Name _____

Honors Math III - Unit 6 - Circles

Date	Lesson/Objective	Homework
Thurs. Nov. 16	Tangents	HW 6-1
Fri. Nov. 17	Chords and Arcs	HW 6-2
Mon. Nov. 20	Inscribed Angles	HW 6-3
Tues. Nov. 21	Angle Measures and Segment Lengths	HW 6-4
Mon. Nov. 27	Equations of a Circle	HW 6-5
Tues. Nov. 28	Area of the Sector of a Circle and Arc Length	HW 6-6
Wed. Nov. 29	Review	Complete Review WS
Thurs. Nov. 30	Test	

Kuta Software - Infinite Geometry

HW 6-1
2 pages

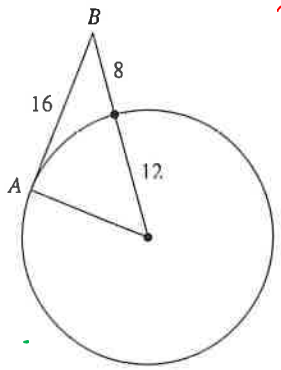
Name_____

Tangents to Circles

Date_____ Period____

Determine if line AB is tangent to the circle.

1)



$20^2 = 12^2 + 16^2$

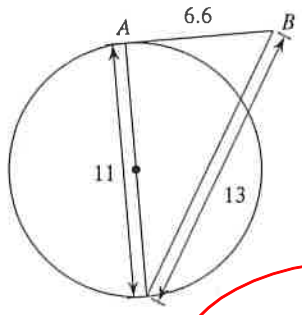
$400 = 144 + 256$

$144 = 12$

$12 = 12$

Yes

2)

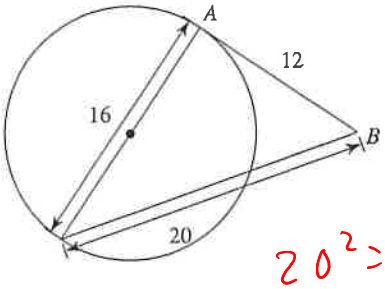


$169 = 121 + 43.56$

$169 \neq 164.56$

No

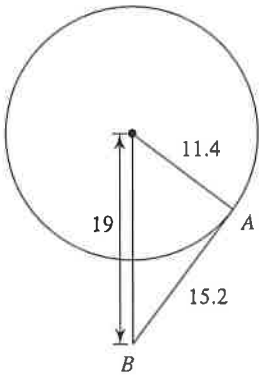
3)



$20^2 = 12^2 + 16^2$ ✓

yes

4)

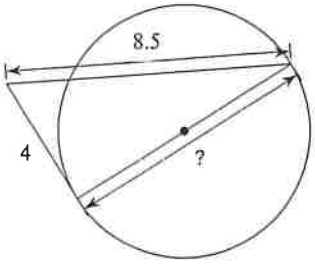


$19^2 = 11.4^2 + 15.2^2$

Yes

Find the segment length indicated. Assume that lines which appear to be tangent are tangent.

5)

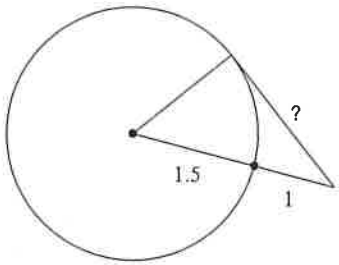


$8.5^2 - 4^2$

$x = 7.5$

$15/2$

6)

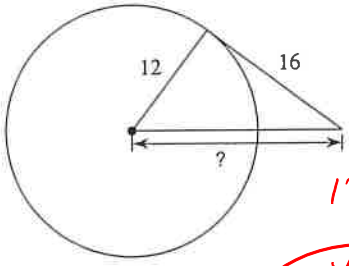


$2.5^2 - 1.5^2 = 4$

$\sqrt{4} = 2$

$x = 2$

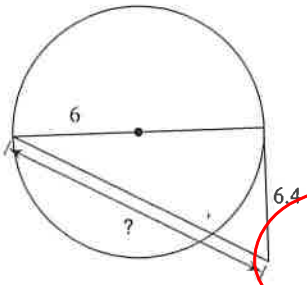
7)



$12^2 + 16^2 = x^2$

$x = 20$

8)

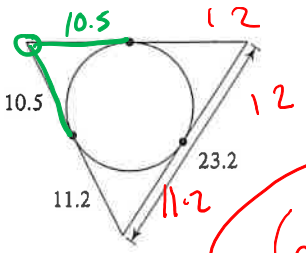


$12^2 + 6.4^2 = x^2$

$x = 13.6$

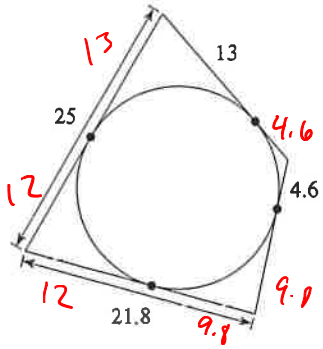
Find the perimeter of each polygon. Assume that lines which appear to be tangent are tangent.

