

## Geometry Honors – Dr Sargent – Periods 4 & 8 - Packet 2 – Work for April 13-24

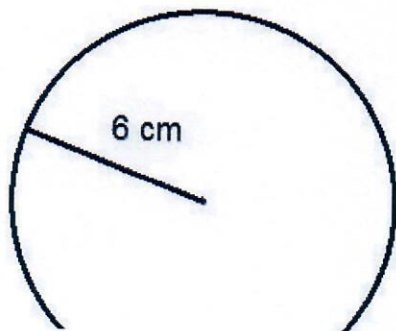
### Week of April 13-17 –

During this week, you should review the material on transformations, and then complete the test on Unit 9 found on ALEKS. You may take the test a maximum of three times, and I will record your highest score. My suggestion is that you complete it once as a review, then go back and re-study any parts you missed, and then take it a second and/or third time. I am counting on you to be honest and do your own work on the test.

### Week of April 20-24 –

We begin the unit on circles this week. I am attaching two pages of vocabulary words, Please begin studying these carefully, and learn what each means. I am also attaching a worksheet on identifying the parts of circles. You do NOT need to return this to me – this is to help you gain an understanding of the parts of circles.

Assignment 1 involves the area, circumference, radius and diameter of a circle. This should probably be review for most of you. The formula for the area of a circle, where  $r$  is the radius, is:  $A = \pi r^2$ . The formula for the circumference of a circle is:  $C = 2\pi r$ . (or, alternatively,  $C = \pi d$ , where  $d$  is the diameter). So, consider the circle below:



The circle to the left has a radius of 6cm. The area of the circle would therefore be:  $A = \pi r^2 = \pi 6^2 = \pi(36) = 113.1 \text{ cm}^2$

The circumference would be:  $C = 2\pi r = 2\pi 6 = 12\pi = 37.7 \text{ cm}$

Notice that the area is always something squared (square centimeters in this case), whereas the circumference is a linear measurement (just centimeters).

The diameter is always twice the radius, so the diameter of the circle is:  $d = 2r = 2(6) = 12 \text{ cm}$

Once you understand this, you are ready to tackle Homework 10-1 on ALEKS. I can also provide a written copy for any of you who need it.

Assignment 2 involves central angles and arc measures. I have attached a worksheet which you can use to help learn this information. A central angle is an angle with its vertex at the center of the triangle and its two sides are radii (plural of radius). For example, on your worksheet,  $\angle ABC$  is a central angle in the circle illustration. The sum of all central angles in a circle is  $360^\circ$ .

The measure of the arc formed by the endpoints of a central angle is equal to the degrees of the central angle. Thus, in the illustration,  $m\widehat{AC} = 84^\circ$ , and  $m\widehat{ADC} = 276^\circ$ . Please notice that when we use two letters to designate an arc, this will always refer to an arc that is less than  $180^\circ$  (which we call a “minor arc”). To name an arc greater than  $180^\circ$  (which we call a “major arc”), we must use three letters with the first and third being the endpoints of the arc, and the middle being between the two in the direction we wish to travel to get to the other endpoint of the arc. Thus, in the illustration on your paper, we would begin  $\widehat{ADC}$  with point A, then travel around through point D to point C, and thus we are measuring the larger arc (the major arc), not the smaller or minor arc.

With this in mind, you are now ready to complete the worksheet on central angles and arc measure. You do NOT need to return this to me. When you have completed the worksheet, you are then ready to begin Homework 10-2, which is also attached. This should be returned to me when you are finished. You can take a picture of it and attach that picture to a message; or you can scan it and attach the scan; or you can return the homework to the school between 9-11 am any week day; or you can send me a message with just the answers, clearly labeled as Homework 10-2 and with each answer clearly numbered.

Ongoing ALEKS assignment: Please remember that your regular weekly assignment of 12 topics continues as normal. If you get stuck, please do not hesitate to ask questions.

