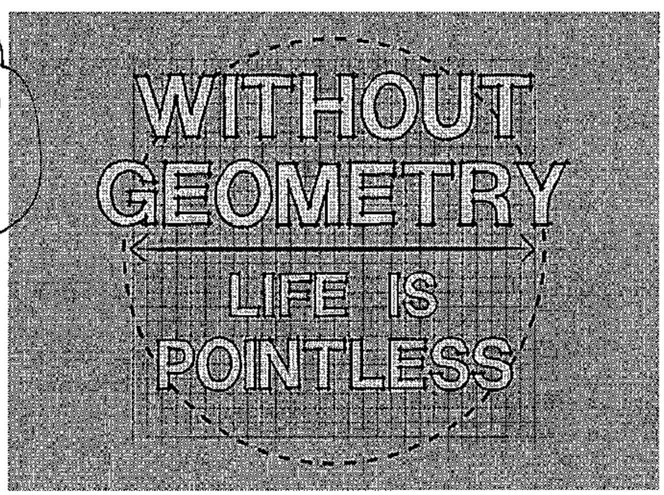
Math 3 – Fall 2017

Unit 6 – Geometry and Circles

Day	Date	Lesson	Assignment
1	~~12/11~~ 12/8	Tangent Lines of Circles Pages 1- 4	
2	~~12/12~~ 12/11	Radius, Chords, Angles and Arcs Pages 5-8	
3	~~12/13~~ 12/12	Inscribed Angles, Chords and Arcs Pages 9-11	
4	~~12/14~~ 12/13	Angle Measures and Segment Lengths Special Segments in a Circle Pages 12-14	
5	~~12/15~~ 12/14	Equations of Circles Pages 15- 18	
6	~~12/18~~ 12/15	Area of Sectors and Arc Lengths Pages 19-21	
7	~~12/19~~ 12/18	Review Pages 22-27	
8	~~12/20~~ 12/19	Test	

12/20 STEM
12/21 Project?



Review--Unit 8: Circles Name ______________________
Definitions and Theorems

I. Definitions:

- A **circle** is defined as the set of all points in a plane that are equidistant from a given fixed point called the center. (360 degrees)
- A **radius** is a segment from the center to the edge of a circle.
- A **diameter** is the longest chord which contains the center.
- A **chord** is a segment whose endpoints are on the circle.
- A **central angle** is an angle whose vertex is located at the center of the circle and whose sides are radii.
- An **arc** is an unbroken part of the circle.
- A **minor arc** is an arc that is less than half the circle.

  measure = central angle measure
- A **major arc** is an arc that is more than half the circle.

  measure = 360 – central angle measure
- A **semicircle** is an arc made by the diameter of the circle. (180 degrees)
- **Adjacent arcs** have exactly one point in common.
- **Concentric circles** are circles that share the same center but have different radii.
- An **inscribed angle** has its vertex on the circle and its sides are chords of the circle.
- An **inscribe polygon** is a polygon where each vertex is on the circle.
- A **secant line** is a line that intersects a circle in two points.
- A **tangent line** is a line that intersects a circle in one point.
- The **point of tangency** is the point on the circle where the tangent intersects it.
- **Common external tangents** are tangents outside of two circles that do not intersect.
- **Common internal tangents** are tangents that intersect between two circles.
- A **circumscribed polygon** is a polygon where each side of the polygon is tangent to the circle.

II. Theorems:

- In a circle, if the diameter of the circle is perpendicular to a chord, then the diameter bisects the chord and it arc.
- Minor arcs are congruent if and only if their corresponding chords are congruent.
- In the same circle, or in congruent circles, two chords are congruent if and only if they are equidistant from the center.
- The measure of an inscribed angle is half the measure of the intercepted arc.
- If two inscribed angles of a circle or congruent circles intercept congruent arcs (or the same arc) then the angles are congruent.

Review--Unit 8: Circles Name ____________________

Definitions and Theorems

- If an inscribed angle of a circle intercepts a semicircle, then the angle is a right angle.
- If a quadrilateral is inscribed in a circle, then its opposite angles are supplementary.
- In a plane, if a line is perpendicular to a radius of a circle at the endpoint on the circle, then the line is a tangent of the circle.
- If two segments from the same exterior point are tangent to a circle, then they are congruent.
- If a secant and a tangent intersect at the point of tangency, then the measure of each angle formed is ½ the measure of its intercepted arc.
- If 2 secants intersect in the interior of a circle, then the measure of an angle formed is 1/2 the sum of the measures of the arcs intercepted by the angle and its vertical angles.
- If 2 secants, a secant and a tangent, or 2 tangents intersect in the exterior of a circle, then the measure of the angle formed is 1/2 the positive differences of the measures of the intercepted arcs.
- If 2 chords intersect in a circle, then the products of the measures of the segments of the chords are equal.
- Two secants drawn to a circle from an exterior point, the product of the measures of one secant and its external secant segment is equal to the product of the measures of the other secant and its external secant segment.

III. Example Problems

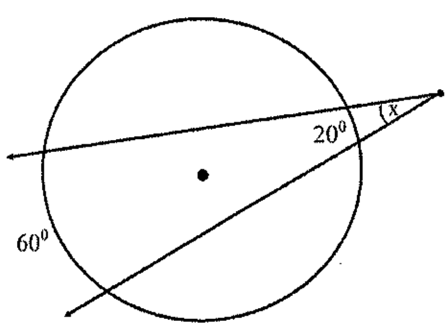
1. Suppose a chord of a circle is 16cm long and is 12 cm from the center of the circle. Find the radius.

Radius= ________

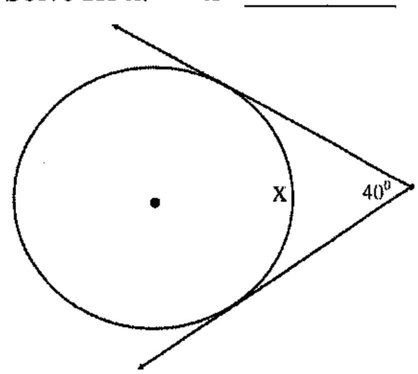
2. Suppose the diameter of a circle is 20 cm long, and a chord is 18 cm long. Find the distance between the chord and the center of the circle.

Distance= ________

3. Solve for x. x= __________



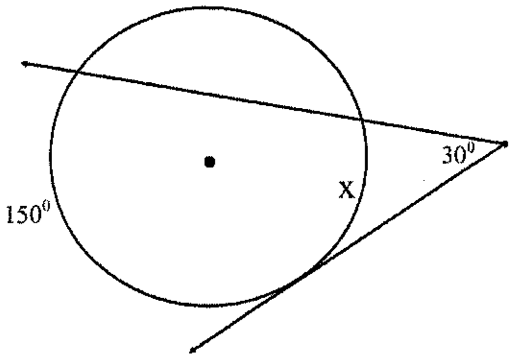
4. Solve for x. x= __________



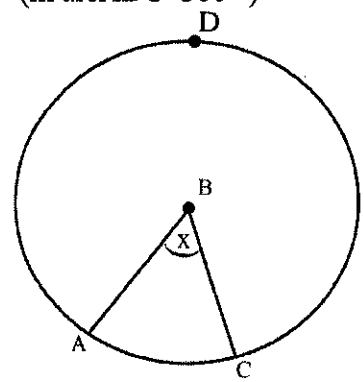
Review--Unit 8: Circles
Definitions and Theorems

Name ____________________

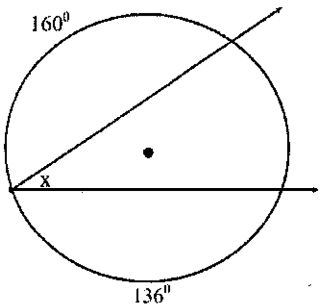
5. Solve for x. x= __________



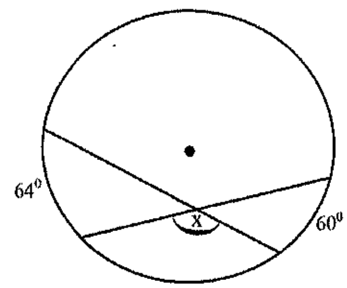
6. Solve for x. x= __________
(m arc$\overset{\frown}{ADC}$=300°)



7. Solve for x. x= __________



8. Solve for x. x= __________



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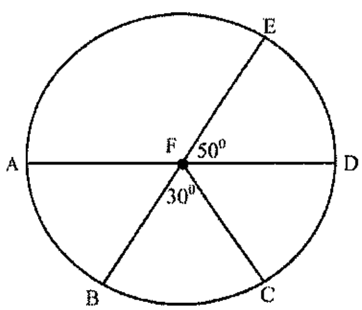
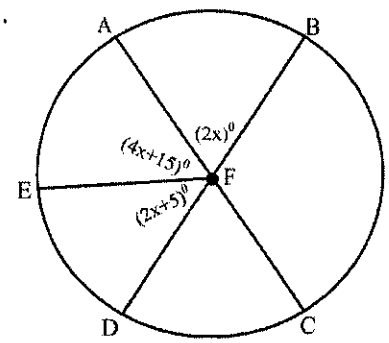


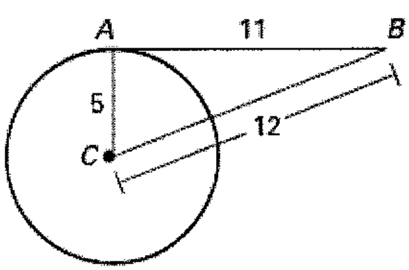
m arc$\overset{\frown}{DEC}$= __________
m arc $\overset{\frown}{AE}$= __________

10.



m arc$\overset{\frown}{CB}$= __________
m arc $\overset{\frown}{ACE}$= __________

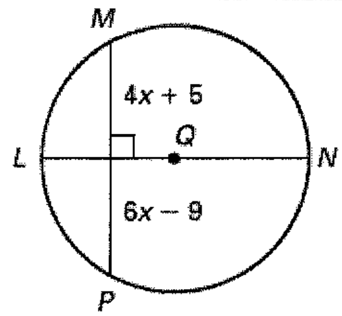
11. Determine whether $\overline{AB}$ is tangent to ⊙ *C*. *Explain* your reasoning.



