Geometry
Ch. 10 CW-HW #7

Name: _____
Period: _____

For 1-5: Rewrite each circle in standard form by completing the square. State the center and radius and graph.

1) $x^2 + y^2 + 2x + 10y + 10 = 0$

$x^2 + 2x + \underline{1} + y^2 + 10y + \underline{25} = -10 + \underline{1} + \underline{25}$

$(x+1)^2 + (y+5)^2 = 16$

c $(-1, -5)$ r = 4

2) $x^2 + y^2 + 4x - 8y + 11 = 0$

$x^2 + 4x + \underline{4} + y^2 - 8y + \underline{16} = -11 + \underline{4} + \underline{16}$

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

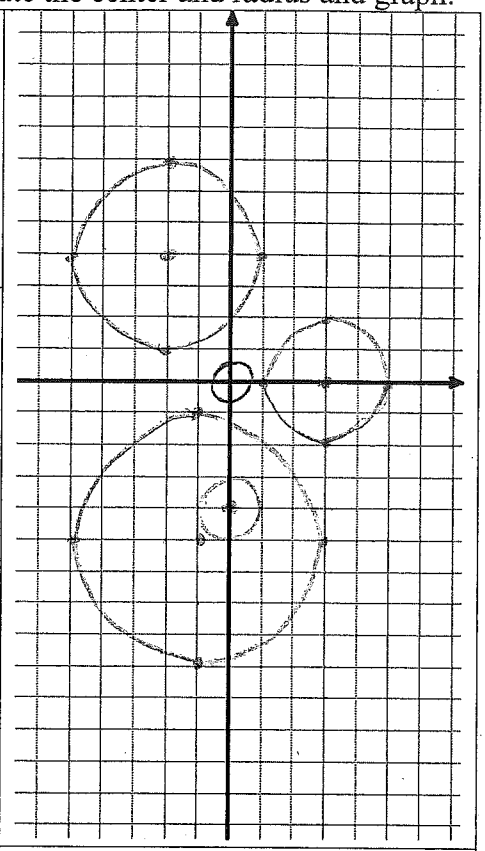
c $(-2, 4)$ r = 3

3) $x^2 + y^2 - 6x + 5 = 0$

$x^2 - 6x + \underline{9} + y^2 = -5 + \underline{9}$

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

c $(3, 0)$ r = 2



4) $x^2 + y^2 + 8y + 15 = 0$

$x^2 + y^2 + 8y + \underline{16} = -15 + \underline{16}$

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

c $(0, -4)$ r = 1

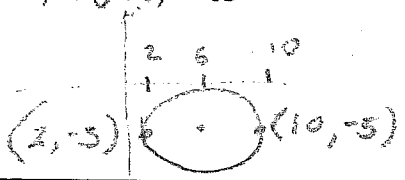
5) $x^2 + y^2 = \frac{1}{4}$ $\sqrt{\frac{1}{4}}$

c $(0, 0)$ $r = \frac{1}{2}$

6) In the $xy$-plane, the graph of the equation below is a circle. Point $P$ is on the circle and has coordinates $(10, -5)$. If $\overline{PQ}$ is a diameter of the circle, what are the coordinates of point $Q$?

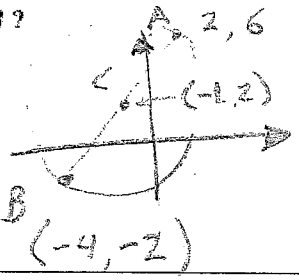
A) $(2, -5)$
B) $(6, -1)$
C) $(6, -5)$
D) $(6, -9)$

$(x-6)^2 + (y+5)^2 = 16$




7) A circle in the standard $(x,y)$ coordinate plane has center $C(-1,2)$ and passes through $A(2,6)$. Line segment $\overline{AB}$ is a diameter of this circle. What are the coordinates of point $B$?

F. $(-6, -2)$
G. $(-5, -1)$
H. $(-4, -2)$
J. $(4, 2)$
K. $(5, 10)$




8) $x^2 + y^2 + 4x - 2y = -1$

The equation of a circle in the $xy$-plane is shown above. What is the radius of the circle?

A) 2
B) 3
C) 4
D) 9

$x^2 + 4x + \underline{4} + y^2 - 2y + \underline{1} = -1 + 4 + 1$

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

r = 2

9) $x^2 + 20x + y^2 + 16y = -20$

The equation above defines a circle in the $xy$-plane. What are the coordinates of the center of the circle?

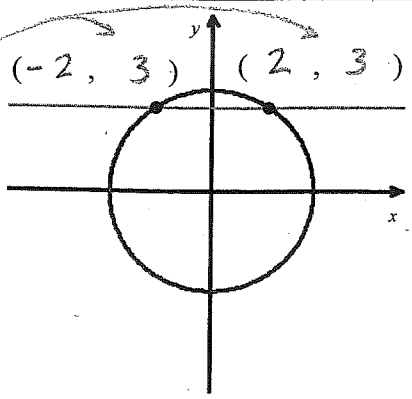
A) $(-20, -16)$
B) $(-10, -8)$
C) $(10, 8)$
D) $(20, 16)$

$x^2 + 20x + \underline{100} + y^2 + 16y + \underline{64} = -20 + 164$

$(x+10)^2 + (y+8)^2 = 144$

Solve the system by substitution and label the solutions on the graph.