9)



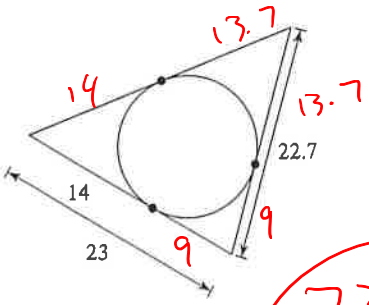
67.4

10)



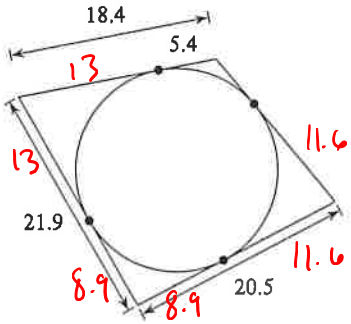
78.8

11)



73.4

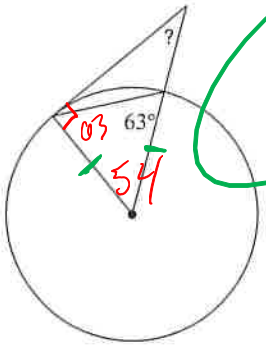
12)



77.8

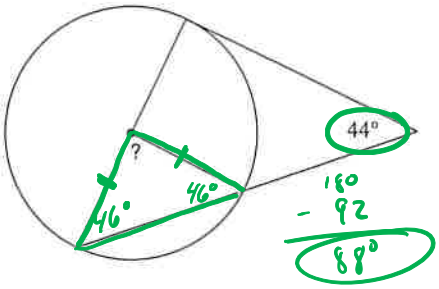
Find the angle measure indicated. Assume that lines which appear to be tangent are tangent.

13)



36°

14)

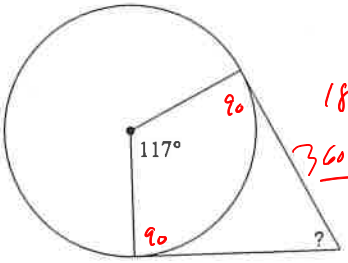


$90+44 = 134$

$180 - 134 = 46°$

$180 - 92 = 88°$

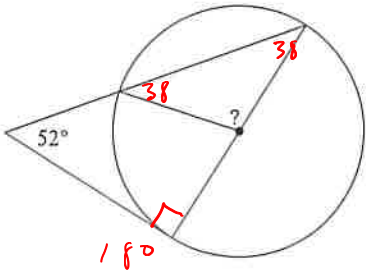
15)



$180+117$

$360-297 = 63°$

16)



$180 - 142 = 38$

$180 - 76 = 104°$

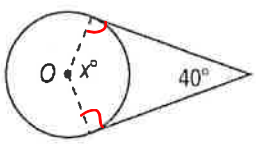
Tangents of Circles

Name: _____

Math 3

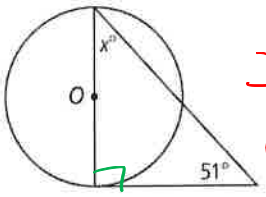
Directions: Assume that lines that appear to be tangent are tangent. O is the center of each circle. What is the value of x?

1.



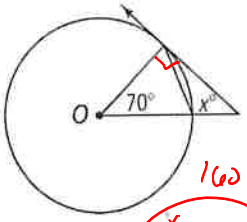
$x = 140°$

2.



180
−141
39°

3.

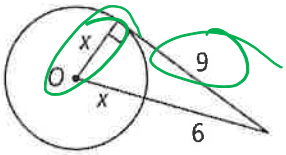


160

$x = 20°$

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

4.



$x^2 + 9^2 = (6+x)^2$

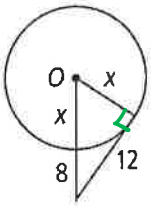
$x^2 + 81 = x^2 + 12x + 36$

$0 = 12x - 45$

$x = 45/12 = \frac{15}{4} = 3.75$

3.8

5.



