10.8 Equations of Circles

Center: (h,k)

Basic Equation:

$$(x-h)^2+(y-k)^2=r^2$$ r = radius

Ex1 **Identify the center and radius of the circle.**

$(x+4)^2+y^2=32$

$(x--4)^2+(y-0)^2=32$

Center: $(-4,0)$

radius $=\sqrt{32}=4\sqrt{2}$

Ex2 **Write an equation for the circle.**

a). Center at (0,0) diameter =18 $\Rightarrow r=9$

$(x-0)^2+(y-0)^2=9^2$

$\boxed{x^2+y^2=81}$

b). diameter has endpoints (2,7) and (-6,15)

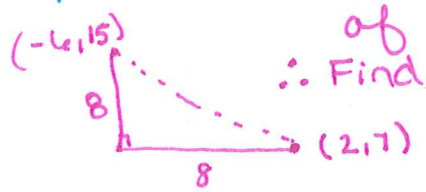
Find Center: midpoint of the diameter

$\left(\frac{2+-6}{2},\frac{7+15}{2}\right)$

$\boxed{C=(-2,11)}$ h k

Find radius $=\frac{1}{2}$ length of diameter

∴ Find diameter



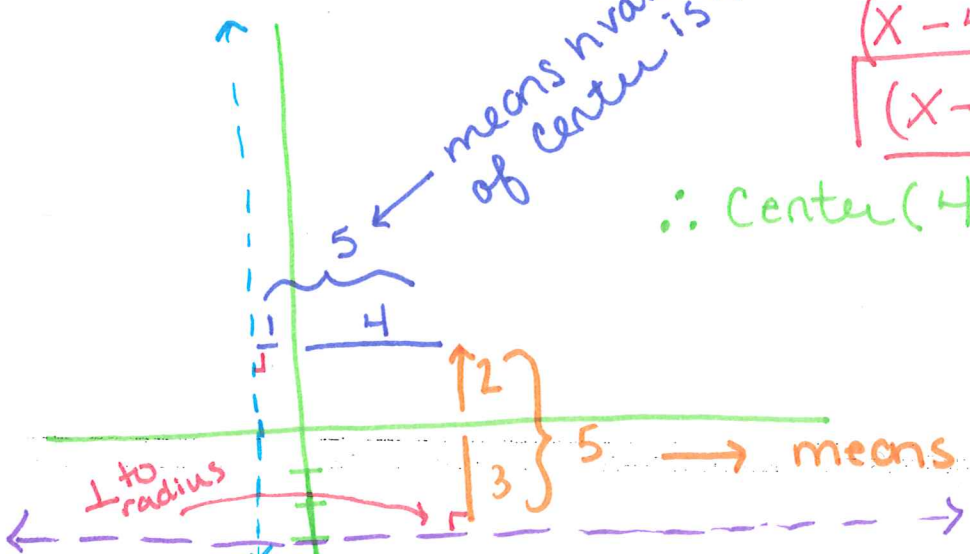
$d=8\sqrt{2}\Rightarrow r=4\sqrt{2}$

$(x--2)^2+(y-11)^2=(4\sqrt{2})^2$ 16·2

$\boxed{(x+2)^2+(y-11)^2=32}$

c). A circle with diameter 10, has its center in the 1st quadrant. The lines $y=-3$ and $x=-1$ are tangent to the circle.

$r=5$



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

$\boxed{(x-4)^2+(y-2)^2=25}$

∴ Center $(4,2)$

→ means y value of center is 2

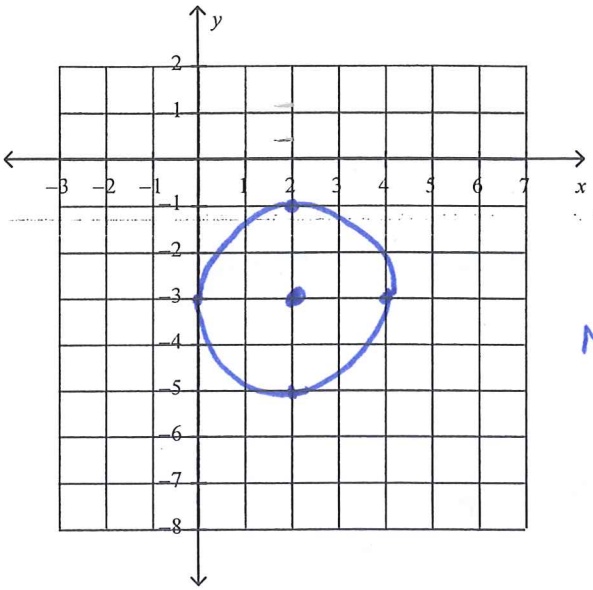
Ex3 Graph the equation.

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

center = $(2,-3)$

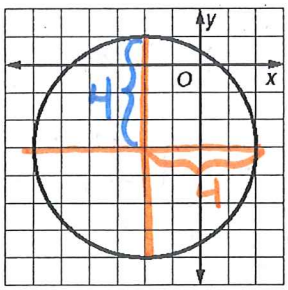
$r = 2$

NOT 4!!



Must show 5pts!

Ex4 Write the equation of the circle.



radius = 4 units

center $(-2,-3)$

$(x+2)^2 + (y+9)^2 = 16$