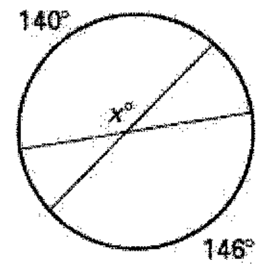
Review--Unit 8: Circles
Definitions and Theorems

Name ______________________

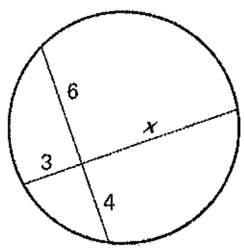
12. Solve for x. x = __________



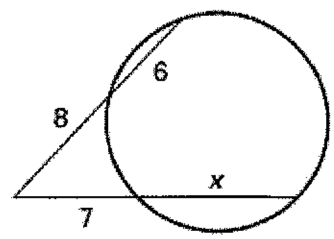
13. Solve for x. x = __________



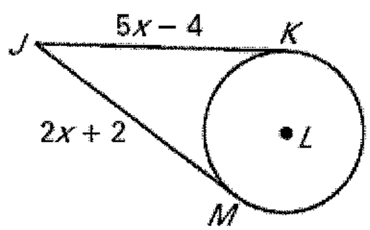
14. 6 • _____ = 3 • _____



15. Solve for x. x = __________

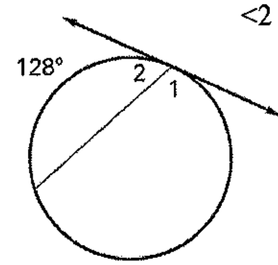


16. Solve for x. x = __________

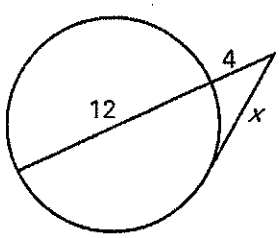


17. Find angles 1 and 2. <1 = _______

<2 = _______



18. $x^2 = 4 \bullet$ _____



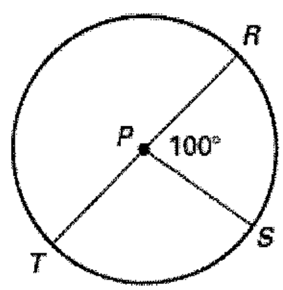
Find the measure of each arc of ⊙ *P*, where $\overline{RT}$ is a diameter.

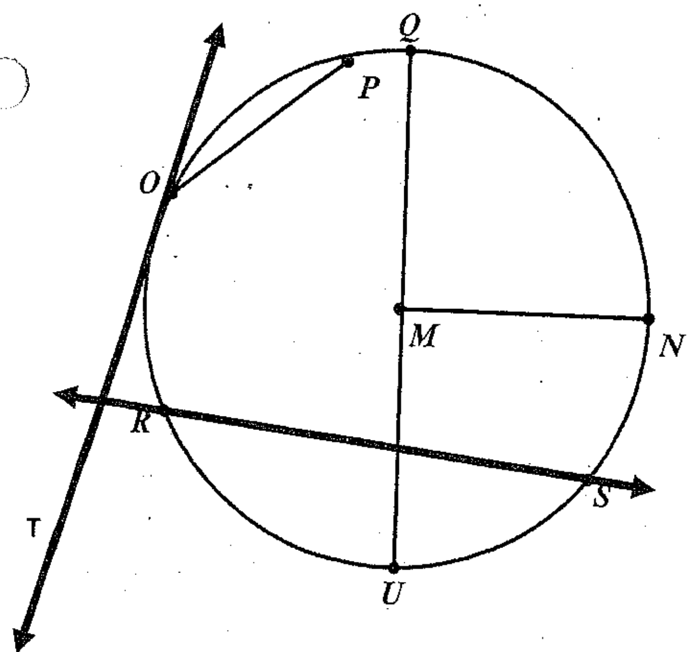
19. $m\,\overset{\frown}{RS}$

20. $m\,\overset{\frown}{ST}$

21. $m\,\overset{\frown}{RTS}$

22. $m\,\overset{\frown}{RST}$

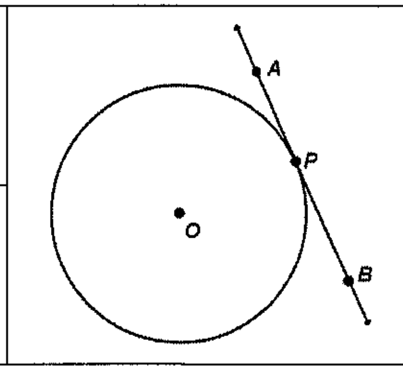




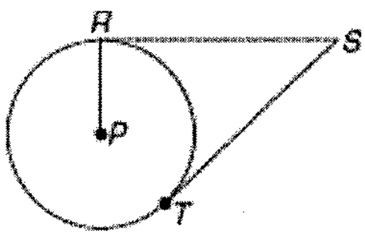
Term	Definition	Name
Circle	*	
Chord		
Radius		
Diameter		
Secant		
Tangent		
Arc		
Minor arc	Use 2 letters to name	
Major Arc	Use 3 letters to name	
Semicircle		

6.7 Tangent Lines of Circles

SWBAT solve for unknown variables using theorems about tangent lines of circles.

Tangent to a Circle Ex: (AB)	A line in the plane of the circle that intersects the circle in exactly one point. ***Ex:*** *Segment AB is a tangent to Circle O.*	
Point of Tangency	The point where a circle and a tangent intersect. ***Ex:*** *Point P is a point of tangency on Circle O.*	

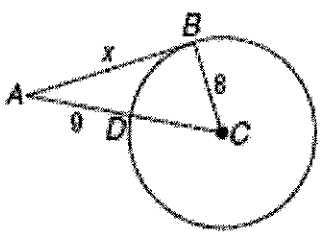
Tangent Theorem 1:	Converse Theorem 1:
If a line is tangent to a circle, then it is perpendicular to the radius draw to the point of tangency.	If a line is perpendicular to the radius of a circle at its endpoint on a circle, then the line is tangent to the circle.



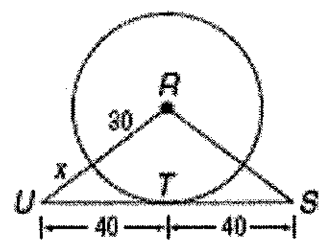
Example: If RS is tangent, then PR _____ RS.

Example 1: Find the measure of x.

a)

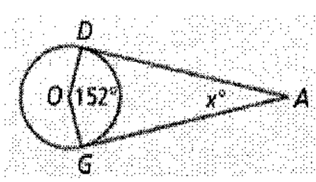


b)

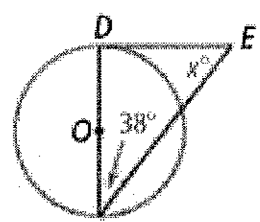


Example 2: Find x. *All segments that appear tangent are tangent to Circle O.*

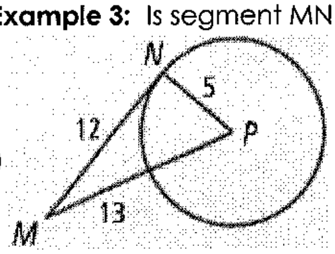
a)



b)

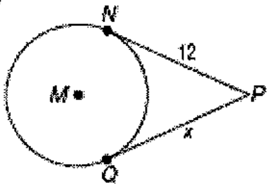


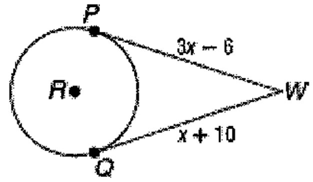
Example 3: Is segment MN tangent to Circle O at P? Explain.

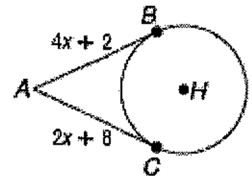


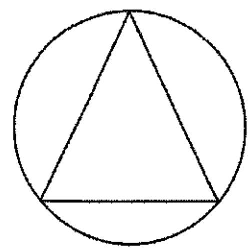
Tangent Theorem 2: *If two tangent segments to a circle share a common endpoint outside the circle, then the two segments are congruent.*

Example 4: Solve for x.

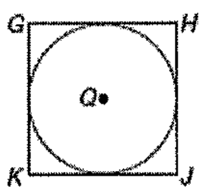


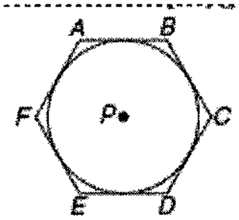




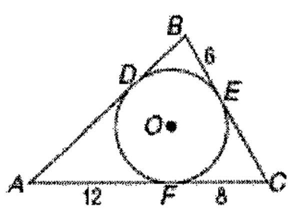
Circumscribed vs. Inscribed		
To ***circumscribe*** is when you draw a figure around another, touching it at points as possible.	To ***inscribe*** is to draw a figure within another so that the inner figure lies entirely within the boundary of the outer.	
Ex: *The circle is circumscribed about the triangle.*	***Ex:*** *The triangle is inscribed in the circle.*	

Tangent Theorem 3: (Circumscribed Polygons) *When a polygon is circumscribed about a circle, all of the sides of the polygon are tangent to the circle.*



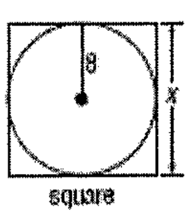


Example 5: Triangle ABC is circumscribed about ⊙O. Find the perimeter of triangle ABC.