Answers to select questions: (Please try and do the work yourself before checking answers)

Worksheet on Central Angles and Arc Measures:

Question 1:  $m\widehat{ST} = 122^\circ$ ;  $m\widehat{RS} = 58^\circ$ ;  $m\widehat{SRT} = 238^\circ$

Question 3:  $m\angle UXV = 72^\circ$ ;  $m\widehat{ST} = 21^\circ$ ;  $m\widehat{WV} = 108^\circ$ ;  $m\widehat{TW} = 93^\circ$ ;  $m\widehat{TVW} = 267^\circ$

Question 6:  $15x - 26 = 154$ ;  $15x = 180$ ;  $x = 12$

Question 8:  $10x - 22 = 8x + 12$ ;  $2x = 34$ ;  $x = 17$ ;  $m\widehat{AD} = 148^\circ$ ;  $m\widehat{CD} = 32^\circ$ ;  $m\widehat{BDC} = 212^\circ$

Question 10:

$8x + 21x - 12 + 10x + 9 = 270$ ;  $39x - 3 = 270$ ;  $x = 7$ ;  $m\widehat{WX} = 135^\circ$ ;  $m\widehat{YW} = 146^\circ$ ;  $m\widehat{YX} = 79^\circ$ ;  $m\widehat{VXW} = 304^\circ$

Homework 10-2:

Question 1:  $m\widehat{JL} = 127^\circ$ ;  $m\widehat{JML} = 233^\circ$

Question 4:  $m\widehat{TQ} = 69^\circ$ ;  $m\widehat{QR} = 155^\circ$ ;  $m\widehat{TS} = 111^\circ$ ;  $m\widehat{SQR} = 335^\circ$ ;  $m\widehat{RQT} = 224^\circ$

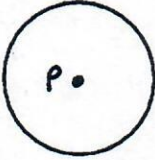
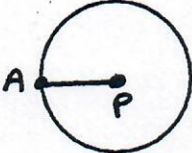

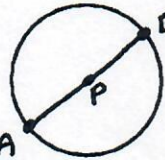
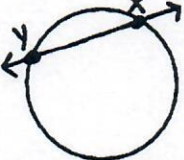
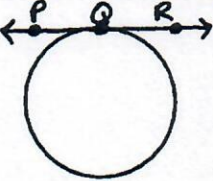
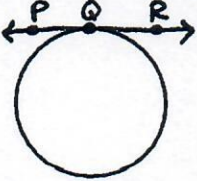
Question 7:  $31 + 9x + 23 = 180$ ;  $9x + 54 = 180$ ;  $9x = 126$ ;  $x = 14$

Question 10:  $2x + 6 + 2(7x - 1) = 180$ ;  $16x + 4 = 180$ ;  $16x = 176$ ;  $x = 11$

Question 12:  $12x - 25 + x - 3 = 180$ ;  $13x - 28 = 180$ ;  $x = 16$ ;  $m\widehat{DE} = 167^\circ$ ;  $m\widehat{EF} = 13^\circ$ ;  $m\widehat{DFG} = 347^\circ$

Question 15:  $12x + 17x - 14 + 2x + 5 = 270$ ;  $31x - 9 = 270$ ;  $31x = 279$ ;  $x = 9$ ;  $m\widehat{AD} = 108^\circ$ ;  $m\widehat{BC} = 23^\circ$ ;  $m\widehat{DC} = 139^\circ$ ;  $m\widehat{DBC} = 221^\circ$

# PARTS OF CIRCLES DICTIONARY

Term	Definition	Example or Visual
<b>CIRCLE</b>	<u>The set of points equidistant</u> <u>from a given point (the center).</u>	 Circle P
<b>RADIUS</b>	<u>A segment with endpoints at</u> <u>the center and on the circle.</u>	
<b>CHORD</b>	<u>A segment with endpoints on</u> <u>the circle.</u>	
<b>DIAMETER</b>	<u>A chord that passes through</u> <u>the center.</u> <u>(Diameter = 2 · radius)</u>	
<b>SECANT</b>	<u>A line that intersects the</u> <u>circle in two places.</u>	
<b>TANGENT</b>	<u>A line that intersects the</u> <u>circle at exactly one place.</u>	
<b>POINT OF TANGENCY</b>	<u>The point at which the</u> <u>tangent line intersects the</u> <u>circle.</u>	