10) $\begin{cases} x^2+y^2=13 \\ y=+3 \end{cases}$



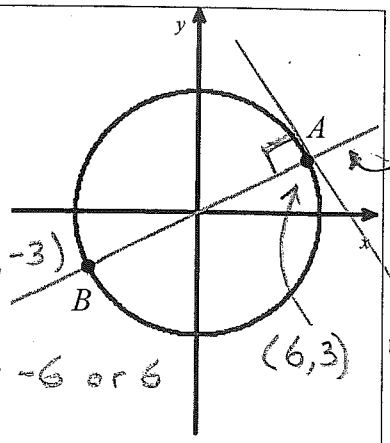

$x^2+(3)^2=13$

$x^2+9=13$

$x^2=4$

$x=-2$ or $2$

11) $\begin{cases} x^2+y^2=45 \\ x=2y \end{cases}$




$(2y)^2+y^2=45$

$4y^2+y^2=45$

$5y^2=45$

$y^2=9$

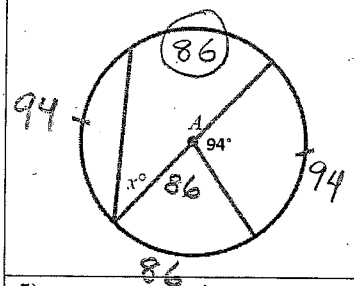
$y=-3$ or $3$ $\quad x=-6$ or $6$

Challenge: Find the equation of the line tangent to the circle at point A. $y-3=-2(x-6)$ / $y-3=-2x+12$ / $y=-2x+15$

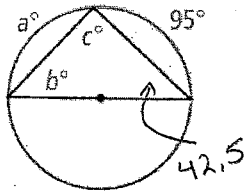
Optional Challenge: (check on Desmos) (A) $\begin{cases} x^2+y^2=34 \\ y=x+2 \end{cases}$ (B) $\begin{cases} x^2+y^2+2x+4y=20 \\ y=x-2 \end{cases}$

Find the indicated value.

1) $360-94-94-86$



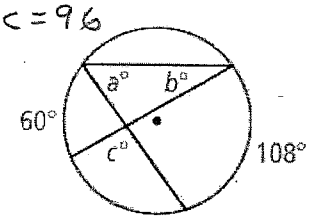

2) $c=90$ $\quad b=\frac{95}{2}=47.5$



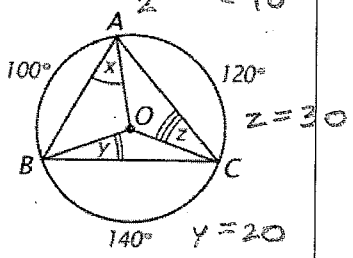

$a=85$

3) $a=54$ $\quad b=30$

$c=96$



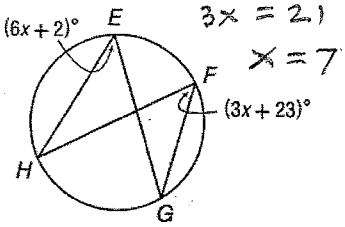

4) $x=\frac{180-100}{2}=40$




5) $6x+2=3x+23$

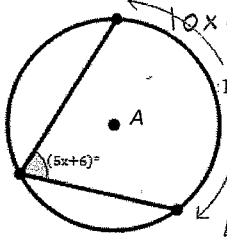
$3x=21$

$x=7$




6) $2(5x+6)=12x-14$

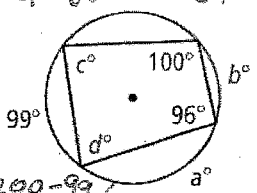
$10x+12=12x-14$




$26=2x$

$13=x$

7) $a=80$ $\quad c=84$



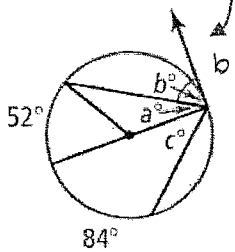

$a=200-99$

$=101$

$b=168-101$

$67$

8) tangent to O




$a=21$

$b=90-$

$=64$

$c=4$

Answers: 7, 13, 20, 26, 30, 40, 42, 43, 47.5, 54, 64, 67, 80, 84, 85, 90, 96, 101, 86, 30

Algebra Review: Simplify each expression:

9) $\frac{x^2-16x+64}{x^2-8x}$

$\frac{(x-8)(x-8)}{x(x-8)}=\frac{x-8}{x}$

10) $\frac{x^2-36}{x^2+12x+36}$

$\frac{(x+6)(x-6)}{(x+6)(x+6)}=\frac{x-6}{x+6}$

11) $\frac{12x^2+6x}{8x+4}$

$\frac{6x(2x+1)}{4(2x+1)}=\frac{6x}{4}=\frac{3x}{2}$

12) $\frac{8x^5y^{-6}}{12x^{-3}y^2}$

$\frac{2x^8y^{-8}}{3}=\frac{2x^8}{3y^8}$

13) $\left(3-\frac{5}{3}\right)^2$

$\left(\frac{9}{3}-\frac{5}{3}\right)^2$

$\left(\frac{4}{3}\right)^2=\frac{16}{9}$

14) $\left(\frac{\sqrt{3}}{2}\right)^2+\left(\frac{\sqrt{2}}{2}\right)^2$

$\frac{3}{4}+\frac{2}{4}=\frac{5}{4}$

15) $\frac{4}{1}\left(\frac{\sqrt{3}}{2}\right)+\frac{6}{1}\left(\frac{\sqrt{3}}{3}\right)$

$2\sqrt{3}+2\sqrt{3}$

$4\sqrt{3}$

16) $2\sqrt{27}+5\sqrt{12}$

$2\sqrt{9}\sqrt{3}+5\sqrt{4}\sqrt{3}$

$2\cdot3\sqrt{3}+5\cdot2\sqrt{3}$

$6\sqrt{3}+10\sqrt{3}$

$16\sqrt{3}$