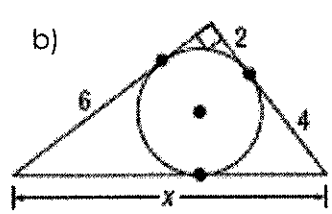


You Try! Find x. Assume that segments that appear to be tangent are tangent.

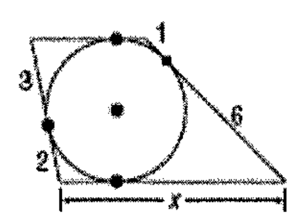
a)



b)



c)



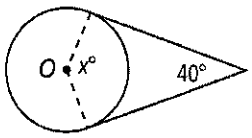
Practice 6.7: Tangents of Circles

Name: ______________________

Math 3

Directions: Assume that lines that appear to be tangent are tangent. *O* is the center of each circle. What is the value of *x*?

1.



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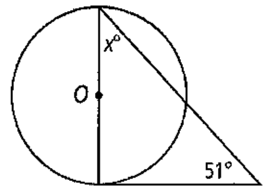

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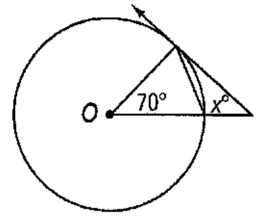
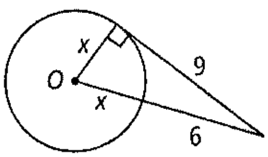


Directions: In each circle, what is the value of x to the nearest tenth?

4.



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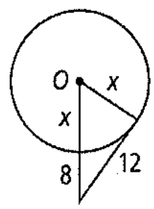

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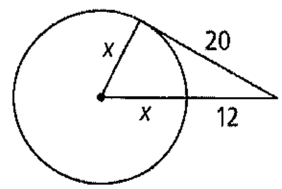
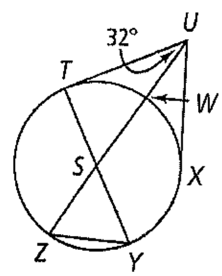
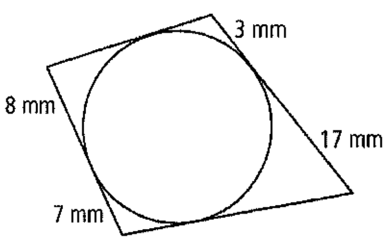


7. $\overline{TY}$ and $\overline{ZW}$ are diameters of $\odot S$. $\overline{TU}$ and $\overline{UX}$ are tangents of $\odot S$. What is $m\angle SYZ$?



Directions: Each polygon circumscribes a circle. What is the perimeter of each polygon?

8.



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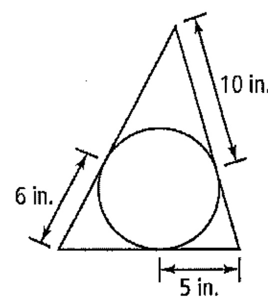

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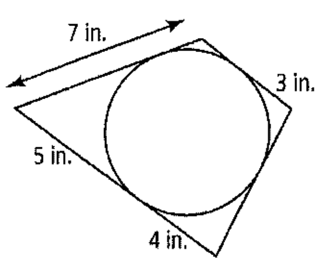

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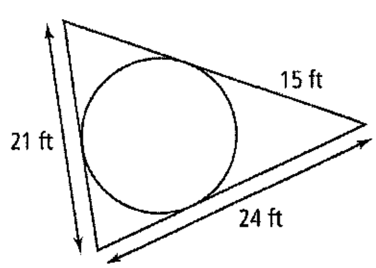


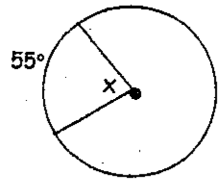
Circle Unit

Measures of angles:

Name______________________

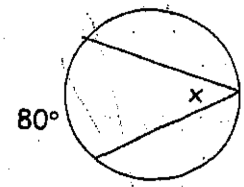
1) Central Angle = to its intercepted arc

x = ______



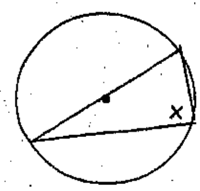
2) Inscribed Angle = $\frac{1}{2}$ its intercepted arc

x = ________



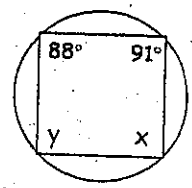
3) An inscribed angle in a semicircle = ______°.

x = ______



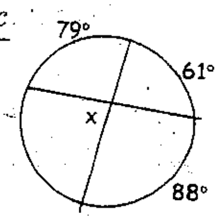
4) Opposite angles of an inscribed quadrilateral are ______________.

x = ______ y = ______



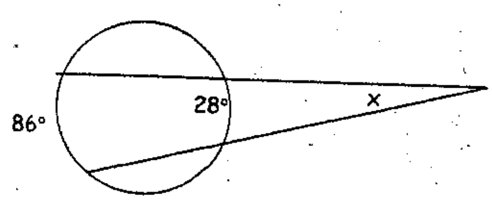
5) Angle formed by two chords intersecting in the **interior** of a circle = $\frac{arc + arc}{2}$

x = ______



6) Angle formed by two secant segments in the **exterior** of the circle = $\frac{outer\ arc - inner\ arc}{2}$

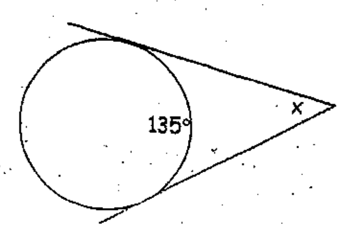
x = ______



{Cone Head}

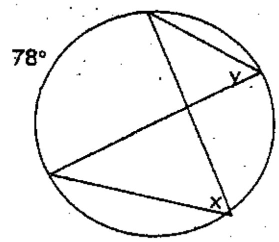
7) Angle formed by two tangents intersecting in the **exterior** of the circle = $180 - inner\ arc$

x = ________

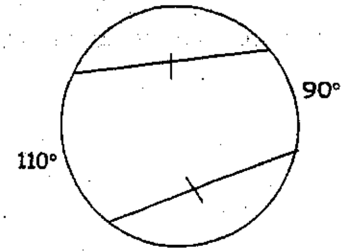


8) Angles inscribed in the same arc or intercepting congruent arcs are ________________.

x = ______ y = ______



9) Congruent chords have congruent __________.

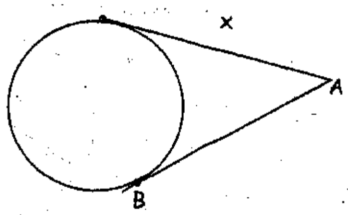


x = _____

{Cone Head}

Two tangent segments from an external point to a circle are ______________.

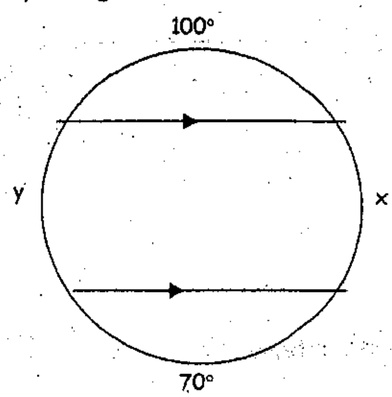
If AB = 17, x = ______



10) In a circle, parallel chords intercept congruent __________.

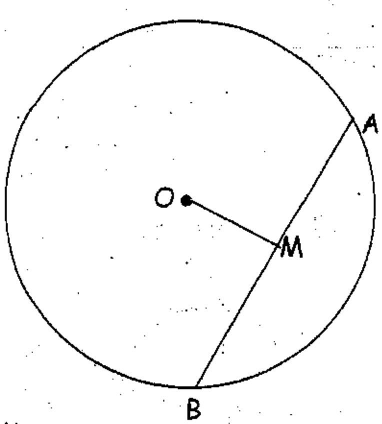
x = _____

y = _____



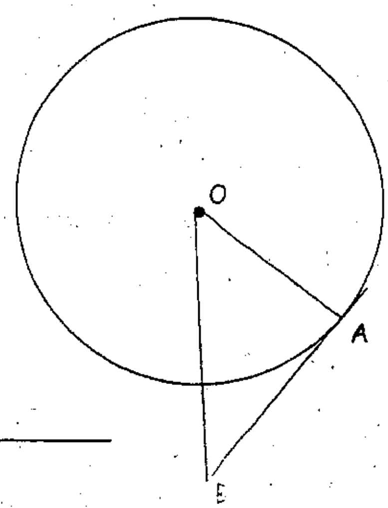
Triple Theorems: if any 2 of the following are true, the third statement is also true.

11) a) line through the **center** of a circle
b) line **perpendicular** to a chord
c) line **bisecting** the chord



Conclusion: __________________

12) a) line contains the **center** of a circle
b) line **tangent** to the circle
c) line **perpendicular** to a radius at point of tangency



Conclusion: ____________

6

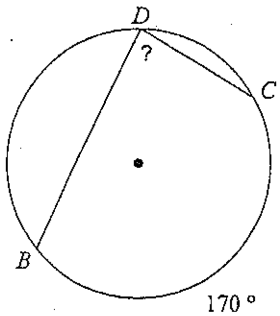
Name____________________ ID: 1

Arcs and Angles of Circles

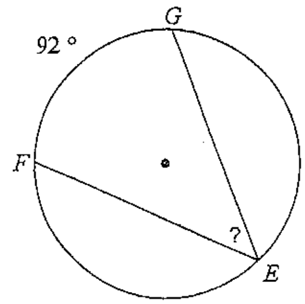
Date________________ Period____

Find the measure of the arc or angle indicated.

