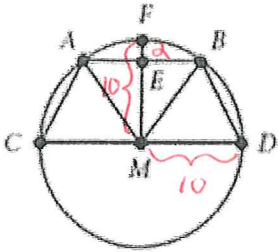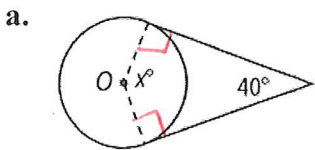Name: **ANSWERS**   Period_____ Date_____

Geometry 22: Practice with 12.1 and 12.3 ☺

1. In $\odot M$, $\overline{FM} \perp \overline{AB}$, $\overline{CD}$ is a diameter, $MD = 10$ and $FE = 2$. Find the following.
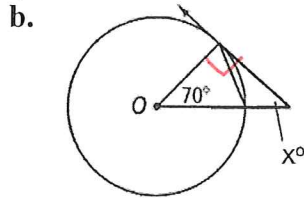

a. $CD = $ __**20**__

b. $ME = $ __**8**__

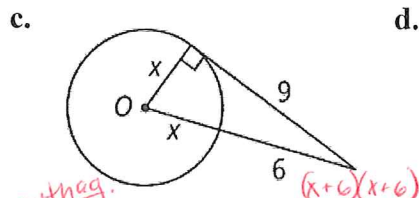2. What is the value of x? Lines that appear to be tangent are tangent. Round to the nearest hundredth if necessary.

a.

$X + 90 + 90 + 40 = 360$
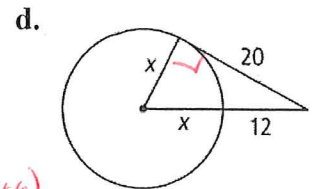
$\boxed{X = 140°}$

b.

$X + 70 + 90 = 180$

$\boxed{X = 20°}$

c.

pythag.

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

$\cancel{x^2} + 81 = \cancel{x^2} + 12x + 36$

$\quad -36 \quad -36$

$45 = 12x \quad \boxed{x = 3.75}$

d.

$(x+6)(x+6)$

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

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

$\cancel{x^2} - 144 \quad \cancel{x^2} \quad -144$

$\dfrac{256}{24} = \dfrac{24x}{24}$

$\boxed{x = 10.\overline{6}}$

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

a.

16   10   10 in.

6 in.   15

5   5 in.

6

11

$\boxed{p = 42 \text{ in}}$

b.

12   27

12   15 ft

21 ft

9   24 ft   15

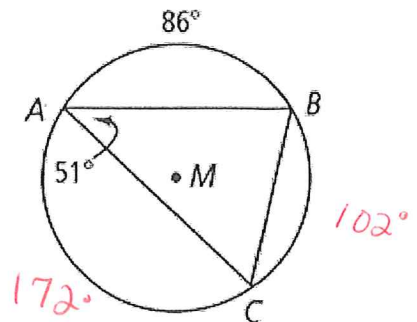9
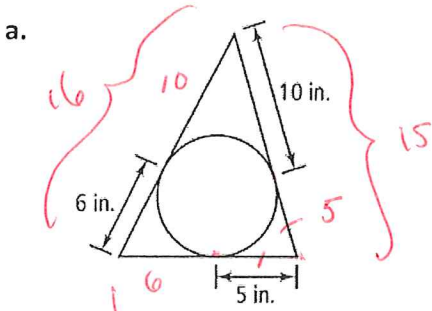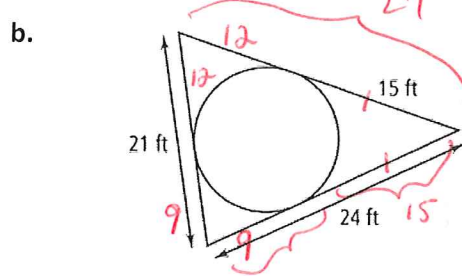
$21 + 24 + 27 = \boxed{72 \text{ ft}}$