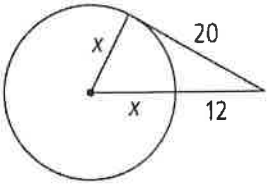
$(x+8)^2 = x^2 + 12^2$

$x^2 + 16x + 64 = x^2 + 144$

$16x - 80 = 0$

$x = 5$

6.



$(x+12)^2 = x^2 + 20^2$

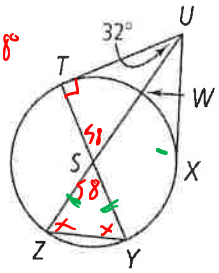
$x^2 + 24x + 144 = x^2 + 400$

$24x - 256 = 0$

$x = \frac{32}{3}$

10.7

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



$180 - 122 = 58°$

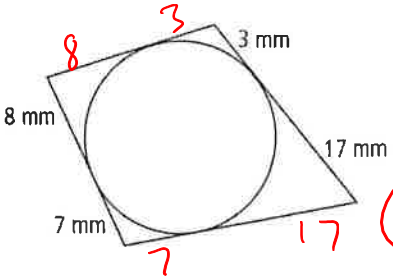
$2x + 58 = 180$

$2x = 122$

$x = 61°$

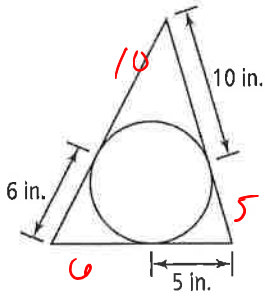
Directions: Each polygon circumscribes a circle. What is the perimeter of each polygon?

8.



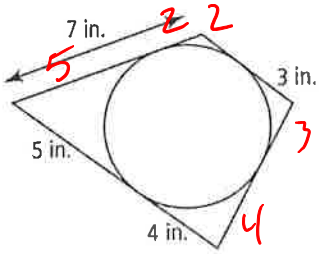
70 mm

9.



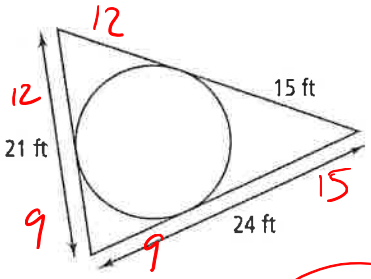
42 in

10.



28 in

11.



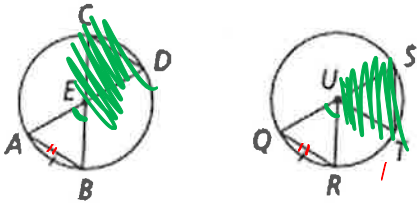
72 ft

Practice 6-2 Chords & Arcs of Circles

Math 3

Name: _____ HW 6-2

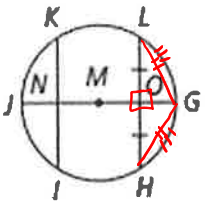
1. The circles at the right are congruent. Which conclusion can you draw?



Ⓐ $\overline{CD} \cong \overline{ST}$ Ⓒ $\angle AEB \cong \angle QUR$

Ⓑ $\angle CED \cong \angle SUT$ Ⓓ $\overset{\frown}{BD} \cong \overset{\frown}{RT}$

2. $\overline{JG}$ is the diameter of $\odot M$. Which conclusion *cannot* be drawn from the diagram?

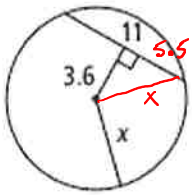


Ⓕ $\overline{KN} \cong \overline{NI}$ Ⓗ $\overline{JG} \perp \overline{HL}$

Ⓖ $\overset{\frown}{LG} \cong \overset{\frown}{GH}$ Ⓘ $\overline{GH} \cong \overline{GL}$

For Exercises 3 and 4, what is the value of x to the nearest tenth?

3.

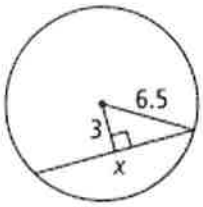


$5.5^2 + 3.6^2 = x^2$

Ⓐ 4.2 Ⓒ 10.4

Ⓑ 6.6 Ⓓ 11.6

4.