1)

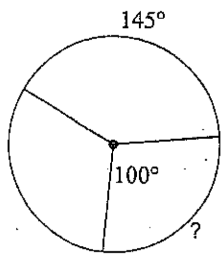


2)

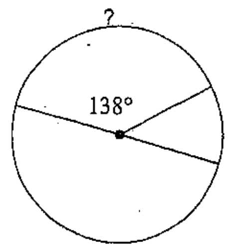


Find the measure of the arc or central angle indicated. Assume that lines which appear to be diameters are actual diameters.

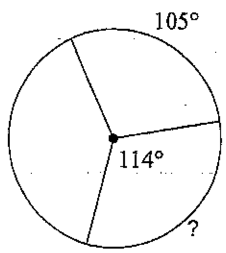
3)



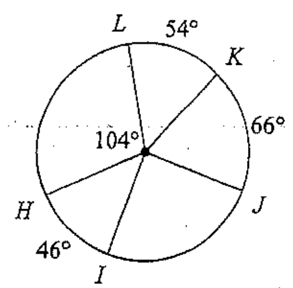
4)



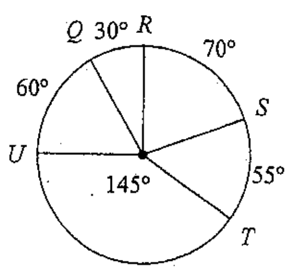
5)



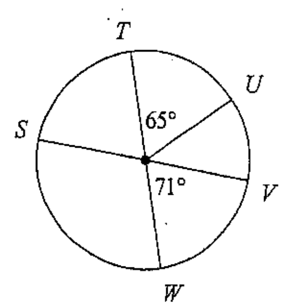
6) $m\overset{\frown}{JH}$



7) $m\overset{\frown}{URT}$

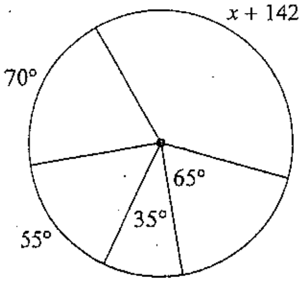


8) $m\overset{\frown}{SU}$



Solve for x. Assume that lines which appear to be diameters are actual diameters.

9)



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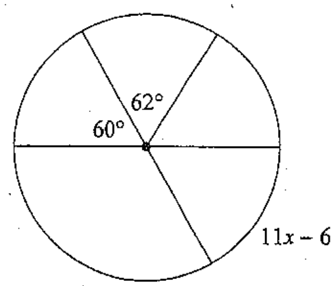
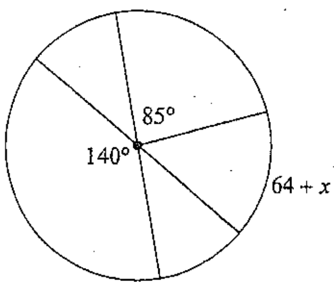
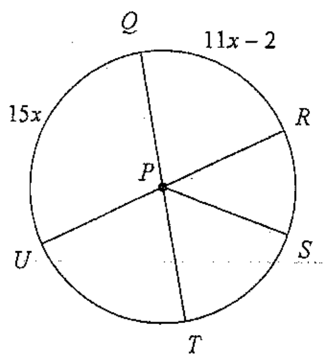


11)

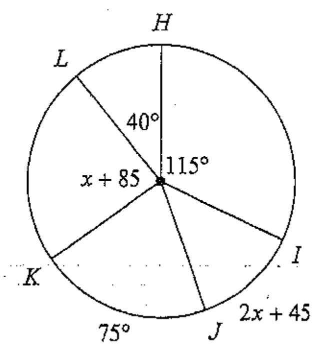


Find the measure of the arc or central angle indicated. Assume that lines which appear to be diameters are actual diameters.

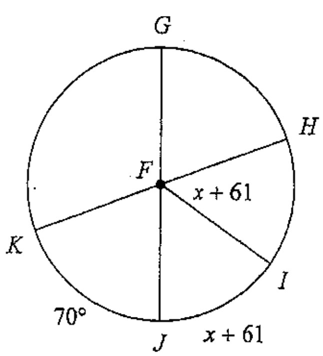
12) $m\angle QPR$



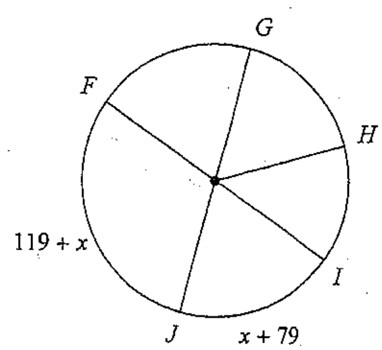
13) $m\widehat{IJ}$



14) $m\angle GFH$



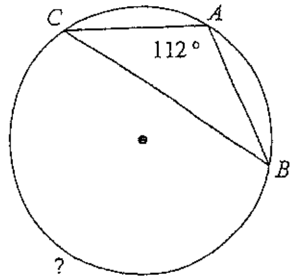
15) $m\widehat{JF}$



8

Find the measure of the arc or angle indicated.

1)



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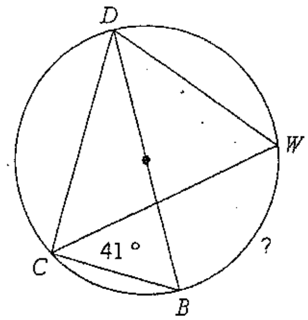
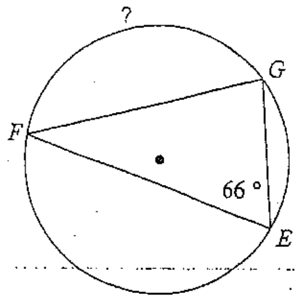


3)



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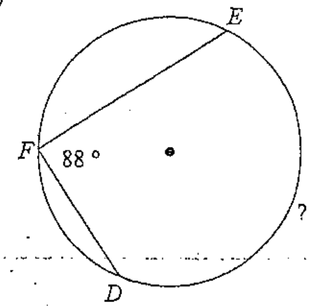

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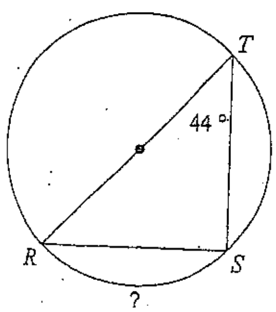

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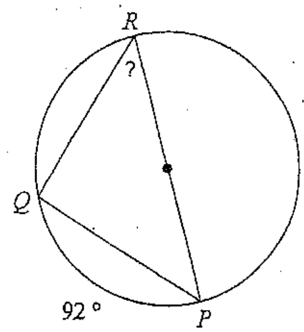
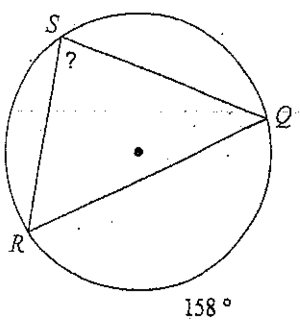


7)



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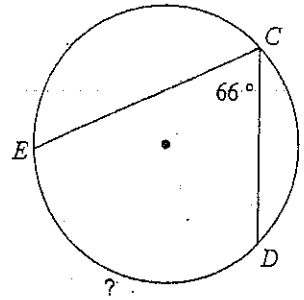

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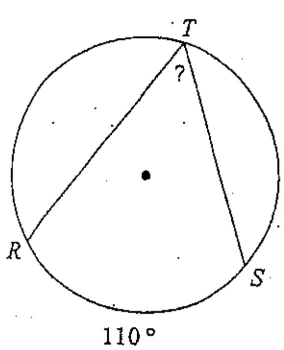
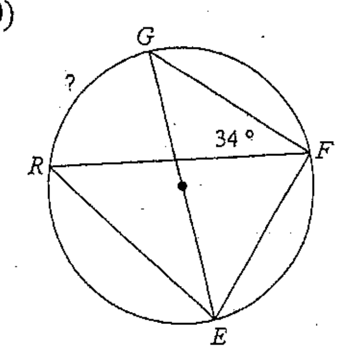
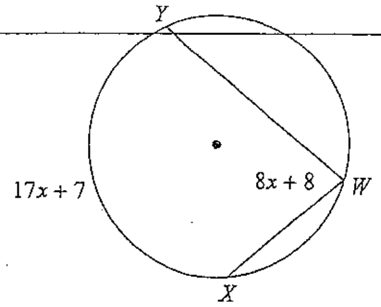


10)





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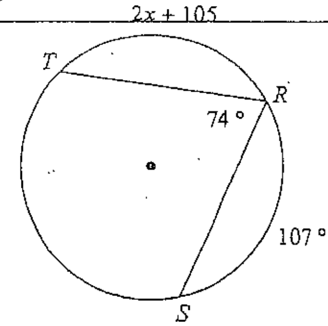
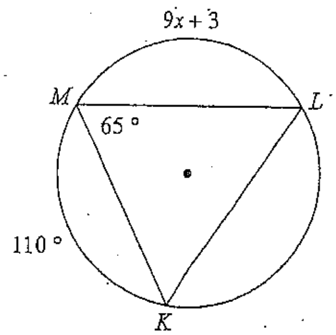
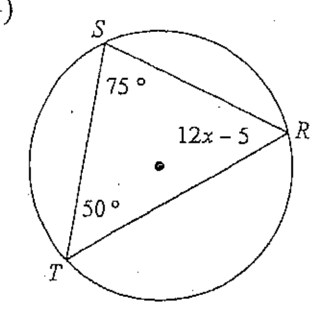


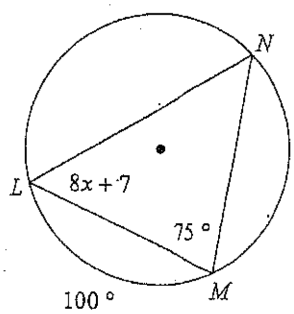
23)