4. Find each indicated measure for circle M.

a. $m\widehat{BC} = $ __**102°**__ $(51)(2) = 102°$

b. $m\widehat{AC} = $ __**172°**__ $360 - 102 - 86$
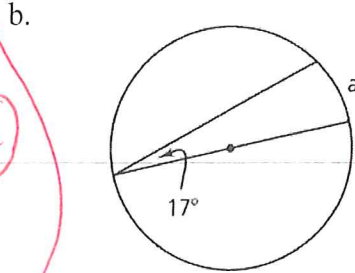
c. $m\angle B = $ __**86°**__ $172/2 = 86$

d. $m\angle C = $ __**43°**__ $86/2 = 43$

5. Find the value of each variable. For j, k, and l, lines that appear to be tangent are.
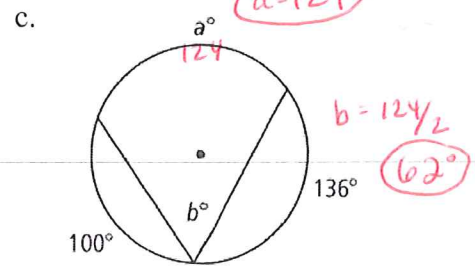
a.

a°

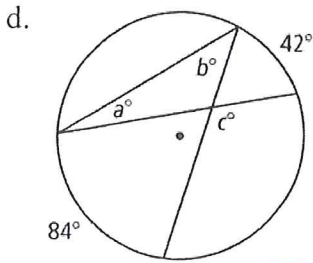136°

$\frac{136}{2} = \boxed{68^\circ = a}$

b.

a°

17°

$a = \frac{(17)(2)}{}$
$\boxed{34^\circ}$

c.

a°
124

136°

b°

100°

$a = 360 - 136 - 100$
$\boxed{a = 124^\circ}$

$b = \frac{124}{2}$
$\boxed{62^\circ}$

d.

42°
b°
a°
c°
84°

$a = \frac{42}{2} = \boxed{21^\circ}$

$b = \frac{84}{2} = \boxed{42^\circ}$

$C = 180 - 21 - 42$
$\boxed{C = 117^\circ}$

e.

122°
b°
a°
29°
61° c°

$b = \frac{180}{2} = \boxed{90^\circ}$

$C = \frac{122}{2} =$
$\boxed{61^\circ}$

$a = (29)(2) = \boxed{58^\circ}$

f.

a°
b°
76°

$a = \frac{76}{2} = \boxed{38}$

$b = \frac{76}{2} = \boxed{38^\circ}$

g.

39°
50°
b°
c°
a°

$180 - 50$
$\boxed{130^\circ}$

$b = \frac{180}{2} = \boxed{90^\circ}$

$a = (39)(2) =$
$\boxed{78^\circ}$

$c = \frac{130}{2} = \boxed{65^\circ}$

h.

b°
$\boxed{120^\circ}$
a°
78°
87° 36°
150°
c°

$a = 180 - 87$
$\boxed{93}$

$(18)(2) = 156^\circ$
-36°

$(93)(2) = 186^\circ$

$C = 186 - 36 =$
$\boxed{150^\circ}$

i.

216
$216 - 114 =$
c° $\boxed{102}$ a° 72°
114°
92°
88°
b°
184
d°
108°
70°

$\frac{176}{-102}$
$\boxed{74^\circ}$

$a = 180 - 108 =$
$\boxed{72^\circ}$

$b = 180 - 92$
$\boxed{88^\circ}$

$\boxed{d = 74^\circ}$

j.

a°
256°

$a = \frac{256}{2} = \boxed{128^\circ}$

k.

224°
b°
a°

$\frac{360}{-224}$
$\boxed{136^\circ}$

$a = \frac{136}{2} = \boxed{68^\circ}$

l.