$\left(\frac{x}{2}\right)^2 + 3^2 = 6.5^2$

$\frac{x^2}{4} + 9 = 42.25$

$\frac{x^2}{4} = 33.25$

$x^2 = 133$

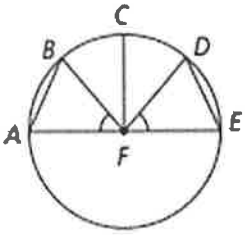
$x = \sqrt{133}$

11.5

Ⓕ 3.6 Ⓗ 11.5

Ⓖ 5.8 Ⓘ 14.3

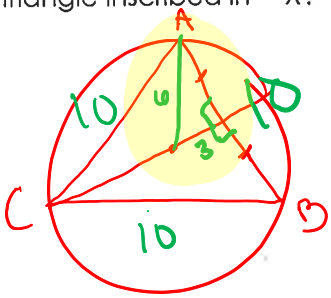
5. If $\angle AFB \cong \angle DFE$, what must be true?



Ⓐ $\overset{\frown}{AB} \cong \overset{\frown}{DE}$ Ⓒ $\overline{CF} \perp \overline{AE}$

Ⓑ $\overset{\frown}{BC} \cong \overset{\frown}{DE}$ Ⓓ $\angle BFC \cong \angle DFC$

6. A student draws $\odot X$ with a diameter of 12 cm. Inside the circle she inscribes equilateral ΔABC so that $\overline{AB}$, $\overline{BC}$, and $\overline{CA}$ are all chords of the circle. The diameter of $\odot X$ bisects $\overline{AB}$. The section of the diameter from the center of the circle to where it bisects $\overline{AB}$ is 3 cm. To the nearest whole number, what is the perimeter of the equilateral triangle inscribed in $\odot X$?



$6^2 - 3^2 = x^2$

$36 - 9 = x^2$

$27 = x^2$

$x = 5.19$

31 cm

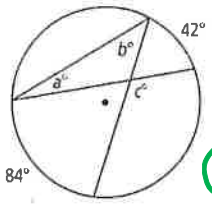
Homework 6.3 Inscribed Angles

Math 3

Name: HW 6-3

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

1.

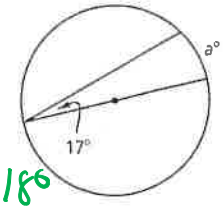


a = 21°

b = 42°

c = 117°

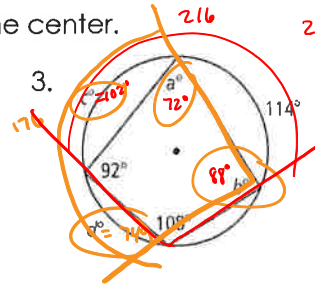
2.



a = 34°

180 − 63

3.



216

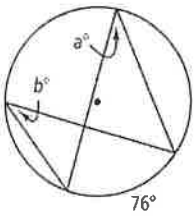
216−114

102°

176−102

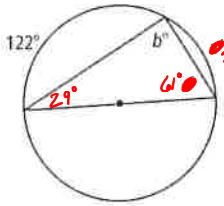
d =

4.



a = b = 38°

5.

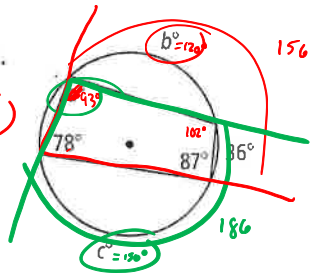


180 − 122

a = 58°

180 − 61 − 29 = 90°

6.

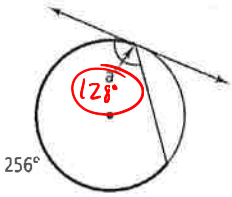


156

186

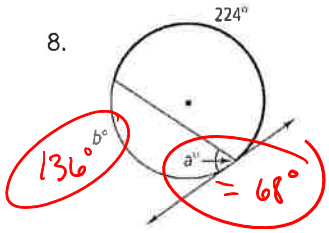
Directions: Find the value of each variable. Lines that appear to be tangent are tangent.

7.



128°

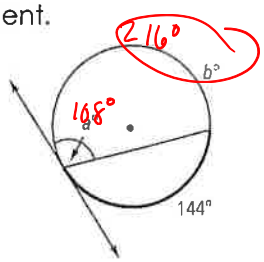
8.



136°

= 68°

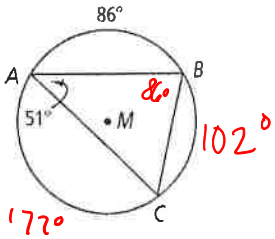
9.



