

## 9.1 Central and Inscribed Angles

Circle	
Diameter	
Radius	
Chord Segment that does not go through center of circle	

1) Identify parts of the circle

a. Name the circle

⊙L

b. Name a radius of the circle

GL, HL, JL, KL, IL

c. Name a chord of the circle

HI

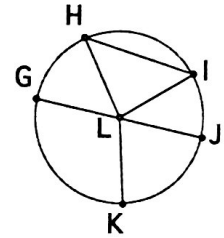
d. Name a diameter of the circle

GJ

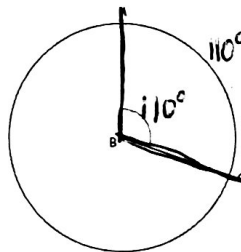
e. if  $GL = 10$ ,  $JL = 10$

f. if  $JG = 7$ ,  $LG = 3.5$

g. if  $LK = 4.2$ ,  $HL = 4.2$



**Central Angle:**  
An angle with vertex at center of circle  
\* A central angle has the same measure as its intercepted arc \*



$m\angle ABC = 110^\circ$   
 $m\widehat{AC} = 110^\circ$

Less than  $180^\circ$

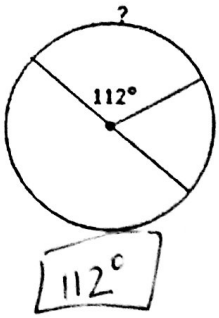
More than  $180^\circ$

Type of Arc	Minor Arc	Major Arc	Semicircle
Example			
Named	$\widehat{AC}$	$\widehat{DEF}$	$\widehat{JML}$ or $\widehat{JKL}$
Arc Degree	$110^\circ$	$300^\circ$	$180^\circ$

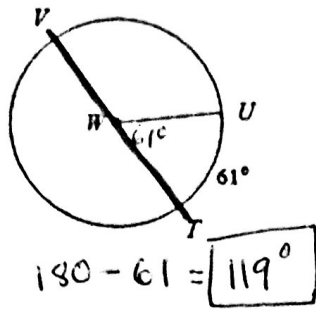
$360 - 60 = 300$

2) Find the arc measure or angle indicated:

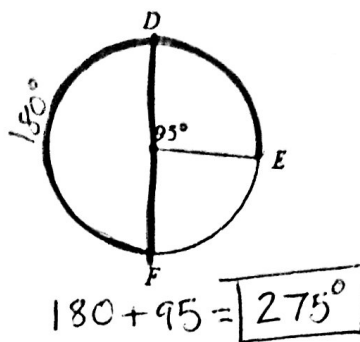
a)