b°
a°
144°
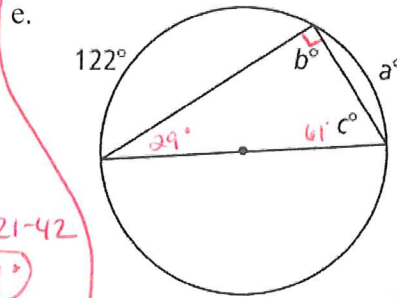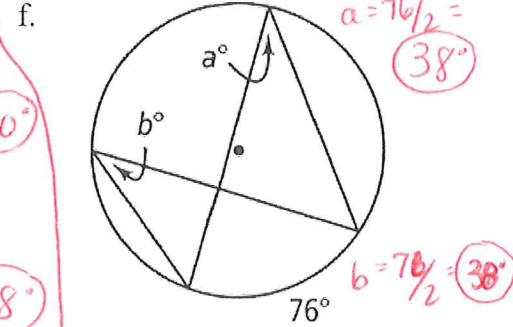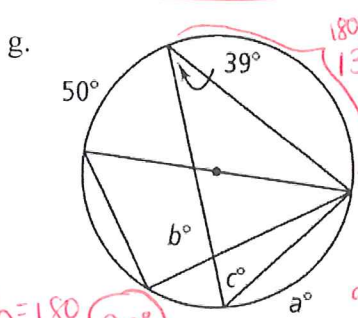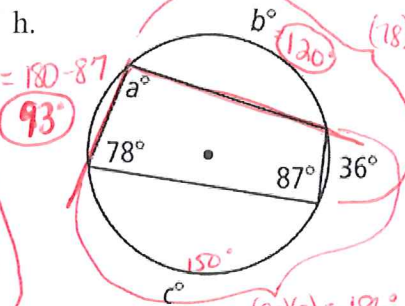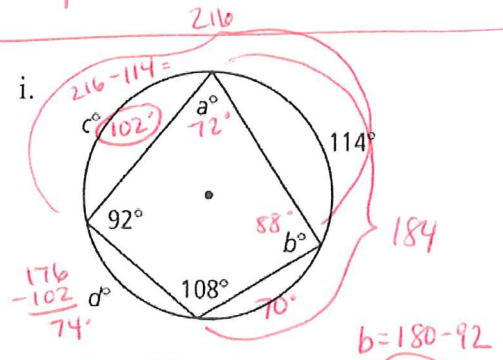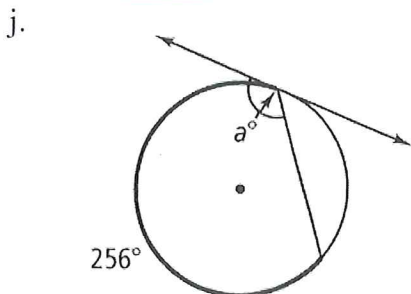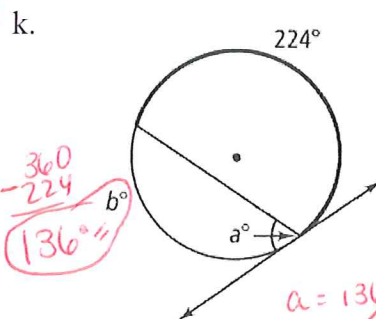
$\frac{360}{-144}$
$\boxed{216^\circ}$

$a = \frac{216}{2}$
$= \boxed{108^\circ}$

1. A student inscribed a quadrilateral *ABCD* inside a circle. The measures of angles *A*, *B*, and *C* are given below. Find the measure of each angle of quadrilateral *ABCD*.

$x = 12$

$m\angle A = 8x - 4$ $\boxed{92^\circ}$ $m\angle B = 5x + 4$ $\boxed{64^\circ}$ $m\angle C = 7x + 4$ $\boxed{88^\circ}$

$m\angle D = \boxed{116^\circ}$
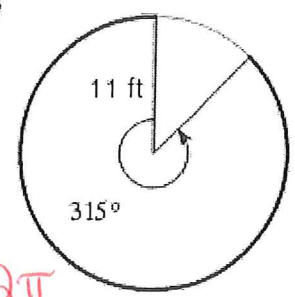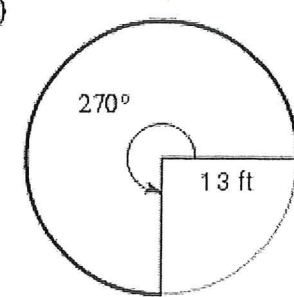
$8x - 4 + 5x + 4 + 7x + 4 + (360 - 5x + 4) = 360$
$\angle A, \angle C$ are supplementary $8x - 4 + 7x + 4 = 180$
$15x = 180$
$\boxed{x = 12}$
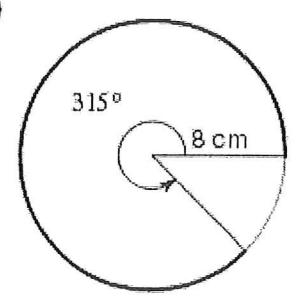
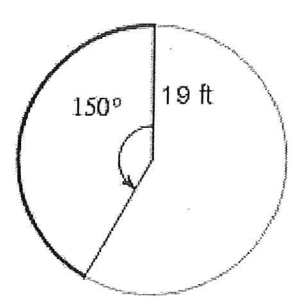## Find the length of each arc. Round your answers to the nearest tenth.