216°

108°

Directions: Find each indicated measure for ⊙M.



86°

102°

172°

10. $m\angle B$ 86°

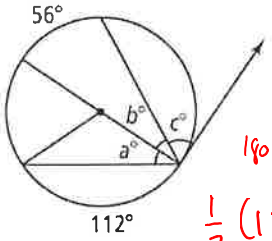
11. $m\angle C$ 43°

12. $m\widehat{BC}$ 102°

13. $m\widehat{AC}$ 172°

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

14.



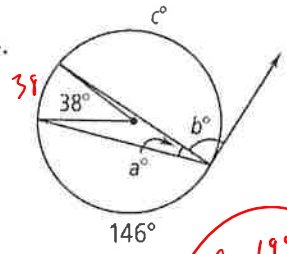
180 − 56

180 − 112

$\frac{1}{2}(124)$ $\frac{1}{2}(68)$

b = 28° c = 62° a = 34°

15.



38

360 − 38 − 146

360 − 184

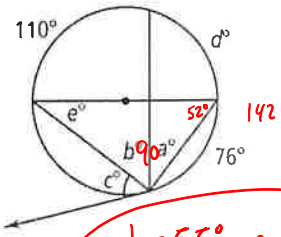
176

a = 19°

c = 176°

b = 88°

16.



142

b = 55° e = 38°

a = 35°

d = 76°

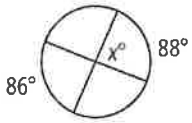
c = 52°

Homework 6.4: Angles and Segments

Name: HW 6-4

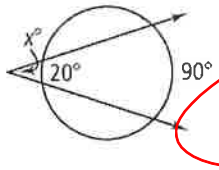
Math 3

Directions: Solve for x.

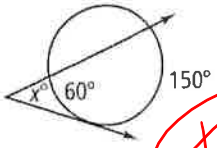
1. 

174 ÷ 2

87°

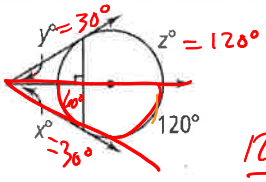
2. 

x = 35°

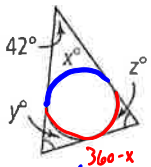
3. 

x = 45°

Directions: Solve for each variable listed.

4. 

$\frac{120-60}{2} = 30°$

5. 

360 − x

$42 = \frac{(360-x)-x}{2}$

84 = 360 − 2x

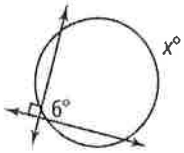
−276 = −2x

x = 138°

360 − 138 = 222°

$\frac{222°}{2} = 111°$

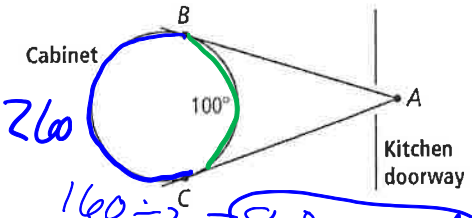
z = y = 111

6. 

$\frac{x-6}{2} = 90$

x = 186°

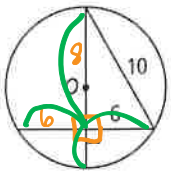
7. There is a circular cabinet in the dining room. Looking in from another room at point A, you estimate that you can see an arc of the cabinet of about 100°. What is the measure of ∠A formed by the tangents to the cabinet?



260

160 ÷ 2 = 80° = m∠A

Directions: Find the diameter of ⊙O. A line that appears to be tangent is tangent. If your answer is not a whole number, round to the nearest tenth.

8. 

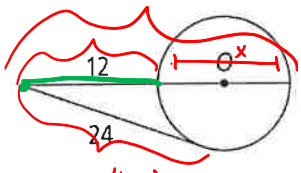
$a^2 + 6^2 = 10^2$

$6 \cdot 6 = 8x$

$36 = 8x$

$\frac{9}{2} = x$

$8 + \frac{9}{2} = \frac{25}{2} = 12.5$

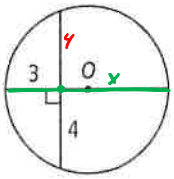
9. 

$12 \cdot (12+x) = 24 \cdot 24$

$12x + 144 = 576$

$12x = 432$

x = 36

10. 