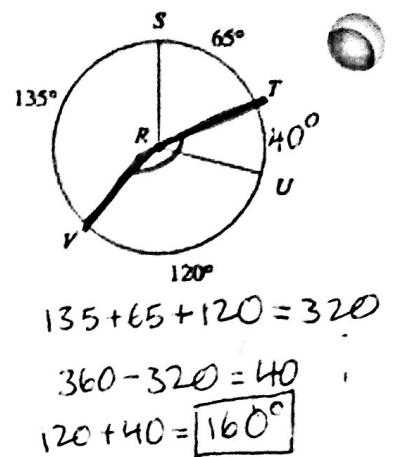
b)  $m\angle VWU$



c)  $m\widehat{FDE}$



d)  $m\angle TRV$

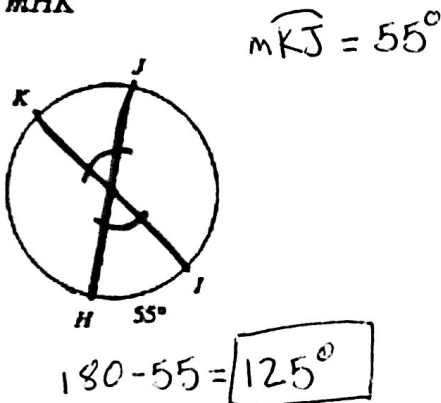


\* Half Circle:  $180^\circ$  \* Full Circle:  $360^\circ$  \*

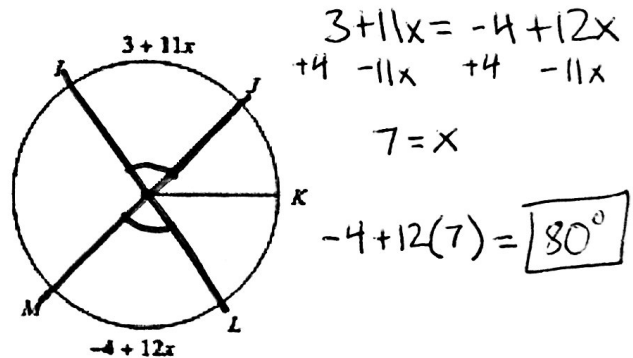
Tip #1 Highlight diameters

Tip #2 Two diameters make vertical angles

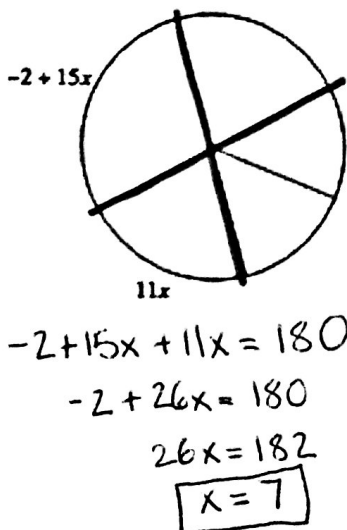
e)  $m\widehat{HK}$



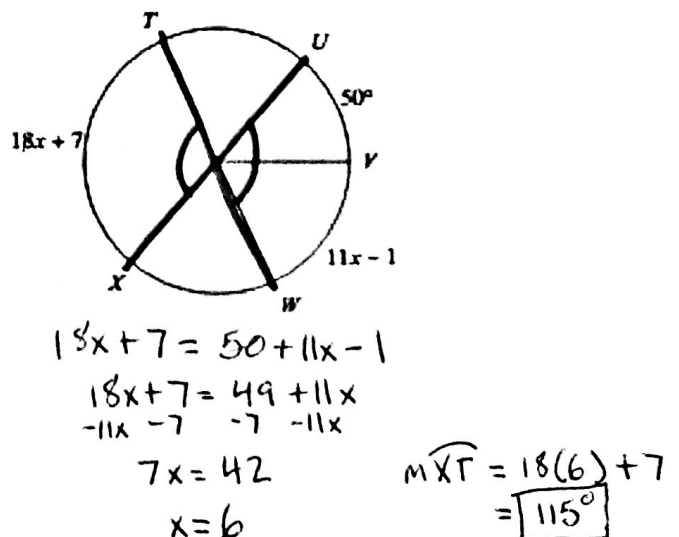
f)  $m\widehat{LM}$



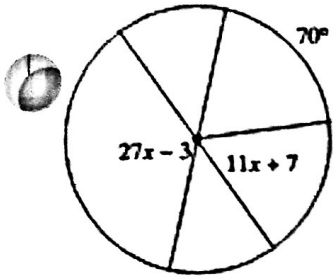
g) Solve for x.



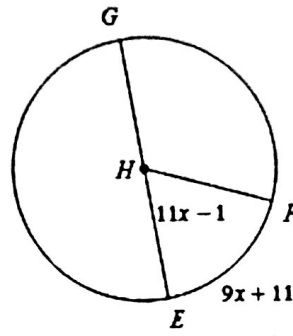
h)  $m\widehat{XT}$



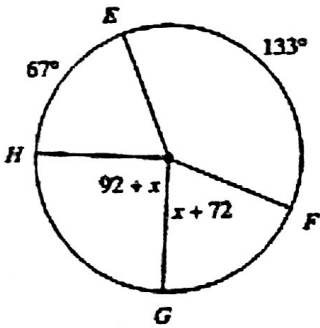
i) Solve for x.