1)

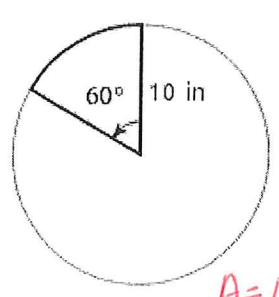$\frac{L}{22\pi} = \frac{315}{360}$

11 ft

19.25π

315°

$C = 22\pi$

$L \approx 60.5$ ft

2)

$C = 26\pi$

270°

13 ft

$\frac{L}{26\pi} = \frac{270}{360}$

$\frac{3}{4}$

19.5π

$L = 61.3$ ft

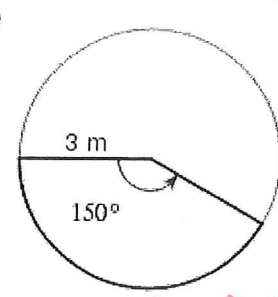## Find the length of each arc and leave answers in terms of pi.

9)

315°

8 cm

$\frac{L}{16\pi} = \frac{315}{360}$

$L = 14\pi$ cm
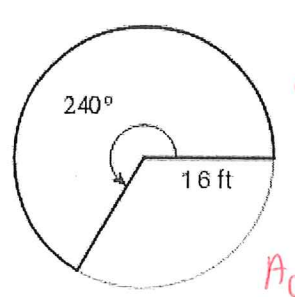
$C = 16\pi$

10)

150° 19 ft

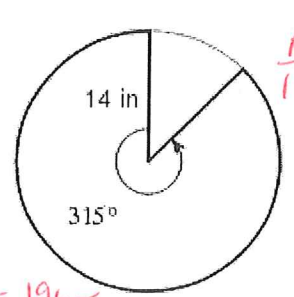$\frac{L}{38\pi} = \frac{150}{360}$

$15.8\overline{3}\pi$

$C = 38\pi$

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

13)

60° 10 in

$\frac{A}{100\pi} = \frac{60}{360}$

$16.\overline{6}\pi \approx 52.4 \text{ in}^2$

$A = 100\pi$

14)

3 m

150°

$\frac{A}{9\pi} = \frac{150}{360}$

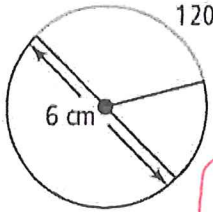$3.75\pi \approx$

11.8 m^2

$A_\theta = 9\pi$

Find the area of each sector. Do not round. Leave answers in terms of pi.

17)

240°

16 ft

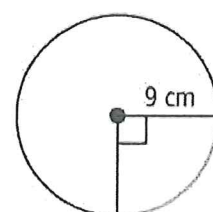$\frac{A}{256\pi} = \frac{240}{360}$

$170.\overline{6}\pi$

$A_\theta = 256\pi$

18)

14 in

315°

$\frac{A}{196\pi} = \frac{315}{360}$

$171.5\pi \text{ in}^2$
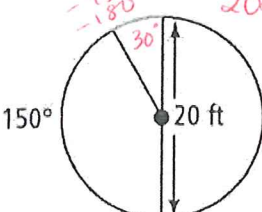
$A_\theta = 196\pi$

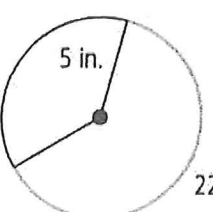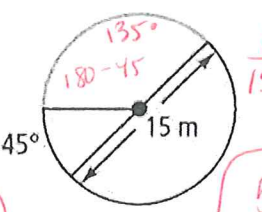**Lesson 10-6**

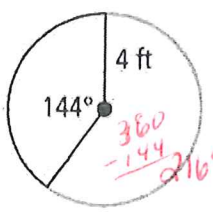(a) Find the circumference of each circle. (b) Find the length of the arc shown in gray. Leave your answers in terms of π

30.