$x \cdot 3 = 16$

$x = \frac{16}{3} + 3 = \frac{25}{3} \approx 8.3$

Directions: $\overline{CA}$ and $\overline{CB}$ are tangents to ⊙O. Write an expression for each arc or angle in terms of the given variable.

11. $\overset{z}{m\widehat{AB}}$ using x

$y = \frac{x-z}{2}$

$2y = x - z$

$x - 2y = z$

$x - 2\left(\frac{x-(360-x)}{2}\right)$

$z = x - 2\left(\frac{2x-360}{2}\right)$

$x - 2x + 360$

$360 - x$

12. $\overset{z}{m\widehat{AB}}$ using y

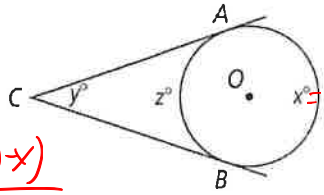
$y = \frac{x-z}{2}$

$z = 360 - z - 2y$

$2z = 360 - 2y$

$z = 180 - y$

13. $\overset{y}{m\angle C}$ using x



360 − z

$y = \frac{x-(360-x)}{2}$

$y = \frac{2x-360}{2}$

$y = x - 180$

Homework 6.5: Equations of Circles

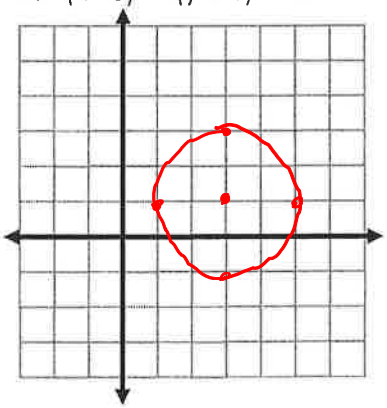
Math 3

Name: HW 6-5 2 pages

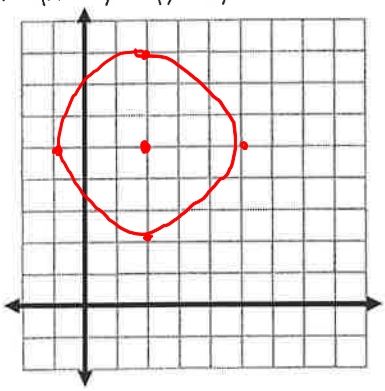
e: If r^2 is not a perfect square then leave r in simplified radical form but use the decimal equivalent for graphing. Example: $\sqrt{12} = 2\sqrt{3} = 3.46$

1) **Graph the following circle:**

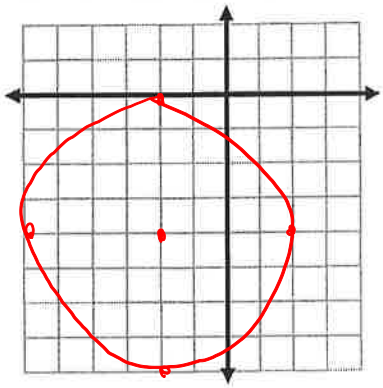
a. $(x - 3)^2 + (y + 1)^2 = 4$



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: (-3, 1)

Radius: 2

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

Center: (0, 3)

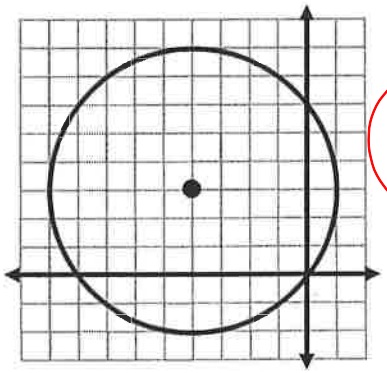
Radius: $3\sqrt{2}$

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

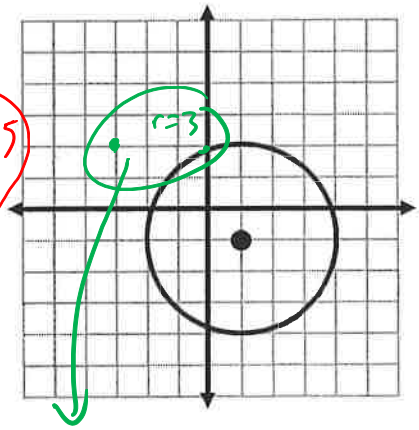
Center: (-2, -8)

