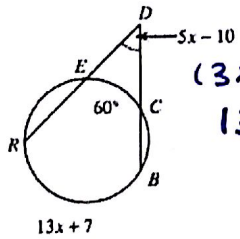
$131+18x+1 = 52x-4$

$136 = 34x$

$x = 4$

$m\angle QPR = 26(4)-2 = 102$

17) Find $m\widehat{RB}$



$\frac{3x+7-60}{2} = 5x-10$

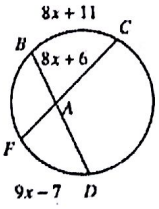
$3x+7-60 = 10x-20$

$13x-53 = 10x-20$

$3x = 33$

$x = 11$

18) Find $m\widehat{BC}$



$\frac{8x+11+9x-7}{2} = 8x+6$

$8x+11+9x-7 = 16x+12$

$17x+4 = 16x+12$

$x = 16$

$m\widehat{BC} = 8(16)+11$
$= 139$

Exercises **Write an equation for each circle.** *See Examples 1 and 2 on pages 575 and 576.*

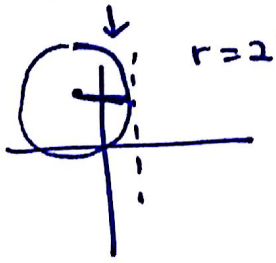
50. center at (0, 0), $r = \sqrt{5}$ $x^2+y^2=5$

51. center at (−4, 8), $d = 6$ $(x+4)^2+(y-8)^2=9$

52. diameter with endpoints at (0, −4) and (8, −4) $r=4$ (center: (4, −4)

$(x-4)^2+(y+4)^2=16$

53. center at (−1, 4) and is tangent to $x = 1$



$r=2!$

$(x+1)^2+(y-4)^2=4$