120°

6 cm

$\frac{L}{6\pi} = \frac{120}{360}$ ... 3

$L = 2\pi \text{ cm}$

$C = 6\pi$

31.

360/150 = 180

30°

150° 20 ft

$\frac{L}{20\pi} = \frac{30}{360}$ 12

$1.6\overline{6}\pi \text{ ft}$

$C = 20\pi$

32.

9 cm

$\frac{L}{18\pi} = \frac{90}{360}$ 4

$4.5\pi \text{ cm}$

$C = 18\pi$

33.

5 in.

225°

$\frac{L}{10\pi} = \frac{225}{360}$

$6.25\pi \text{ in}$

$C = 10\pi$

34.

135° 180-45

45° 15 m

$\frac{L}{15\pi} = \frac{135}{360}$

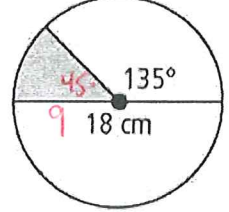5.625π

$C = 15\pi$

35.

4 ft

144°

360 - 144 = 216°

$\frac{L}{8\pi} = \frac{216}{360}$

$4.8\pi \text{ ft}$
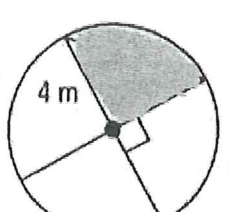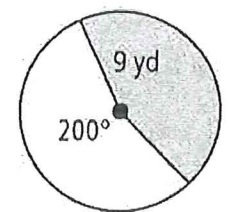
$C = 8\pi$
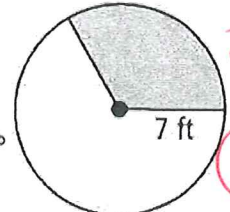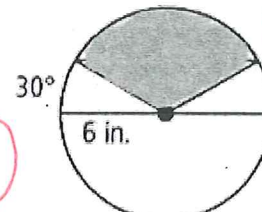
Lesson 10-7

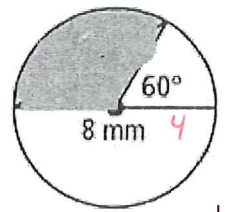Find the area of each shaded sector or segment. Leave your answers in terms of π

37.

7 ft

240°

$\frac{A}{49\pi} = \frac{120}{360}$

$16.3\overline{3}\pi \text{ ft}^2$

38.

30° 30°

6 in.

$\frac{A}{36\pi} = \frac{120}{360}$

$12\pi \text{ in}^2$

39.

135°

45° 18 cm

$\frac{A}{81\pi} = \frac{45}{360}$

$10.125\pi \text{ cm}^2$

40.

4 m

$\frac{A}{16\pi} = \frac{90}{360}$ 4

$4\pi \text{ m}^2$

9 yd

200°

$\frac{A}{81\pi} = \frac{160}{360}$

$36\pi \text{ yd}^2$

60°

8 mm

$\frac{A}{16\pi} = \frac{120}{360}$ 3

$5.3\overline{3} \text{ mm}^2$

Name: **ANSWERS** Period____ Date_____

Geometry 22: Practice with 12.5 – Circles in the Coordinate Plane ☺ (simpler)

Find the center and radius of each circle.

1. $x^2 + y^2 = 36$ Center $(0,0)$
   $r = 6$

2. $(x - 2)^2 + (y - 7)^2 = 49$ Center $(2,7)$
   $r = 7$

3. $(x + 1)^2 + (y + 6)^2 = 16$ center $(-1,-6)$
   $r = 4$

4. $(x + 3)^2 + (y - 11)^2 = 12$ center $(-3, 11)$
   $r = \sqrt{12} = 2\sqrt{3}$

Write the standard equation of each circle.