24)



25)



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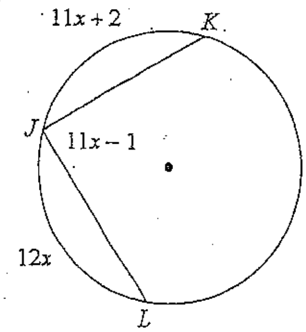

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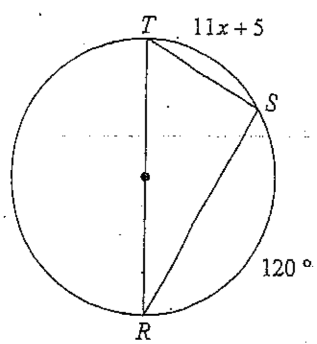

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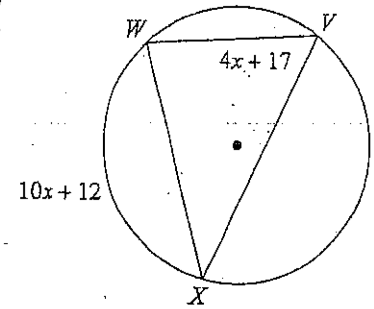
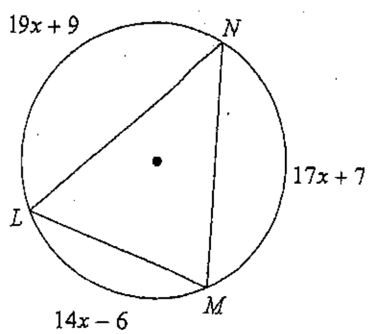
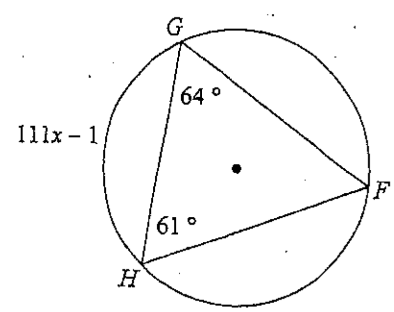


29)



30)



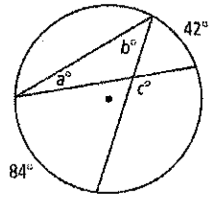
10

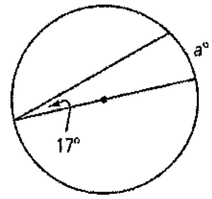
Homework 6.9: Inscribed Angles

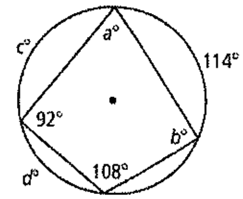
Name: ______________________

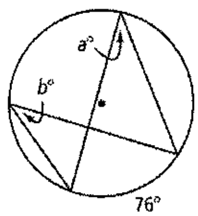
Math 3

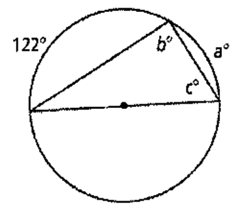
Directions: Find the value of each variable. For each circle, the dot represents the center.

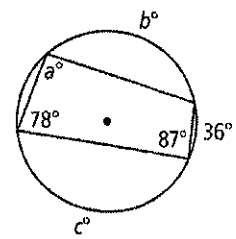
1. 

2. 

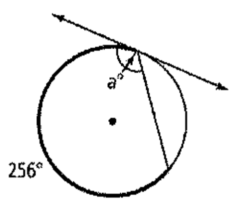
3. 

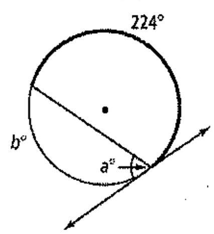
4. 

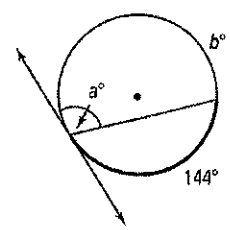
5. 

6. 

Directions: Find the value of each variable. Lines that appear to be tangent are tangent.

7. 

8. 

9. 

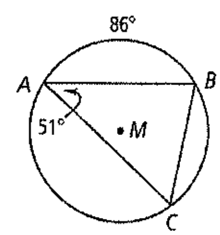
Directions: Find each indicated measure for ⊙M.

10. $m\angle B$

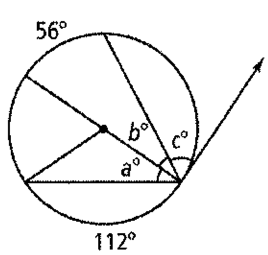
11. $m\angle C$

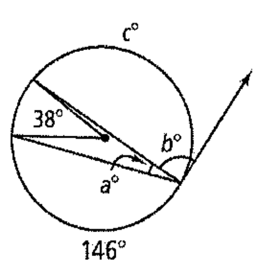
12. $m\overset{\frown}{BC}$

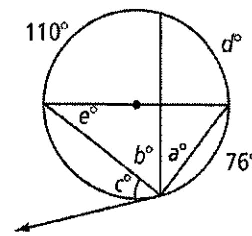
13. $m\overset{\frown}{AC}$



Directions: Find the value of each variable. For each circle, the dot represents the center.

14. 

15. 

16. 

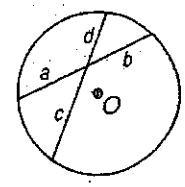
11

NAME ____________________ DATE __________ PERIOD _____

Study Guide and Intervention

Special Segments in a Circle

Segments Intersecting Inside a Circle If two chords intersect in a circle, then the products of the measures of the chords are equal.



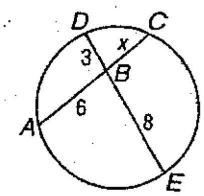
$a \cdot b = c \cdot d$

Example **Find x.**

The two chords intersect inside the circle, so the products $AB \cdot BC$ and $EB \cdot BD$ are equal.

$AB \cdot BC = EB \cdot BD$

$6 \cdot x = 8 \cdot 3$	Substitution
$6x = 24$	Simplify.
$x = 4$	Divide each side by 6.

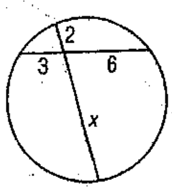


$AB \cdot BC = EB \cdot BD$

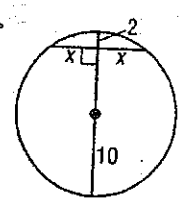
Exercises

Find x to the nearest tenth.

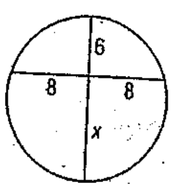
1.



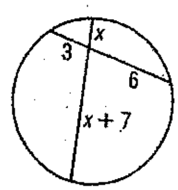
2.



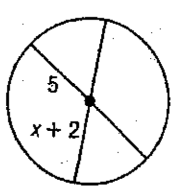
3.



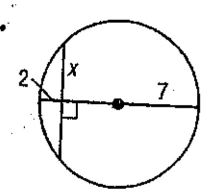
4.



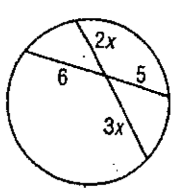
5.



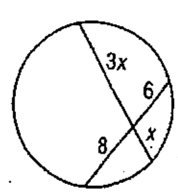
6.



7.



8.



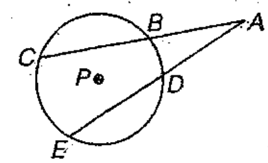
NAME ______________________ DATE __________ PERIOD _____

9-7 Study Guide and Intervention *(continued)*

Special Segments in a Circle

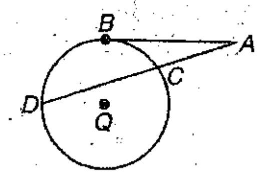
Segments Intersecting Outside a Circle If secants and tangents intersect outside a circle, then two products are equal.

- If two secant segments are drawn to a circle from an exterior point, then the product of the measures of one secant segment and its external secant segment is equal to the product of the measures of the other secant segment and its external secant segment.



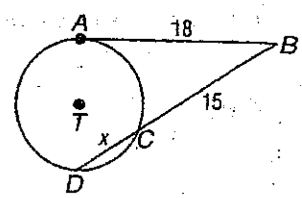
$\overline{AC}$ and $\overline{AE}$ are secant segments.
$\overline{AB}$ and $\overline{AD}$ are external secant segments.
$AC \cdot AB = AE \cdot AD$

- If a tangent segment and a secant segment are drawn to a circle from an exterior point, then the square of the measure of the tangent segment is equal to the product of the measures of the secant segment and its external secant segment.



$\overline{AB}$ is a tangent segment.
$\overline{AD}$ is a secant segment.
$\overline{AC}$ is an external secant segment.
$(AB)^2 = AD \cdot AC$

Example **Find x to the nearest tenth.**

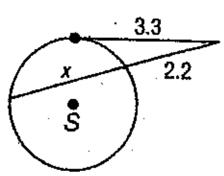


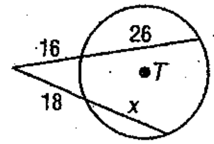
The tangent segment is $\overline{AB}$, the secant segment is $\overline{BD}$, and the external secant segment is $\overline{BC}$.

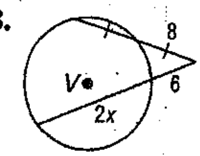
$(AB)^2 = BC \cdot BD$
$(18)^2 = 15(15 + x)$
$324 = 225 + 15x$
$99 = 15x$
$6.6 = x$

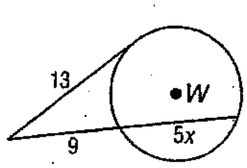
Exercises

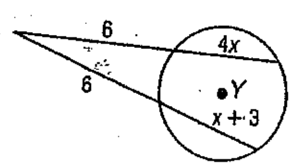
Find x to the nearest tenth. Assume segments that appear to be tangent are tangent.