Radius: $6\sqrt{2}$

3) **Write the equation of the following circles:**



$(x+4)+(y-3)=25$



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

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

$(x+3)^2+(y-2)^2=9$

5) **Compare and contrast the following pairs of circles**

a. Circle #1: $(x - 3)^2 + (y + 1)^2 = 25$ 3, -1

Circle #2: $(x + 1)^2 + (y - 2)^2 = 25$ -1, 2

Left 4 up 3

Same r

b. Circle #1: $(y + 4)^2 + (x + 7)^2 = 6$ -7, -4 $r=\sqrt{6}$

Circle #2: $(x + 7)^2 + (y + 4)^2 = 36$ -7, -4 r=6

Same center

6) **Find the standard form, center, and radius of the following circles:**

a. $x^2 + y^2 - 4x + 8y - 5 = 0$

$(x-2)^2 + (y+4)^2 = 25$

$(2,-4)$ $r=5$

b. $4x^2 + 4y^2 + 36y + 5 = 0$

$x^2 + y^2 + 9y = -\frac{5}{4}$

$x^2 + (y+3)^2 = \frac{31}{4}$

$(0,-3)$ $r = \frac{\sqrt{31}}{2}$

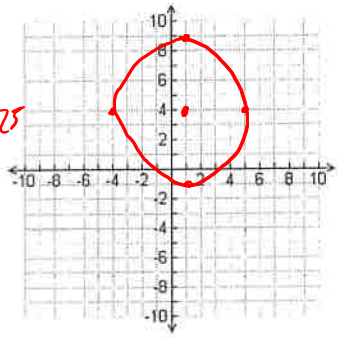
Center:_____ Radius:_____

Center:_____ Radius:_____

7) **Graph the following circles.**

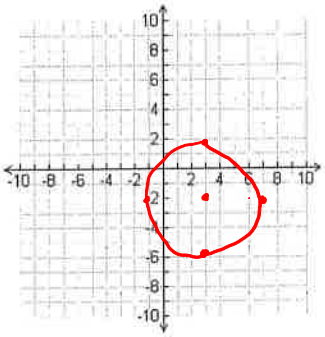
a. $x^2 - 2x + y^2 + 8y - 8 = 0$

$(x-1)^2 + (y+4)^2 = 25$



b. $x^2 + y^2 - 6x + 4y - 3 = 0$

$(x-3)^2 + (y+2)^2 = 16$



8) Give the equation of the circle whose center is (5,-3) and goes through (2,5)

$(x-5)^2 + (y+3)^2 = 73$

9) Give the equation whose endpoints of a diameter at (-4,1) and (4, -5)

$0, -2$

$x^2 + (y+2)^2 = 25$

10) Give the equation of the circle whose center is (4,-3) and goes through (1,5)

$(x-4)^2 + (y+3)^2 = 73$

11) Give the equation whose endpoints of a diameter at (-3,2) and (1, -5)

$(x+1)^2 + (y+1.5)^2 = \frac{65}{4}$

Kuta Software - Infinite Algebra 2

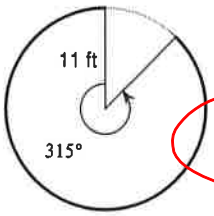
Name HW 6-6 2 pages

Arc Length and Sector Area

Date_____ Period____

Find the length of each arc. Round your answers to the nearest tenth.

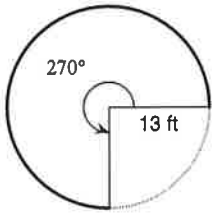
1)



$\frac{315}{360} \cdot 2 \cdot \pi \cdot 11$

60.5 ft

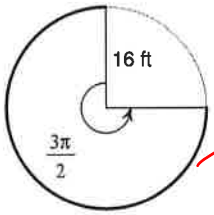
2)



$\frac{3}{4} \cdot 2 \cdot \pi \cdot 13$

61.3 ft

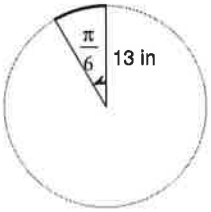
3)



$\frac{\frac{3\pi}{2}}{2\pi} \cdot 2 \cdot \pi \cdot 16$

75.4 ft

4)



$\frac{\frac{\pi}{6}}{2\pi} \cdot 2\pi 13$

6.8 in

5) $r = 18$ cm, $\theta = 60°$ $\frac{1}{6} \cdot 2 \cdot \pi \cdot 18$ 18.8 cm

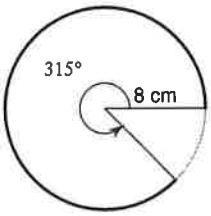
6) $r = 16$ m, $\theta = 75°$ $\frac{75}{360} \cdot 2 \cdot \pi \cdot 16$ 20.9 m

7) $r = 9$ ft, $\theta = \frac{7\pi}{4}$ $\frac{\frac{7\pi}{4}}{2\pi} \cdot 2 \cdot \pi \cdot 9$ 49.5 ft

8) $r = 14$ ft, $\theta = \frac{19\pi}{12}$ $\frac{\frac{19\pi}{12}}{2\pi} \cdot 2\pi 14$ 69.6 ft

Find the length of each arc. Do not round.