5. center $(0, 0)$; $r = 7$

$$x^2 + y^2 = 49$$

6. center $(4, 3)$; $r = 8$

$$(x-4)^2 + (y-3)^2 = 64$$

7. center $(5, 3)$; $r = 2$

$$(x-5)^2 + (y-3)^2 = 4$$

8. center $(-5, 4)$; $r = \dfrac{1}{2}$

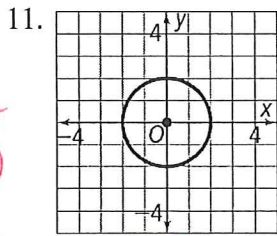$$(x+5)^2 + (y-4)^2 = \frac{1}{4}$$

9. center $(-2, -5)$; $r = \sqrt{2}$

$$(x+2)^2 + (y+5)^2 = 2$$
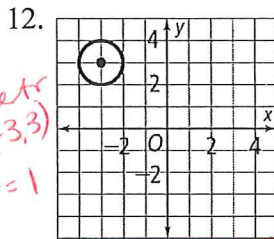
10. center $(-1, 6)$; $r = \sqrt{5}$

$$(x+1)^2 + (y-6)^2 = 5$$
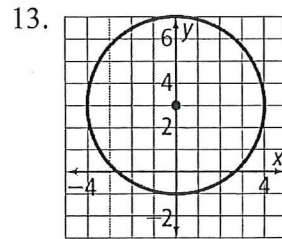
Write the standard equation of each circle.

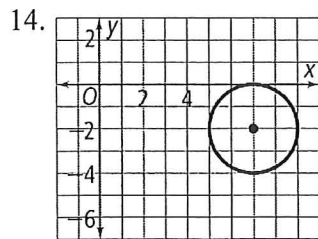11.

Center $(0,0)$
$r = 2$

$$x^2 + y^2 = 4$$

12.

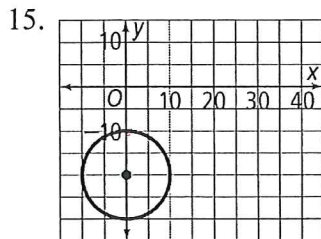cetr $(-3,3)$
$r = 1$

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

13.

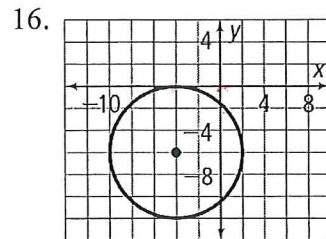center $(0,3)$
$r = 4$

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

14.

centr $(7, -2)$
$r = 2$

$$(x-7)^2 + (y+2)^2 = 4$$

15.

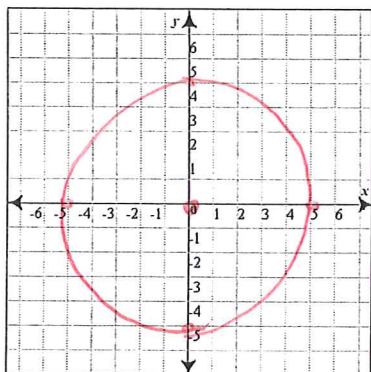enter $(0, -20)$
$r = 10$

$$x^2 + (y+20)^2 = 100$$

16.

center $(-4, -6)$
$r = 6$

$$(x+4)^2 + (y+6)^2 = 36$$

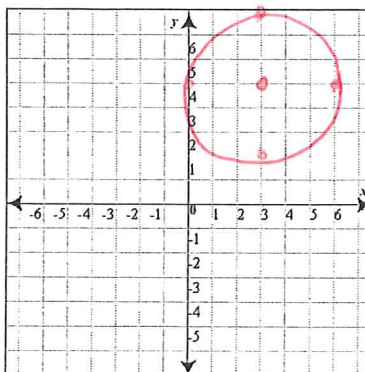Find the center and radius of each circle. Then graph the circle.
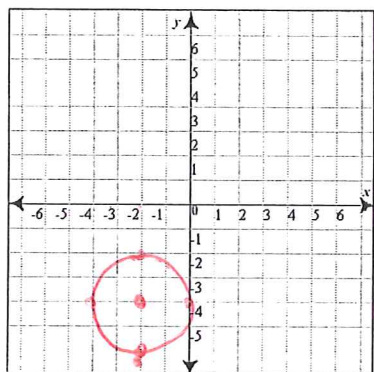
17. $x^2 + y^2 = 25$

Centr $(0,0)$
$r = 5$
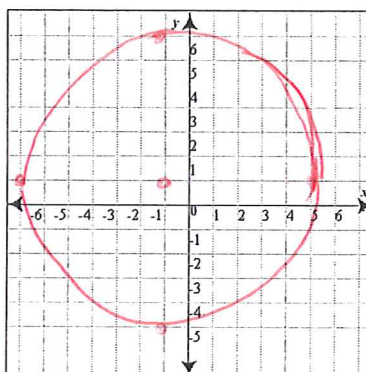
18. $(x-3)^2 + (y-5)^2 = 9$

Cntr $(3,5)$
$r = 3$

19. $(x+2)^2 + (y+4)^2 = 4$

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

20. $(x+1)^2 + (y-1)^2 = 36$

Cntr $(-1,1)$
$r = 6$

Write the standard equation of the circle with the given center that passes through the given point.