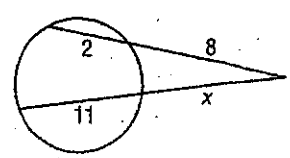
1.


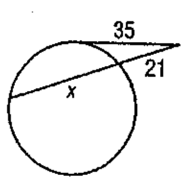
2.


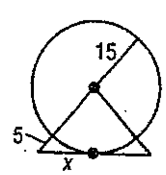
3.


4.


5.


6.


7.


8.


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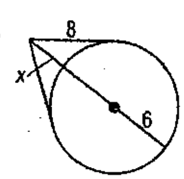


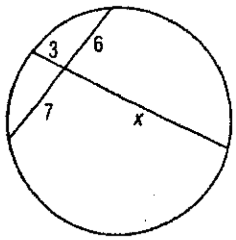
NAME ______________________________ DATE ____________ PERIOD _____

Skills Practice

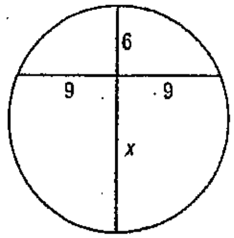
Special Segments in a Circle

Find x to the nearest tenth. Assume that segments that appear to be tangent are tangent.

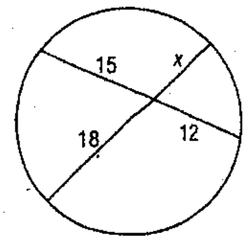
1.



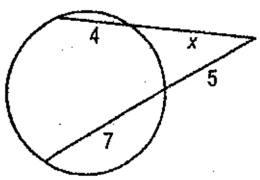
2.



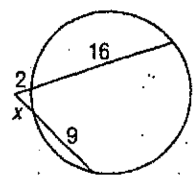
3.



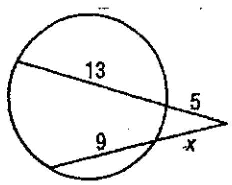
4.



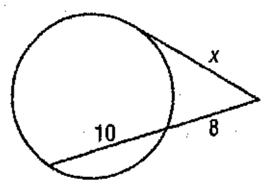
5.



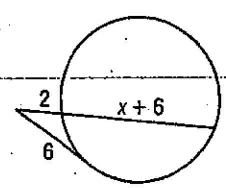
6.



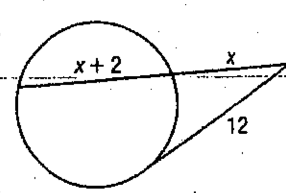
7.



8.

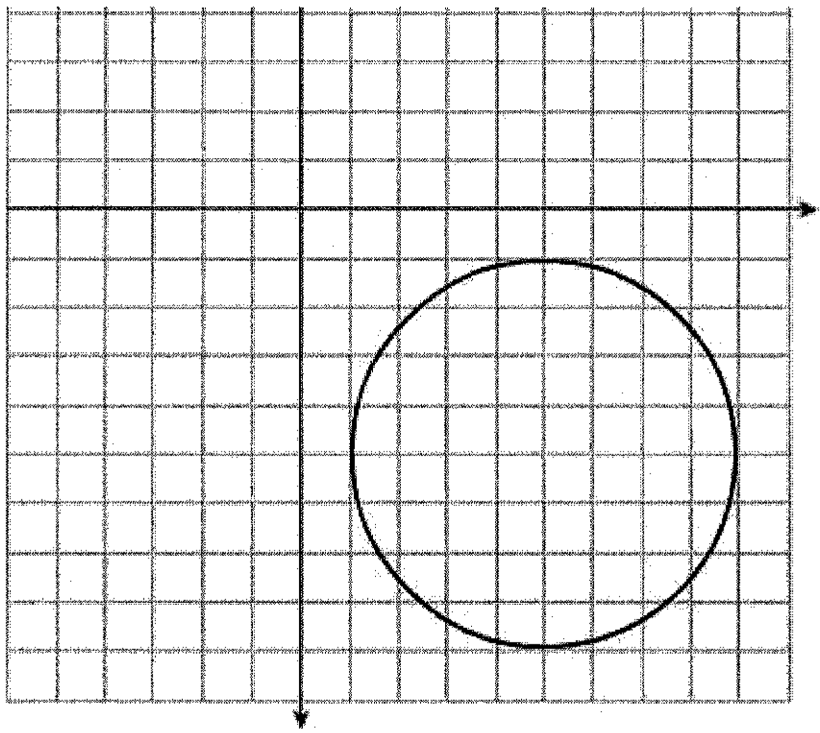


9.



EQUATIONS OF CIRCLES

Model Problem 2
What is the equation of the circle below?



Model Problem 3 and 4

Identify the coordinates of the center and the length of the radius in the circles below

$(X - 5)^2 + (y + 2)^2 = 4$ **radius:** **Center: (___, _____)**

$(X + 2)^2 + (y - 1)^2 = 9$ **radius:** **Center: (___, _____)**

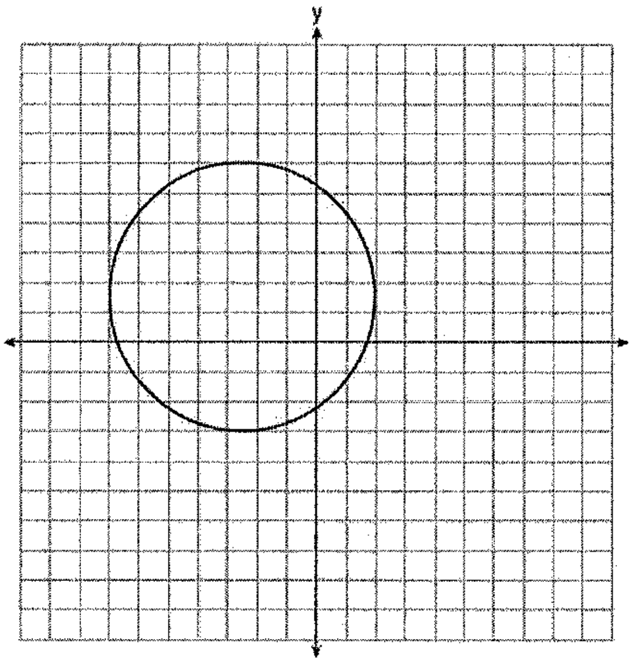
Part I
Identify the coordinates of the center and the length of the radius in the circles below.

1) $(X - 1)^2 + (y - 3)^2 = 9$ **radius:** **Center: (___, _____)**

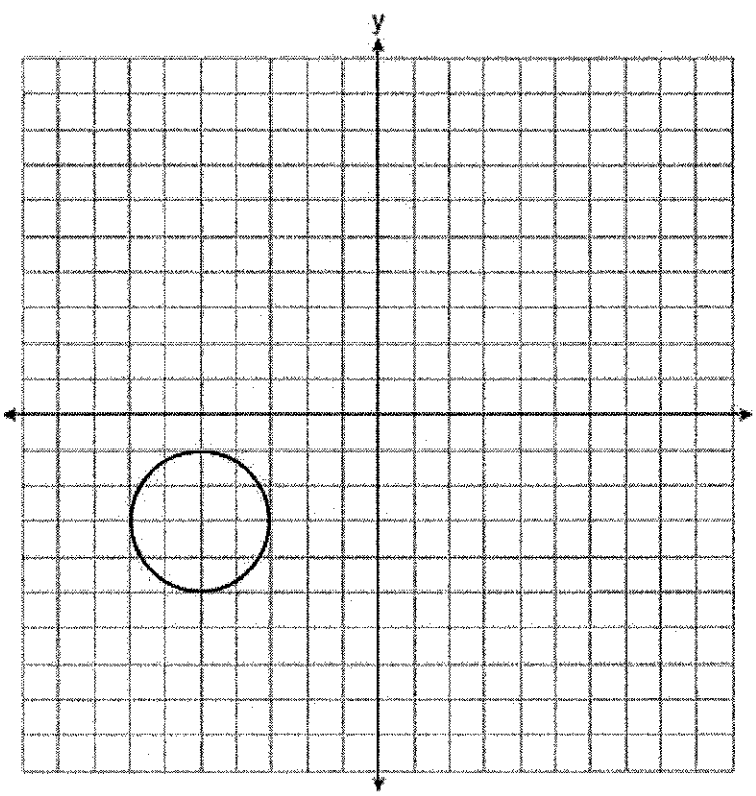
2) $(X + 14)^2 + (y - 5)^2 = 16$ **radius:** **Center: (___, _____)**

3) $(X - 5)^2 + (y - 1)^2 = 25$ **radius:** **Center: (___, _____)**

4) What is the equation of the circle pictured below



5) What is the equation of the circle pictured below



NAME ______________________________ DATE ____________ PERIOD _____

9-8 Skills Practice

Equations of Circles

Write an equation for each circle.

1. center at origin, $r = 6$

2. center at $(0, 0)$, $r = 2$

3. center at $(4, 3)$, $r = 9$

4. center at $(7, 1)$, $d = 24$

5. center at $(-5, 2)$, $r = 4$

6. center at $(6, -8)$, $d = 10$

7. a circle with center at $(8, 4)$ and a radius with endpoint $(0, 4)$

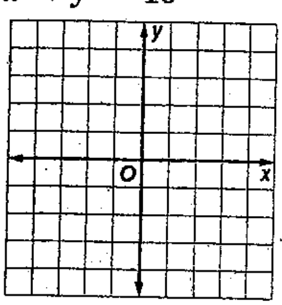
8. a circle with center at $(-2, -7)$ and a radius with endpoint $(0, 7)$

9. a circle with center at $(-3, 9)$ and a radius with endpoint $(1, 9)$

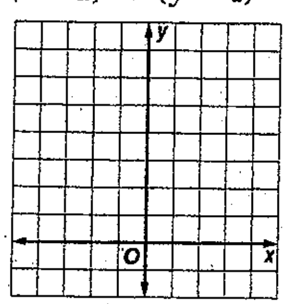
10. a circle whose diameter has endpoints $(-3, 0)$ and $(3, 0)$

Graph each equation.