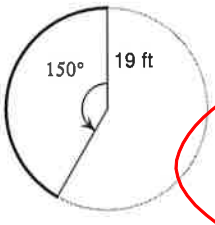
9)



$\frac{315}{360} \cdot 2 \cdot \pi \cdot 8$

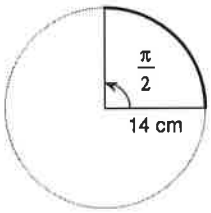
14π cm

10)



$\frac{95}{6}\pi$ ft

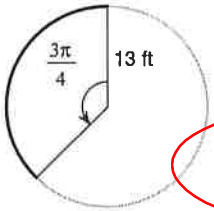
11)



$\frac{1}{4} \cdot 2\pi \cdot 14$

7π cm

12)

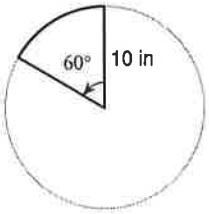


$\frac{1}{3} \cdot 2\pi \cdot 13$

$\frac{39}{4}\pi$ ft

Find the area of each sector. Round your answers to the nearest tenth.

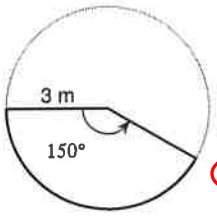
13)



$\frac{1}{6} \cdot \pi \cdot 100$

52.4 in^2

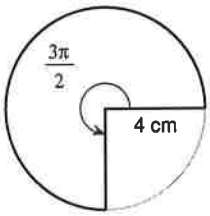
14)



$\frac{150}{360} \cdot \pi \cdot 9$

11.8 m^2

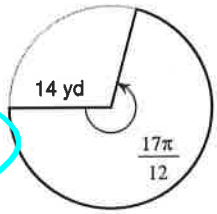
15)



$\frac{\frac{3\pi}{2}}{2\pi} \cdot \pi r^2$

37 cm^2

16)

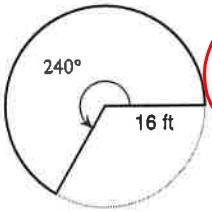


$\frac{\frac{17\pi}{12}}{2\pi} \pi 14^2$

436.2 yd^2

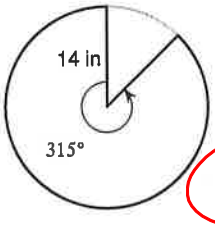
Find the area of each sector. Do not round.

17)



$\frac{512}{3}\pi \text{ ft}^2$

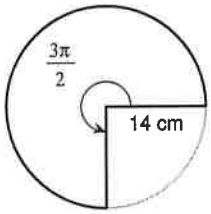
18)



$\frac{315}{360} \cdot \pi 14^2$

$\frac{343}{2}\pi \text{ in}^2$

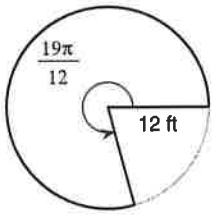
19)



$\frac{\frac{3\pi}{2}}{2\pi} \cdot \pi 196$ 49

$147\pi \text{ cm}^2$

20)



$\frac{\frac{19\pi}{12}}{2\pi} \cdot \pi 144$ 6

$114\pi \text{ ft}^2$

21) $r = 10$ mi, $\theta = \frac{\pi}{2}$

$\frac{\frac{\pi}{2}}{2\pi} \cdot \pi 100$

25π

22) $r = 12$ yd, $\theta = \frac{5\pi}{3}$

$\frac{\frac{5\pi}{3}}{2\pi} \pi 144$

$120\pi \text{ yd}^2$

23) $r = 7$ km, $\theta = 60°$

$\frac{1}{6} \pi 49$

$\frac{49}{6}\pi \text{ Km}^2$

24) $r = 7$ mi, $\theta = 225°$

$\frac{225}{360} \pi 49$

$\frac{245}{8}\pi \text{ mi}^2$