21. center (0, 0); point $\overset{x}{(3,} \overset{y}{4)}$

$x^2 + y^2 = r^2$ $\boxed{x^2 + y^2 = 25}$
$3^2 + y^2 = r^2$
$9 + 16 = 25 = r^2$

22. center (5, 9); point $\overset{x}{(2,} \overset{y}{9)}$

$(x-5)^2 + (y-9)^2 = r^2$
$(2-5)^2 + (9-9)^2 = r^2$ $\boxed{(x-5)^2 + (y-9)^2 = 9}$
$9 = r^2$

23. center (−4, −3); point (2, 2)

$(x+4)^2 + (y+3)^2 = r^2$
$(2+4)^2 + (2+3)^2 = r^2$ $\boxed{(x+4)^2 + (y+3)^2 = 61}$
$6^2 + 5^2$
$36 + 25 = 61$

24. center (7, −2); point $\overset{x}{(-1,} \overset{y}{-6)}$

$(x-7)^2 + (y+2)^2 = r^2$
$(-1-7)^2 + (-6+2)^2 = r^2$ $\boxed{(x-7)^2 + (y+2)^2 = 80}$
$(-8)^2 + (-4)^2 = r^2$
$64 + 16 = 80$

Write an equation of a circle with center (−6, 8) and passes through the point (-2, 11)

$(x+6)^2 + (y-8)^2 =$
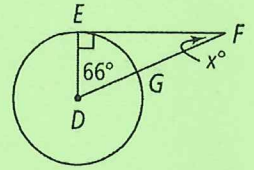$(-2+6)^2 + (11-8)^2 = r^2$
$4^2 + 3^2$
$16 + 9 = 25 = r^2$

$\boxed{(x+6)^2 + (y-8)^2 = 25}$

G22   **Practice QUIZ 10.6, 10.7, 12.1, 12.3, 12.5**   Name ANSWERS

OW ALL WORK _for all problems that require calculations._ _Follow directions carefully._ _Good Luck!_

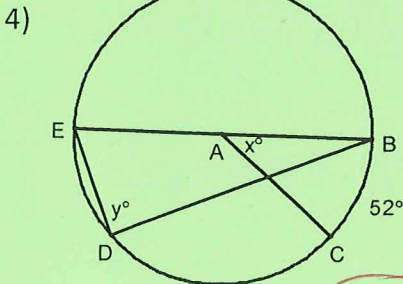1) Explain how you can tell from the diagram that segment EF is tangent to the circle.

_____ 90° angle _____

E
66°
G
D
F
x°

2) Find the value of x.   x = __24°__

**The circles are inscribed in polygons below. Find the perimeter of each polygon;**

3)

7   2
G
2 in.
5 in.   K
I
6 in.
5
6
H
11
8
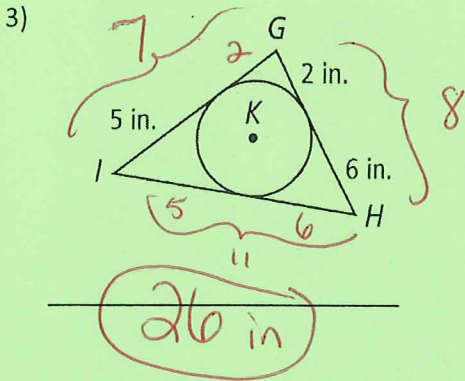
8 + 7 + 11 =

__(26 in)__

d the values of the missing variables;

4)

E
A x°
B
y°
D
C
52°

x = __(52°)__   y = __(90°)__

5)

k°
270°
j°

k = __(45°)__   j = $\frac{270}{2}$ = __(135°)__
     180 - 135

6)