11. $x^2 + y^2 = 16$



12. $(x - 1)^2 + (y - 4)^2 = 9$



(17)

Homework 6.10: Equations of Circles

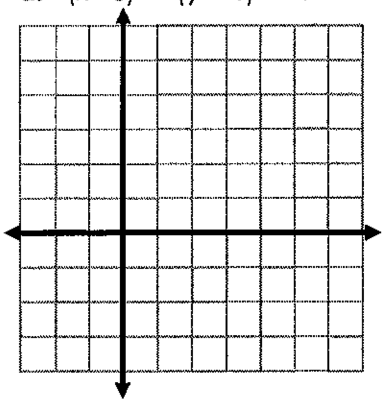
Name: ____________________

Math 3

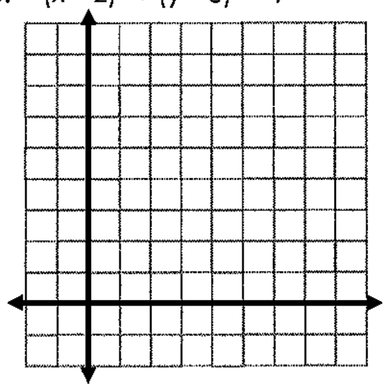
Note: If r^2 is not a perfect square then leave r in simplified radical form but use the decimal equivalent for graphing. Example: $\sqrt{12} = 2\sqrt{3} = 3.46$

1) **Graph the following circle:**

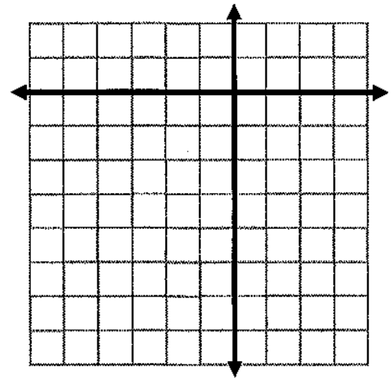
a. $(x - 3)^2 + (y + 1)^2 = 4$



b. $(x - 2)^2 + (y - 5)^2 = 9$



c. $(y + 4)^2 + (x + 2)^2 = 16$



2) **For each circle, identify its center and radius.**

a. $(x + 3)^2 + (y - 1)^2 = 4$

Center:__________

Radius:__________

b. b. $x^2 + (y - 3)^2 = 18$

Center:__________

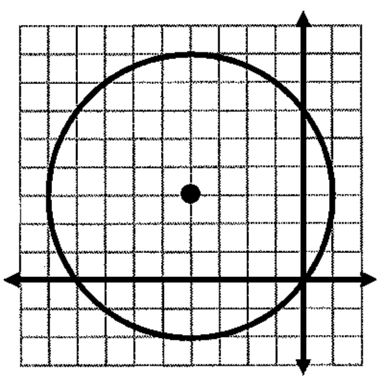
Radius:__________

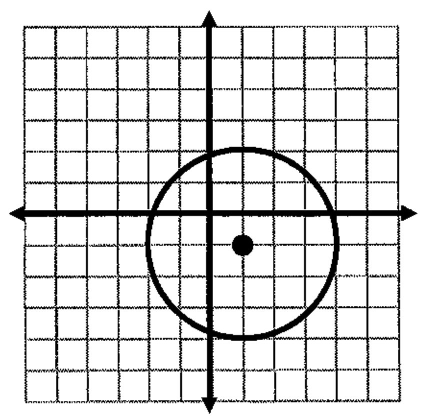
c. $(y + 8)^2 + (x + 2)^2 = 72$

Center:__________

Radius:__________

3) **<u>Write the equation of the following circles:</u>**





4) Give the equation of the circle that is tangent to the y-axis and center is (-3, 2).

5) **<u>Compare and contrast the following pairs of circles</u>**

a. <u>Circle #1:</u> $(x - 3)^2 + (y + 1)^2 = 25$

<u>Circle #2</u>: $(x + 1)^2 + (y - 2)^2 = 25$

b. <u>Circle #1:</u> $(y + 4)^2 + (x + 7)^2 = 6$

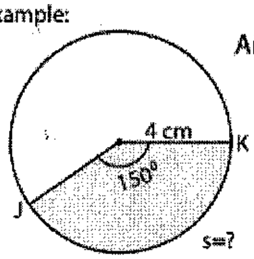
<u>Circle #2</u>: $(x + 7)^2 + (y + 4)^2 = 36$

Practice: Arc Length & Area of Sectors

Name: ____________________

Math 3

Example:



Arc length of a sector (s) = $\frac{\theta \times \pi \times r}{180^\circ}$

$= \frac{150^\circ \times 3.14 \times 4}{180^\circ}$

$= 10.47$ cm

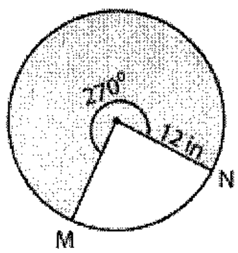
Area = $\frac{\theta \pi r^2}{360}$

$= \frac{150 \cdot 3.14 \cdot 4^2}{360}$

$= 20.94\ cm^2$

Find the length of the arc and area of the shaded region. Round the answer to two decimal places. (use $\pi = 3.14$)

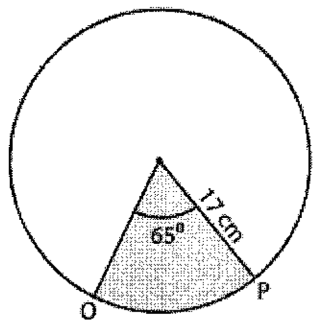
1)



Length of the arc MN = ____________

Area of a sector = ____________

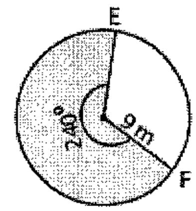
2)



Length of the arc OP = ____________

Area of a sector = ____________

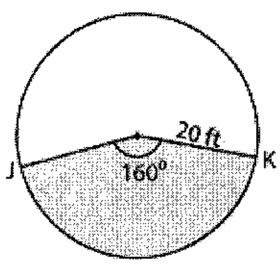
3)



Length of the arc EF = ____________

Area of a sector = ____________

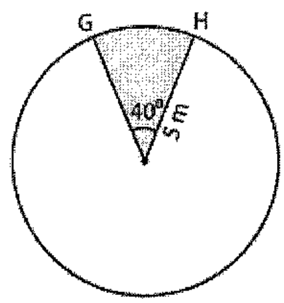
4)



Length of the arc JK = ____________

Area of a sector = ____________

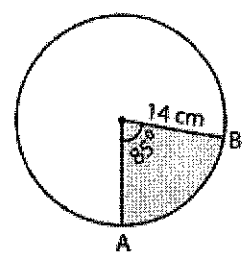
5)



Length of the arc GH = ____________

Area of a sector = ____________

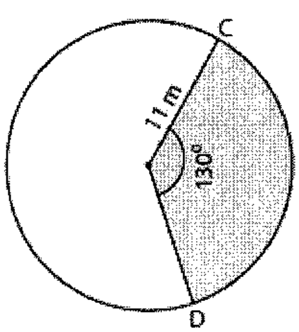
6)



Length of the arc AB = ____________

Area of a sector = ____________

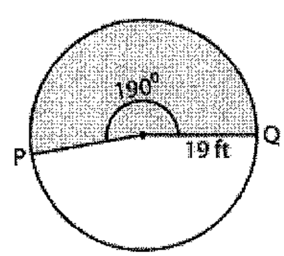
7)



Length of the arc CD = ____________

Area of a sector = ____________

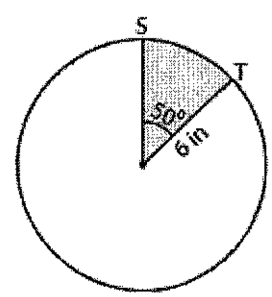
8)



Length of the arc PQ = ____________

Area of a sector = ____________

9)

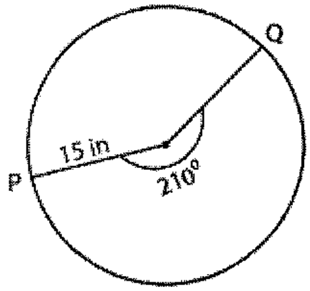


Length of the arc ST = ____________

Area of a sector = ____________

Find the missing one. Round the radius and central angle to the nearest whole number.
Round the arc length to two decimal places. (use $\pi = 3.14$)

1)

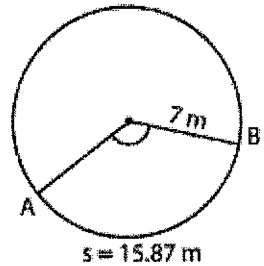


Radius = __________

Central angle = __________

Length of the arc PQ = __________

2)

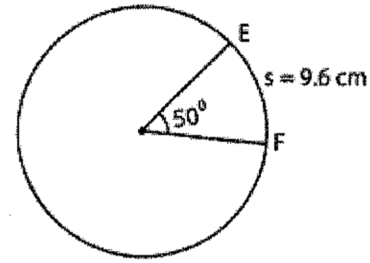


Radius = __________

Central angle = __________

Length of the arc AB = __________

3)



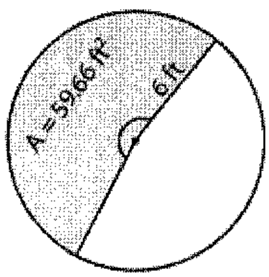
Radius = __________

Central angle = __________

Length of the arc EF = __________

Find the missing one. Round the radius and central angle to the nearest whole number.
Round the area to two decimal places. (use $\pi = 3.14$)

