9.1 Talking in Circles Practice WS

1) Find the center and radius of $(x+2)^2 + (y-5)^2 = 9$.

center $(-2, 5)$

radius $= 3$

2) Find the center and radius of $(x-2)^2 + (y+3)^2 = 16$.

center $(2, -3)$

radius $= 4$

For problems 3-9, write the equation for the circle with the given characteristics.

3) center $(2, 4)$ and radius 7 $(x-2)^2 + (y-4)^2 = 49$

4) center $\overset{h\ k}{(-3, 0)}$ and $\overset{x\ \ y}{(9, 2\sqrt{10})}$ as one endpoint of the diameter

$(x+3)^2 + (y-0)^2 = r^2$ → $184 = r^2$ $(x+3)^2 + y^2 = 184$

$(9+3)^2 + (2\sqrt{10})^2 = r^2$ $r = \sqrt{184}$
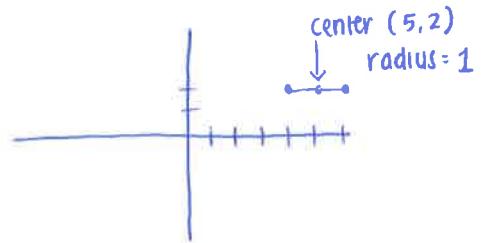
$(12)^2 + (4 \cdot 10) = r^2$ $r = \sqrt{4}\sqrt{46}$

$144 + 40 = r^2$ $r = 2\sqrt{46}$

5) endpoints of the diameter are $(4, 2)$ and $(6, 2)$

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

center $(5, 2)$
↓ radius $= 1$

6) endpoints of the diameter are $\overset{x\ y}{(-1, 2)}$ and $(5, 6)$

midpoint $= \left(\dfrac{-1+5}{2}, \dfrac{2+6}{2}\right) = \left(\dfrac{4}{2}, \dfrac{8}{2}\right) = \overset{h\ k}{(2, 4)}$ ← center

$(-1-2)^2 + (2-4)^2 = r^2$ → $9 + 4 = r^2$ $\boxed{(x-2)^2 + (y-4)^2 = 13}$

$(-3)^2 + (-2)^2 = r^2$ $13 = r^2$

$r = \sqrt{13}$
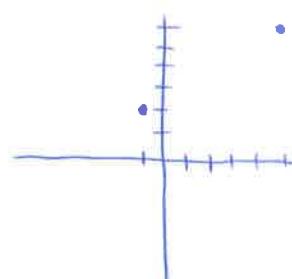
✗ 7) center $(7, 3)$ and tangent to the x-axis

radius $= 3$

$\boxed{(x-7)^2 + (y-3)^2 = 9}$

$r = 3$
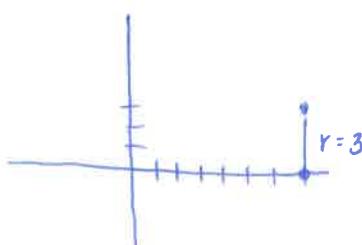
x 8) center $(7,3)$ and tangent to the y-axis

r = 7

$$\boxed{(x-7)^2 + (y-3)^2 = 49}$$

r = 7
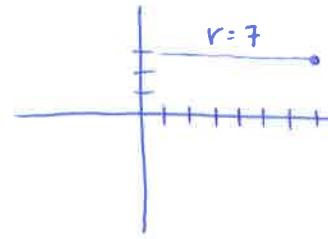
9) center $\overset{h\ K}{(7,-2)}$ and contains the point $\overset{x\ y}{(3,3)}$

$(x-7)^2 + (y+2)^2 = r^2$ → $r = \sqrt{41}$

$\boxed{(x-7)^2 + (y+2)^2 = 41}$

$(3-7)^2 + (3+2)^2 = r^2$

$(-4)^2 + (5)^2 = r^2$

$16 + 25 = r^2$

$41 = r^2$

10) Find the x- and y-intercepts of the graph of the circle given by the equations:

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

x-int: $(x-4)^2 + (0-2)^2 = 16$

$(x-4)^2 + 4 = 16$

$(x-4)^2 = 12$

$x - 4 = \pm\sqrt{12}$

$x = 4 \pm \sqrt{12}$

$x \approx 7.46, \ x \approx 0.54$

$\boxed{(7.46, 0)}$
$\boxed{(0.54, 0)}$

y-int: $(0-4)^2 + (y-2)^2 = 16$

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

$(y-2)^2 = 0$

$y = 2$

$\boxed{(0,2)}$

b. $(x+5)^2 + (y-4)^2 = 25$

x-int: $(0+5)^2 + (y-4)^2 = 25$

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

$(y-4)^2 = 0$

$y = 4$

$\boxed{(0,4)}$

y-int: $(x+5)^2 + (0-4)^2 = 25$

$(x+5)^2 + 16 = 25$

$(x+5)^2 = 9$

$x + 5 = \pm 3$

$x = \pm 3 - 5$

$x = 3 - 5 \qquad x = -3 - 5$

$x = -2 \qquad x = -8$

$\boxed{(-2,0) \qquad (-8,0)}$