94°
c°
56°
b°
a°

a = __(28°)__ b = __(47°)__ c = __(105°)__
    56/2   94/2   180 - 28 - 47

7)

14
x
20   10
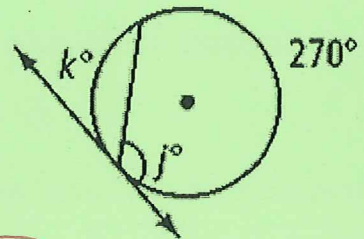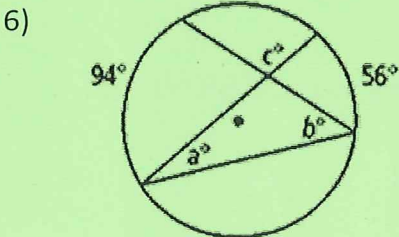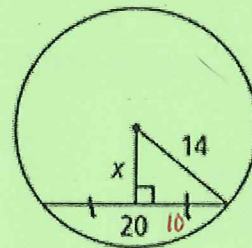
$10^2 + x^2 = 14^2$

$x^2 = 96$

x = __≈ 9.798__ or $\sqrt{96}$
    __(4√6)__   √16 √6

8)

78°

a°

a = **39°**

9)

86

a°

40°

172°
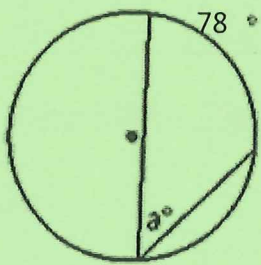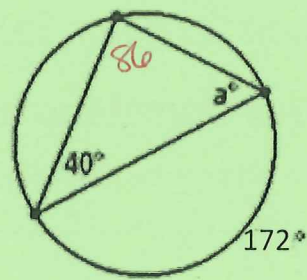
a = **54°**
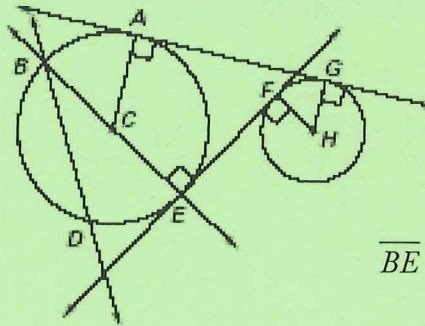
10) Use the diagram to the right, give the term that **best** describes the following: (the first letter of each correct answer is given)

a. ∡BCA is a C**entral** **angle**

b. $\overleftrightarrow{EF}$ is a T**angent** **line**

c. $\overline{HG}$ is a R **adius**

d. $\overarc{BAE}$ is a S **emicircle**

e. ∡DBE is an I**nscribed** **angle**

$\overline{BE}$ is a diameter

11) Write the standard form for the equation of a circle with the given center and radius.
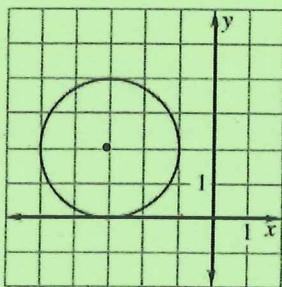   Center (3, -8) radius = 9

   $(x-3)^2 + (y+8)^2 = 81$

12) Given the equation of a circle, find the center and radius.

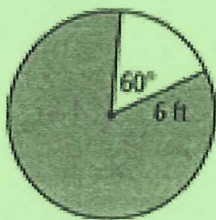 $(x - 7)^2 + y^2 = 625$ Center **(7, 0)**   radius = **25**

13) Given the graph of a circle, write the equation of the circle.

   Center **(-3, 2)**   radius = **2**

   Equation $(x+3)^2 + (y-2)^2 = 4$
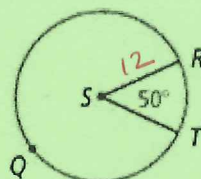
14) Find the area of the **shaded** sector;

   60°
   6 ft

   $\frac{A}{36\pi} = \frac{300}{360}$

   30π ft²

   ≈94.25 ft²

15) Find the length of arc RT in centimeters if SR = 12 cm

   12   R
   S   50°
   T
   Q

   $\frac{L}{24\pi} = \frac{50}{360}$

   3.3π cm

   ≈10.47 cm