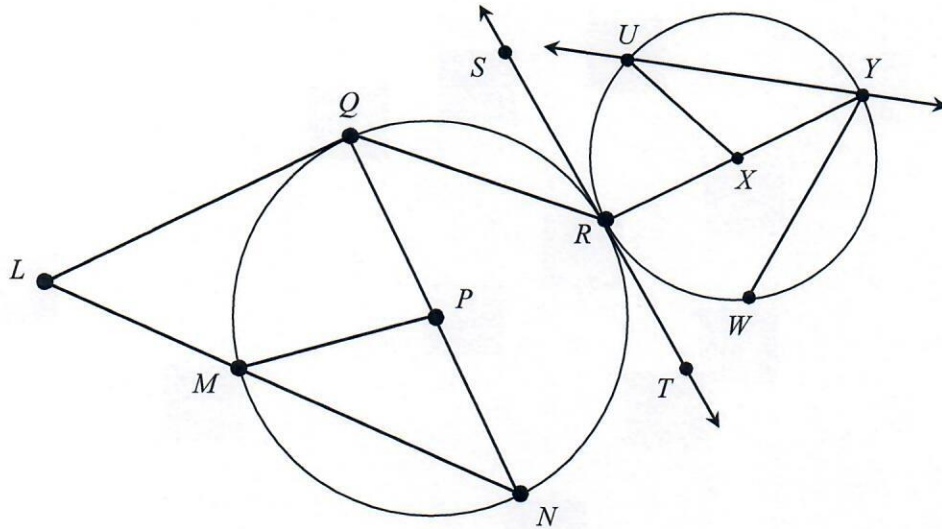
<b>CENTRAL ANGLE</b>	<u>An angle with a vertex at the center, and two sides that are radii.</u>	
<b>INSCRIBED ANGLE</b>	<u>An angle with a vertex on the circle, and two sides that are chords.</u>	
<b>ARC</b>	<u>A portion of the edge of the circle defined by two endpoints.</u> Symbol: $\frown$	
<b>MINOR ARC</b>	<u>An arc with a measure less than <math>180^\circ</math>.</u> <u>* use 2 letters to name it!</u>	
<b>MAJOR ARC</b>	<u>An arc with a measure greater than <math>180^\circ</math>.</u> <u>* use 3 letters to name it!</u>	
<b>SEMICIRCLE</b>	<u>An arc with endpoints on the diameter.</u> <u>* Always equal to <math>180^\circ</math>!</u>	

## FORMULAS

<b>AREA</b>	<b>CIRCUMFERENCE</b>	<b>ARC LENGTH</b>
$A = \pi r^2$	$C = 2\pi r$ (where $r$ = radius)	$l = \frac{x \cdot C}{360}$
(where $r$ = radius)	$C = \pi d$ (where $d$ = diameter)	(where $C$ = circumference and $x$ = degree of arc)

# Name that Circle Part!

**Directions:** Use the diagram below along with the bank to classify each circle part. Parts may be used more than once.



- | Parts of Circles  |  |
|-------------------|--|
| Center            |  |
| Radius            |  |
| Chord             |  |
| Diameter          |  |
| Secant            |  |
| Tangent           |  |
| Point of Tangency |  |
| Minor Arc         |  |
| Major Arc         |  |
| Semicircle        |  |
| Central Angle     |  |
| Inscribed Angle   |  |

1.  $\overline{LQ}$  \_\_\_\_\_

2.  $\overline{WY}$  \_\_\_\_\_

3.  $\angle NQR$  \_\_\_\_\_

4.  $X$  \_\_\_\_\_

5.  $\widehat{RWU}$  \_\_\_\_\_

6.  $\overline{ST}$  \_\_\_\_\_

7.  $\overline{PN}$  \_\_\_\_\_

8.  $\angle UXY$  \_\_\_\_\_

9.  $\widehat{MQ}$  \_\_\_\_\_

10.  $\overline{QN}$  \_\_\_\_\_

11.  $R$  \_\_\_\_\_

12.  $\overline{UY}$  \_\_\_\_\_

13.  $\widehat{QRN}$  \_\_\_\_\_

14.  $\angle MPQ$  \_\_\_\_\_

15.  $\overline{QR}$  \_\_\_\_\_

16.  $\angle UYR$  \_\_\_\_\_

17.  $\widehat{WY}$  \_\_\_\_\_

18.  $\overline{LN}$  \_\_\_\_\_

19.  $\overline{UX}$  \_\_\_\_\_

20.  $\widehat{RUY}$  \_\_\_\_\_

Name:

Date:

Topic:

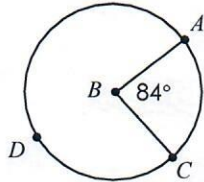
Class:

Main Ideas/Questions

Notes/Examples

# CENTRAL ANGLES

*& Arc Measures*



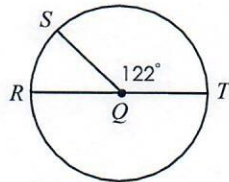
- A **central angle** is an angle with its vertex at the \_\_\_\_\_ of the circle and its two sides are \_\_\_\_\_.
- For example:** \_\_\_\_\_ is a central angle in circle *B* to the left.
- The sum of all central angles in a circle is \_\_\_\_\_.
- The **measure of the arc** formed by the endpoints of a central angle is \_\_\_\_\_.

$$m\widehat{AC} = \underline{\hspace{2cm}}; \quad m\widehat{ADC} = \underline{\hspace{2cm}}$$

# EXAMPLES

**Directions:** Find each angle and arc measures.

1.

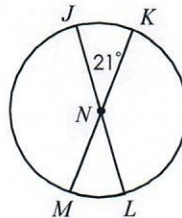


$$m\widehat{ST} = \underline{\hspace{2cm}}$$

$$m\widehat{RS} = \underline{\hspace{2cm}}$$

$$m\widehat{SRT} = \underline{\hspace{2cm}}$$

2.



$$m\widehat{JK} = \underline{\hspace{2cm}}$$

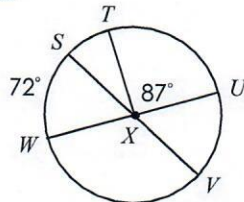
$$m\angle JNM = \underline{\hspace{2cm}}$$

$$m\widehat{KL} = \underline{\hspace{2cm}}$$

$$m\widehat{JKM} = \underline{\hspace{2cm}}$$

$$m\widehat{MKL} = \underline{\hspace{2cm}}$$

3.



$$m\angle UXV = \underline{\hspace{2cm}}$$

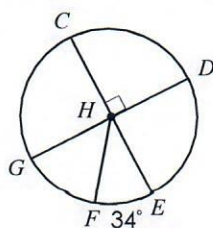
$$m\widehat{ST} = \underline{\hspace{2cm}}$$

$$m\widehat{WV} = \underline{\hspace{2cm}}$$

$$m\widehat{TW} = \underline{\hspace{2cm}}$$

$$m\widehat{TVW} = \underline{\hspace{2cm}}$$

4.



$$m\widehat{CD} = \underline{\hspace{2cm}}$$

$$m\widehat{FD} = \underline{\hspace{2cm}}$$

$$m\widehat{DCF} = \underline{\hspace{2cm}}$$

$$m\widehat{GDF} = \underline{\hspace{2cm}}$$

**5.**

$m\widehat{PQ} =$  \_\_\_\_\_  
 $m\widehat{SR} =$  \_\_\_\_\_  
 $m\widehat{QR} =$  \_\_\_\_\_  
 $m\widehat{PSR} =$  \_\_\_\_\_  
 $m\widehat{PS} =$  \_\_\_\_\_

**6.**

\_\_\_\_\_ =  $x$

**7.**

\_\_\_\_\_ =  $x$

**8.**

\_\_\_\_\_ =  $x$   
 $m\widehat{AD} =$  \_\_\_\_\_  
 $m\widehat{CD} =$  \_\_\_\_\_  
 $m\widehat{BDC} =$  \_\_\_\_\_

