

C.A.T.  
Circles Worksheet

Name: Key  
Date: \_\_\_\_\_ Per: \_\_\_\_\_

Write the equation for each circle described.

- Center (0,0) and radius 2
- Center (0,0) and passing through (4,5)

- $x^2 + y^2 = 4$
- $x^2 + y^2 = 41$

$r = \sqrt{5}$   
 $r^2 = (\sqrt{5})^2$

- Center (2,-3) and passing through (4,1)

$h k$   $x y$   
 $\sqrt{(4-2)^2 + (1-(-3))^2}$   
 $\sqrt{2^2 + 4^2}$   $\sqrt{20}$

- $(x-2)^2 + (y+3)^2 = 20$

- Diameter has endpoints at (3,4) and (-1,2)

$\frac{3+(-1)}{2}$   $\frac{4+2}{2}$   
 $(1, 3)$   $\sqrt{(3-(-1))^2 + (4-2)^2}$   
 $\sqrt{16+4} = \sqrt{20}$

- $(x-1)^2 + (y-3)^2 = 5$

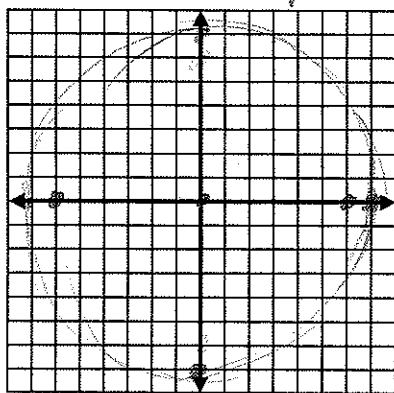
$r = \frac{\sqrt{20}}{2}$

$\frac{\sqrt{20} \cdot \sqrt{10} \cdot 20}{2 \cdot 2 \cdot 4}$

Determine the center and radius of each circle and sketch its graph.

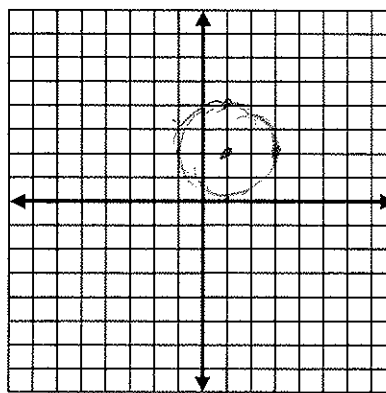
- $x^2 + y^2 = 49$

C: (0,0) r = 7



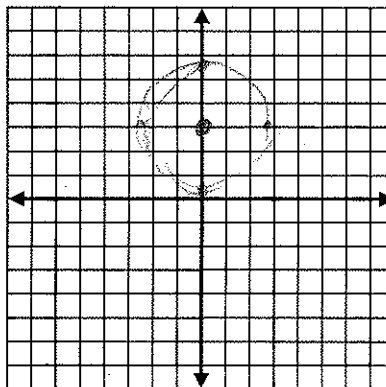
- $(x-1)^2 + (y-2)^2 = 4$

C: (1,2) r = 2



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

C: (0,3) r =  $\sqrt{8} \approx 2.8$



Determine the center and radius of each circle.

$$\left(\frac{b}{2}\right)^2$$

8.  $x^2 + y^2 + 2y = 8$

$$x^2 + \boxed{y^2 + 2y + 1} = 8 + 1$$

8. Eqn:  $x^2 + (y+1)^2 = 9$

c:  $(0, -1)$  r =  $3$

9.  $x^2 + 8x + y^2 = 10y$

$$(x+4)^2 + (y-5)^2 = 41$$

$$\left(\frac{8}{2}\right)^2 x^2 + 8x + \underline{16} + y^2 - 10y + \underline{25} = 0 + 16 + 25$$

9. Eqn:  $(x+4)^2 + (y-5)^2 = 41$

c:  $(-4, 5)$  r =  $\sqrt{41}$

10.  $x^2 - x + y^2 + y = \frac{1}{2} + \frac{1}{4} + \frac{1}{4}$

$$\left(x - \frac{1}{2}\right)^2 + \left(y + \frac{1}{2}\right)^2 = 1$$

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

10. Eqn:  $\left(x - \frac{1}{2}\right)^2 + \left(y + \frac{1}{2}\right)^2 = 1$

c:  $\left(\frac{1}{2}, -\frac{1}{2}\right)$  r =  $1$

11.  $x^2 + \frac{2}{3}x + y^2 + \frac{1}{3}y = \frac{1}{9} + \frac{1}{9} + \frac{1}{36}$

$$\left(x + \frac{1}{3}\right)^2 + \left(y + \frac{1}{6}\right)^2 = \frac{9}{36}$$

11. Eqn:  $\left(x + \frac{1}{3}\right)^2 + \left(y + \frac{1}{6}\right)^2 = \frac{9}{36}$

c:  $\left(-\frac{1}{3}, -\frac{1}{6}\right)$  r =  $\frac{1}{2}$