12.2 Arcs and Chords

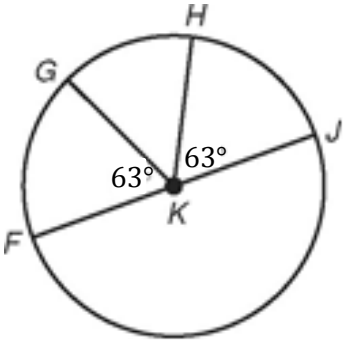
12.2.a Learning Target: Apply properties of arcs.
12.2.b Learning Target: Apply properties of chords

Part 1: Key Vocabulary

Match the letter of the part of the figure to the names. (12.2.a)

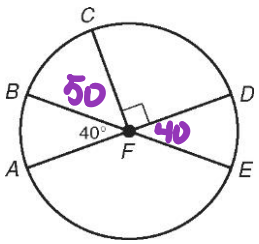
1. Central Angle D
2. Minor Arc F
3. Major Arc A
4. Semi-circle E
5. Adjacent Arcs B
6. Congruent Arcs C

A) $\widehat{GHF}$
B) $\widehat{GF}$ and $\widehat{GH}$
C) $\widehat{GF}$ and $\widehat{HJ}$
D) ∠GKH
E) $\widehat{FJ}$
F) $\widehat{GH}$

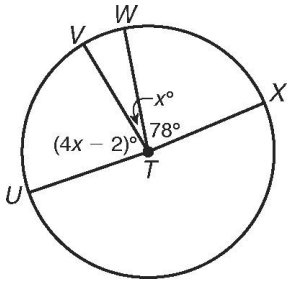


Practice: Use the diagram below to answer the following questions. (12.2.a)

1. How are central angles related to their intercepted arcs? They are ≅/the same



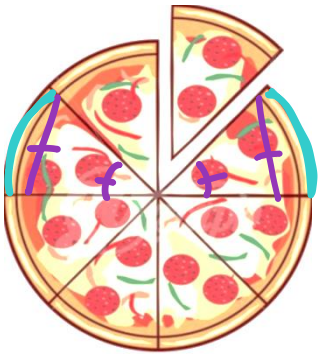
2. Find: $m\widehat{BC}$ = 50°
   40+x+90=180 ⇒ x=50
   $m\widehat{AD}$ = 180°
   $m\widehat{CE}$ = 130°
   vertical ∡ to ∡BFA
   $m\widehat{ADB}$ = 320°
   360 - 40 = 320



3. Find: the value of x = 20.8

4x-2+x+78=180
5x+76=180
5x=104
$\boxed{x=20.8}$

Part 2: Angle-Chord Theorems



① ≅ central ∡s have ≅ chords

② ≅ chords have ≅ arcs

③ ≅ arcs have ≅ central ∡s

Need to know this to solve!

1. Given: the diagram

Find the $m\widehat{TV}$ = 88°

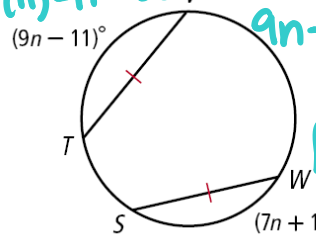
$\widehat{TV} \cong \widehat{SW}$

$9(11)-11 = 88°$

$9n-11 = 7n+11$

$2n = 22$

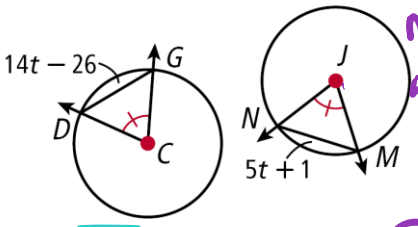
$\boxed{n = 11}$



2. Given: $\overline{C} \cong \overline{J}$

Find the m∠NJM = 16°

Find the $m\widehat{DG}$ = 16°



$\overline{DG} \cong \overline{NM}$

$14t - 26 = 5t + 1$

$9t = 27$

$\boxed{t = 3}$

m∠NJM =

$5(3)+1$

$\boxed{16°}$

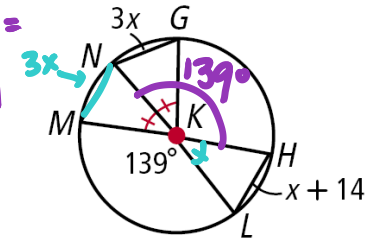
$m\widehat{DG} = 14(3) - 26$

$\boxed{m\widehat{DG} = 16}$

3. Given: the diagram

Find the $m\widehat{NGH}$ = 139°

Find MN = 21



$3x = x + 14$

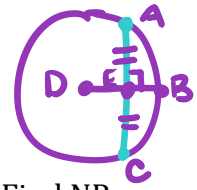
$2x = 14$

$x = 7$

$\boxed{MN = 3(7) = 21}$

Part 3: Radius-Tangent Theorem

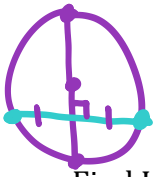
① If Radius/Diameter is ⊥ to chord ⇒ bisects chord & arc



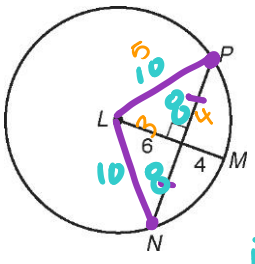
$\overline{AE} \cong \overline{EC}$

$\widehat{AB} \cong \widehat{BC}$

② ⊥ bisector of a chord is a radius (or diameter)



1. Find NP



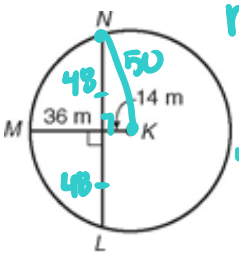
radius = 10

3-4-5 triple

$NP = 2(8)$

$\boxed{NP = 16}$

2. Find LN



radius = 50m

7-24-25 triple

$LN = 2(48)$

$\boxed{LN = 96m}$