**9.**

\_\_\_\_\_ =  $x$   
 $m\widehat{JK} =$  \_\_\_\_\_  
 $m\widehat{ML} =$  \_\_\_\_\_  
 $m\widehat{LMK} =$  \_\_\_\_\_

**10.**

\_\_\_\_\_ =  $x$   
 $m\widehat{WX} =$  \_\_\_\_\_  
 $m\widehat{YX} =$  \_\_\_\_\_  
 $m\widehat{YW} =$  \_\_\_\_\_  
 $m\widehat{XW} =$  \_\_\_\_\_



Name: \_\_\_\_\_

Unit 10: Circles

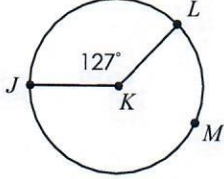


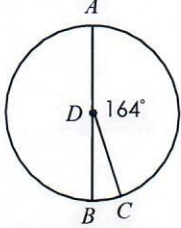
Date: \_\_\_\_\_ Per: \_\_\_\_\_

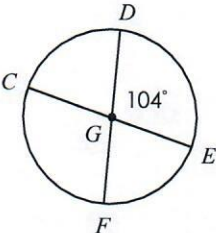
Homework 2: Central Angles & Arc Measures

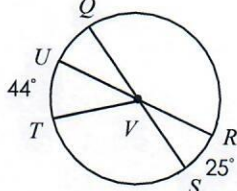
\*\* This is a 2-page document! \*\*

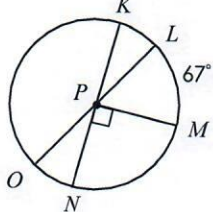
**Directions:** Find the following arc measures.

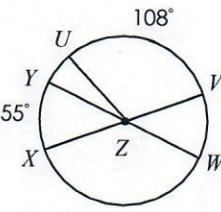
1.   $m\widehat{JL} = \underline{\hspace{2cm}}$   
 $m\widehat{JML} = \underline{\hspace{2cm}}$

2.   $m\widehat{BC} = \underline{\hspace{2cm}}$   
 $m\widehat{ABC} = \underline{\hspace{2cm}}$

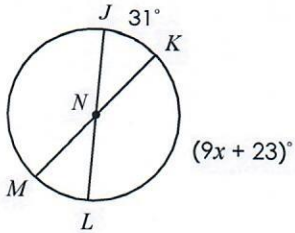
3.   $m\widehat{DE} = \underline{\hspace{2cm}}$   
 $m\widehat{FE} = \underline{\hspace{2cm}}$   
 $m\widehat{DEF} = \underline{\hspace{2cm}}$   
 $m\widehat{CFD} = \underline{\hspace{2cm}}$   
 $m\widehat{DFE} = \underline{\hspace{2cm}}$

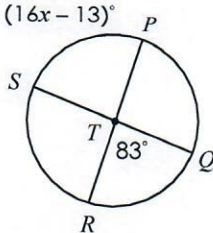
4.   $m\widehat{TQ} = \underline{\hspace{2cm}}$   
 $m\widehat{QR} = \underline{\hspace{2cm}}$   
 $m\widehat{TS} = \underline{\hspace{2cm}}$   
 $m\widehat{SQR} = \underline{\hspace{2cm}}$   
 $m\widehat{RQT} = \underline{\hspace{2cm}}$

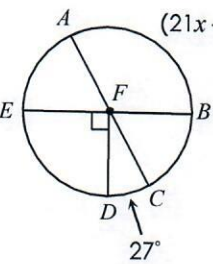
5.   $m\widehat{KL} = \underline{\hspace{2cm}}$   
 $m\widehat{LON} = \underline{\hspace{2cm}}$   
 $m\widehat{OM} = \underline{\hspace{2cm}}$   
 $m\widehat{KNL} = \underline{\hspace{2cm}}$   
 $m\widehat{NL} = \underline{\hspace{2cm}}$