j)  $m\angle FHE$

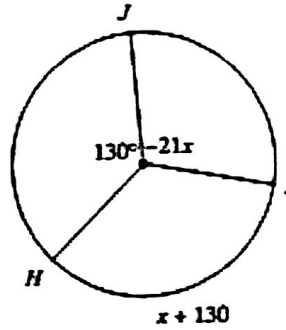


k)  $m\widehat{FG}$



$$m\widehat{FG} = -2 + 72 = \boxed{70^\circ}$$

l)  $m\widehat{IH}$



$$67 + 133 + 92 + x + x + 72 = 360$$

$$2x + 364 = 360$$

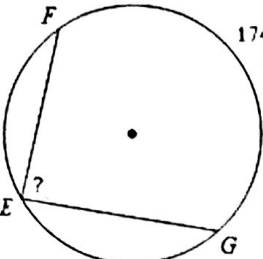
$$2x = -4$$

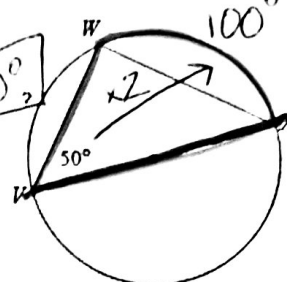
$$x = -2$$

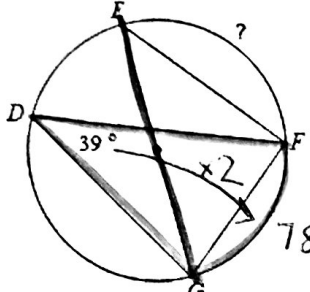
An inscribed angle is an angle that is formed by two chords that share a common endpoint. You will see inscribed angles in two different ways:

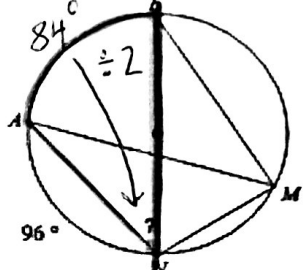
Example of inscribed angle	Rule
	<p>The measure of the inscribed angle is half the measure of the intercepted arc</p> <p>OR...</p>
	<p>The measure of the intercepted arc is twice the measure of the inscribed angle</p>

4) Find the measure of the missing arc or inscribed angle.

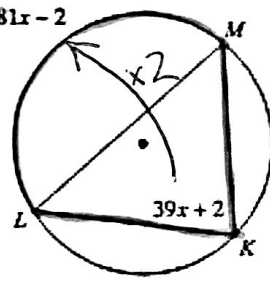
a)   $\frac{174}{2} = \boxed{87^\circ}$

b)   $180 - 100 = 80$

c)   $180 - 78 = \boxed{102^\circ}$

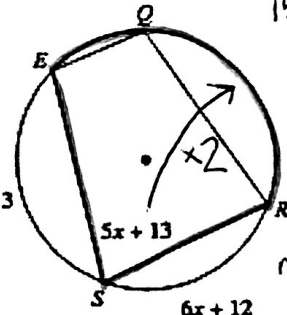
d)   $180 - 96 = 84$   
 $\frac{84}{2} = \boxed{42^\circ}$

e) Find  $m\widehat{LM}$

  $2(39x+2) = 81x-2$   
 $-78x + 4 = 81x - 2$   
 $-78x + 2 = 78x + 2$   
 $\frac{6}{3} = \frac{3x}{3}$   
 $2 = x$

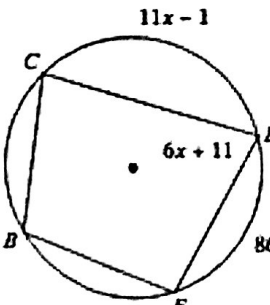
$m\widehat{LM} = 81(2) - 2 = \boxed{160^\circ}$

f) Find  $m\widehat{RS}$

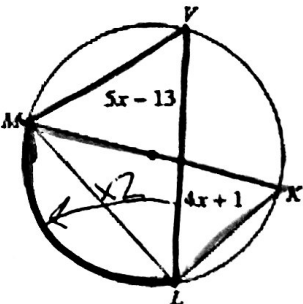
  $9x-3 + 6x+12 + 2(5x+13) = 360$   
 $15x + 9 + 10x + 26 = 360$   
 $25x + 35 = 360$   
 $25x = 325$   
 $x = 13$

$m\widehat{RS} = 6(13) + 12 = \boxed{90^\circ}$

g) Find  $m\angle EDC$



h) Find  $m\widehat{LM}$

  $5x-13 = 4x+1$   
 $-4x+13 = -4x+13$   
 $x = 14$

$2(4(14)+1) = 2(57) = \boxed{114^\circ}$

Since the angles correspond to the same arc, the measures of the inscribed angles are the same.