# 9.10 Notes / Practice

- Convert from Standard to general Form. ↳ $(x-h)^2+(y-k)^2=r^2$

Ex: $(x-2)^2+(y+6)^2=25$

① Expand the equation $\quad (x-2)(x-2)+(y+6)(y+6)=25$

② Distribute $\quad x^2-2x-2x+4+y^2+6y+6y+36=25$

③ Combine like terms & re-order x's & y's $\quad x^2+y^2-4x+12y+40=25$

$$-25 \quad -25$$

④ Set equation equal to 0. $\quad \boxed{x^2+y^2-4x+12y+15=0}$

Ex:

$(x+5)^2+y^2=27$

$(x+5)(x+5)+y^2=27$

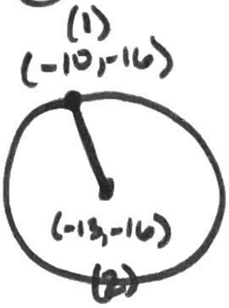
$x^2+5x+5x+25+y^2=27$

$x^2+y^2+10x+25=27$

$$-27 \quad -27$$

$\boxed{x^2+y^2+10x-2=0}$

① Center: $(-13,-16)$ & a point on the circle at $(-10,-16)$.




*use the distance formula to find the length of the radius.

$$d=\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$$

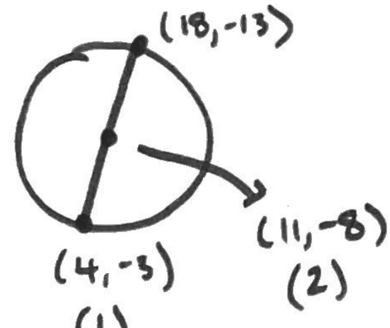
$$d=\sqrt{(-13+10)^2+(-16+16)^2}$$

$$d=\sqrt{9+0}=d=\sqrt{9}=3$$

radius

$$\boxed{(x+13)^2+(y+16)^2=9}$$

② Ends of the diameter are $(18,-13)$ & $(4,-3)$.




• To find center, use the midpoint formula w/ the endpoints of the diameter.

$$\left(\frac{x_2+x_1}{2},\frac{y_2+y_1}{2}\right)\Rightarrow\left(\frac{18+4}{2},\frac{-13+-3}{2}\right)\Rightarrow(11,-8)$$

CENTER

• Use distance formula to find the radius. You can use center & one endpoint OR find distance of diameter & ÷2.

$$\boxed{(x-11)^2+(y+8)^2=74}$$

$$d=\sqrt{(11-4)^2+(-8+3)^2}$$

$$d=\sqrt{49+25} \qquad r=\sqrt{74}$$

$$d=\sqrt{74}$$

11) Ends of the diameter are (18, −13) and (4, −3)

12) Center: (0, 13) & Area of $25\pi$

$a = \pi r^2$

$\frac{25\pi}{\pi} = \frac{\pi r^2}{\pi}$

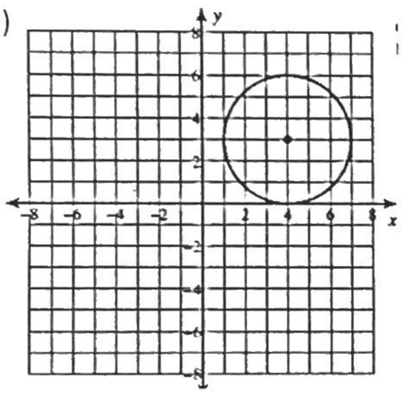
$\sqrt{25} = \sqrt{r^2}$

$5 = r$

13) Ends of Diameter are (0, 0) & (0, 6)

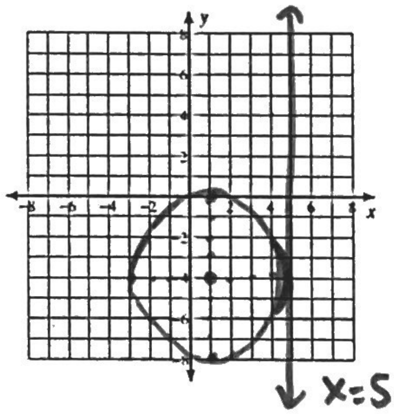
14) Center: (3, 1) & Circumference of $10\pi$

15)



16) Center (1, −4) & Tangent to x = 5

vertical line

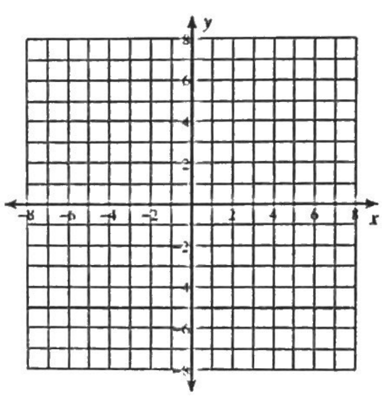



$r = 4$

$(x-1)^2 + (y+4)^2 = 16$

17) Center: (0, 0) & Tangent to y = −3

horizontal line



18) Inscribed in the system of
y = 3, y = 7, x = 1, & x = 5