1)

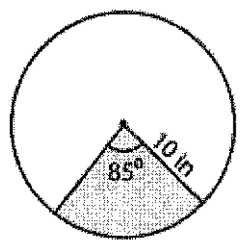


Radius = __________

Central angle = __________

Area of a sector = __________

2)

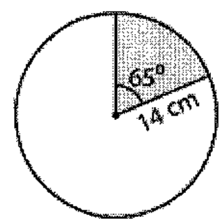


Radius = __________

Central angle = __________

Area of a sector = __________

3)



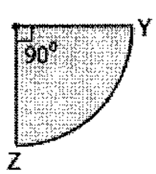
Radius = __________

Central angle = __________

Area of a sector = __________

Find the arc length for each sector. Round the answer to two decimal places. (use π=3.14)

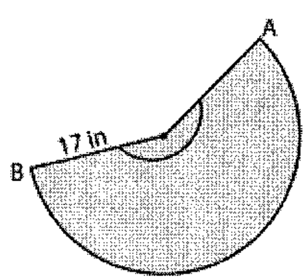
1)



Area = 153.86 cm^2

Length of the arc YZ = __________

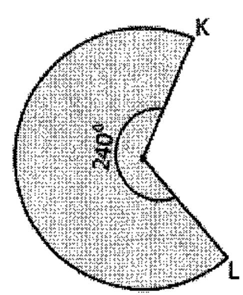
2)



Area = 529.35 in^2

Length of the arc AB = __________

3)



Area = 52.33 m^2

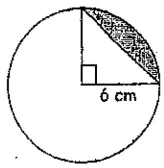
Length of the arc KL = __________

Honors CC3

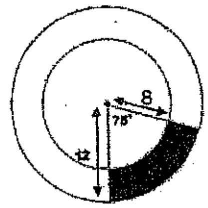
Areas of Circles and Arc Length

Ex4: Find the area of the shaded region. Give answers in exact form unless otherwise stated.

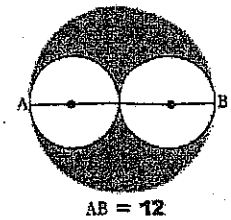
a.



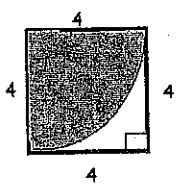
b.



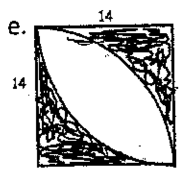
c.



d.



e.

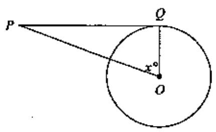


(round to the nearest tenth)

Common Core Unit 8 Test Review

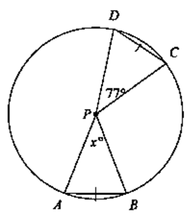
Multiple Choice: *Identify the choice that best completes the statement or answers the question.*

____ 1. Assume that lines that appear to be tangent are tangent. O is the center of the circle. Find the value of x if $m\angle P = 12$. (figures are not drawn to scale.)



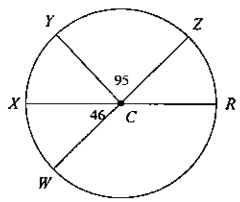
a. 78 b. 39 c. 102 d. 24

____ 2. Find the value of x. If necessary, round your answer to the nearest tenth. The figure is not drawn to scale.



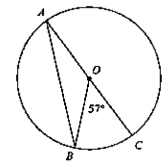
a. 13 b. 26 c. 77 d. 38.5

____ 3. $\overline{WZ}$ and $\overline{XR}$ are diameters. Find the measure of arc ZWX. (The figure is not drawn to scale.)



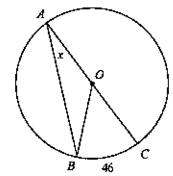
a. 226 b. 275 c. 39 d. 321

____ 4. Find the measure of $\angle BAC$. (The figure is not drawn to scale.)



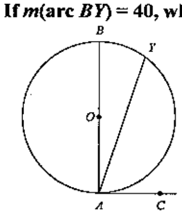
a. 57 b. 28.5 c. 33 d. 114

____ 5. Find x. (The figure is not drawn to scale.)



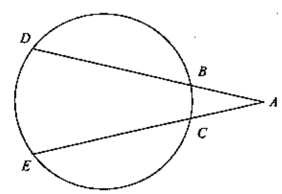
a. 92 b. 44 c. 23 d. 46

____ 6. If $m(\text{arc } BY) = 40$, what is $m\angle YAC$? (The figure is not drawn to scale.)



a. 140 b. 100 c. 70 d. 80

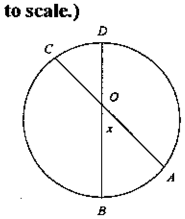
____ 7. $m(\text{arc } DE) = 96$ and $m(\text{arc } BC) = 67$. Find $m\angle A$. (The figure is not drawn to scale.)



a. 14.5 b. 62.5 c. 81.5 d. 29

22

____ 8. Find the value of x for $m(\text{arc } AB) = 46$ and $m(\text{arc } CD) = 25$. (The figure is not drawn to scale.)



a. 35.5°   b. 58.5°   c. 71°   d. 21°

____ 9. Write the standard equation for the circle with center (2, 7), $r = 4$

a. $(x-7)^2 + (y-2)^2 = 16$
b. $(x-2)^2 + (y-7)^2 = 4$
c. $(x-2)^2 + (y-7)^2 = 16$
d. $(x+2)^2 + (y+7)^2 = 4$

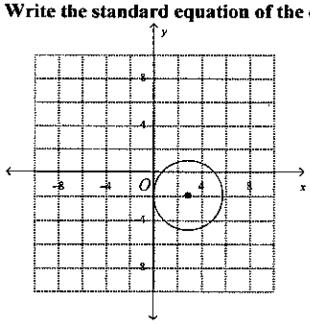
____ 10. Write the standard equation for the circle with center (–6, –8), that passes through (0, 0)

a. $(x-6)^2 + (y-8)^2 = 10$
b. $(x-6)^2 + (y-8)^2 = 196$
c. $(x+6)^2 + (y+8)^2 = 14$
d. $(x+6)^2 + (y+8)^2 = 100$

____ 11. Find the center and radius of the circle with equation $(x+9)^2 + (y+5)^2 = 64$.

a. center (5, 9); $r = 8$
b. center (9, 5); $r = 64$
c. center (–9, –5); $r = 64$
d. center (–9, –5); $r = 8$

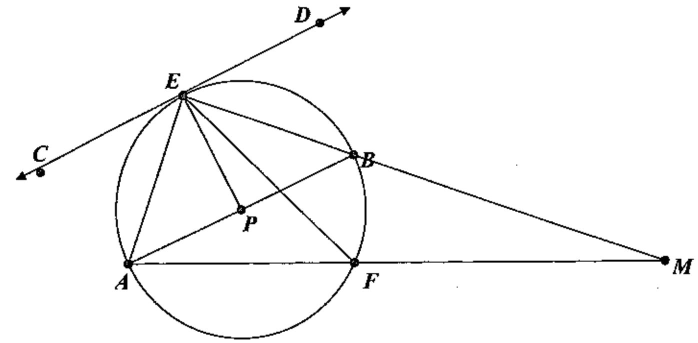
____ 12. Write the standard equation of the circle in the graph.



a. $(x+3)^2 + (y-2)^2 = 9$
b. $(x-3)^2 + (y+2)^2 = 9$
c. $(x-3)^2 + (y+2)^2 = 18$
d. $(x+3)^2 + (y-2)^2 = 18$

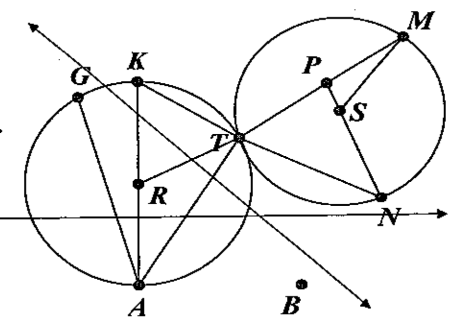
In the figure, $\overline{AB}$ is a diameter, P is the center of the circle, $\overline{CD}$ is a tangent to the circle at E. If $m\overset{\frown}{BE} = 100°$ and $m\overset{\frown}{BF} = 40°$, find the following measures:

13.____ $m\overset{\frown}{AF}$
14.____ $m\overset{\frown}{AE}$
15.____ m∠EPB
16.____ m∠CEA
17.____ m∠M
18.____ m∠EAB
19.____ m∠EFA
20.____ m∠PED
21.____ m∠AEP
22.____ m∠EFM
23.____ m∠DEF
24.____ m∠BAF



Matching. In the figure the two circles, with centers R and S, intersect only at T and $\overline{AB} \perp \overline{RA}$.

25. $\overleftrightarrow{AB}$ is a ____________.
26. $\overline{KA}$ is a ____________.
27. $\overline{NS}$ is a ____________.
28. $\overleftrightarrow{BG}$ is a ____________.
29. Circles R and S are __________ tangent.
30. $\overline{KT}$ is a ____________.
31. R is a ____________.
32. Point P is a(n) __________ of circle S.
33. Point B is a(n) __________ of circle S.



A. diameter   B. chord
C. secant   D. radius
E. center of circle   F. tangent
G. interior point   H. exterior point
I. externally   J. internally

34. In a circle with radius 6, a sector has an area 15π. What is the length of the arc of the sector?
Length of the arc = __________

35. The radius of a sector is 12 and the measure of the arc is 130°. What is
a) the length of the arc and   a) __________

b) the area of the sector   b) __________