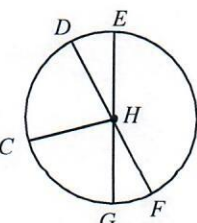
6.   $m\widehat{YU} = \underline{\hspace{2cm}}$   
 $m\widehat{XW} = \underline{\hspace{2cm}}$   
 $m\widehat{XVW} = \underline{\hspace{2cm}}$   
 $m\widehat{VW} = \underline{\hspace{2cm}}$   
 $m\widehat{YWU} = \underline{\hspace{2cm}}$

**Directions:** Find the value of  $x$ .

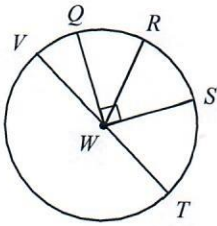
7.   $x = \underline{\hspace{2cm}}$

8.   $x = \underline{\hspace{2cm}}$

9.   $x = \underline{\hspace{2cm}}$

10. Given:  $\overline{CH}$  bisects  $\angle DHG$ ,  
 $m\widehat{GF} = (2x + 6)^\circ$ , and  $m\widehat{DC} = (7x - 1)^\circ$ .  
  $x = \underline{\hspace{2cm}}$

11. If  $m\widehat{VQ} = (y + 7)^\circ$ ,  $m\widehat{QR} = (x + 11)^\circ$ ,  $m\widehat{RS} = (3y)^\circ$ , and  $m\widehat{ST} = 65^\circ$ , find the values of  $x$  and  $y$ .

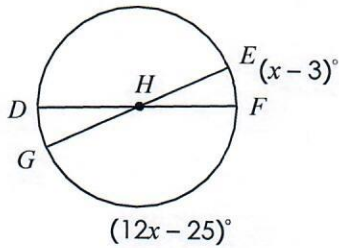


$$x = \underline{\hspace{2cm}}$$

$$y = \underline{\hspace{2cm}}$$

**Directions:** Find the value of  $x$  and each arc measure.

12.



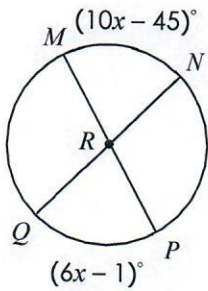
$$x = \underline{\hspace{2cm}}$$

$$m\widehat{DE} = \underline{\hspace{2cm}}$$

$$m\widehat{EF} = \underline{\hspace{2cm}}$$

$$m\widehat{DFG} = \underline{\hspace{2cm}}$$

13.



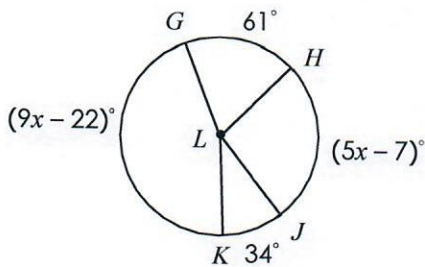
$$x = \underline{\hspace{2cm}}$$

$$m\widehat{MN} = \underline{\hspace{2cm}}$$

$$m\widehat{NP} = \underline{\hspace{2cm}}$$

$$m\widehat{NQP} = \underline{\hspace{2cm}}$$

14.



$$x = \underline{\hspace{2cm}}$$

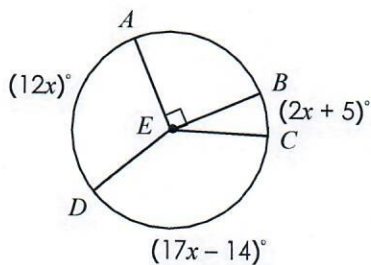
$$m\widehat{GK} = \underline{\hspace{2cm}}$$

$$m\widehat{HJ} = \underline{\hspace{2cm}}$$

$$m\widehat{HGJ} = \underline{\hspace{2cm}}$$

$$m\widehat{GKJ} = \underline{\hspace{2cm}}$$

15.



$$x = \underline{\hspace{2cm}}$$

$$m\widehat{AD} = \underline{\hspace{2cm}}$$

$$m\widehat{BC} = \underline{\hspace{2cm}}$$

$$m\widehat{DC} = \underline{\hspace{2cm}}$$

$$m\widehat{DBC} = \underline{\hspace{2cm}}$$