

Name: \_\_\_\_\_

*Key*

Date: \_\_\_\_\_

**Is the Point On, Inside, Outside of the Circle?**

1. A circular skylight has a diameter with endpoints at (-6, 32) and (2, 26). Find the center and radius of the skylight.

$$C = \left( \frac{-6+2}{2}, \frac{32+26}{2} \right) = (-2, 29)$$

$$r = d = \sqrt{(-2 - (-6))^2 + (29 - 32)^2}$$

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

$$r = 5$$

2. A circle has its center at (1, 2) and point A(1, 5) is on the circle. Is point B(4,2) on, inside or outside the circle?

$$r = d = \sqrt{(1-1)^2 + (5-2)^2}$$

$$= \sqrt{0 + 3^2} \quad r = 3$$

ON

$$d = \sqrt{(4-1)^2 + (2-2)^2}$$

$$= \sqrt{3^2 + 0^2}$$

$$r = 3$$

3. The circle has its center at (1, 1) and point C(-4, 1) is on the circle. Is point D(4, 5) on, inside or outside the circle?

$$d = \sqrt{(-4-1)^2 + (1-1)^2}$$

$$= \sqrt{(-5)^2 + 0^2}$$

$$r = 5$$

ON

$$d = \sqrt{(4-1)^2 + (5-1)^2}$$

$$= \sqrt{3^2 + 4^2}$$

$$= 5$$

4. Circle E has a center at (-5, -6) and its radius is  $2\sqrt{3}$ . Is point F(-8, -4) on, inside, or outside the circle? Show your work to justify your answer.

$$r = 2\sqrt{3} \approx 3.46$$

$$d = \sqrt{(-8 - (-5))^2 + (-4 - (-6))^2}$$

$$= \sqrt{(-3)^2 + (2)^2} = \sqrt{13} \approx 3.6$$

$3.6 > 3.46 = r$   
F is outside circle E

Determine whether Point A lies on, inside, or outside the circle whose center is Point C and which contains the Point P. Justify your answer mathematically.

A is inside

5. A(-2, -1); Center C(-5, 4); contains Point P(3, 2)

$$CP = \sqrt{(3 - (-5))^2 + (2 - 4)^2}$$

$$CP = \sqrt{64 + 4} = 8.25$$

$$CA = \sqrt{(-2 - (-5))^2 + (4 - (-1))^2}$$

$$= \sqrt{3^2 + 5^2}$$

$$CA = 5.83$$

6. A(-5, 13); Center C(3, 7); contains Point P(-3, -1)

$$CP = \sqrt{(-3 - 3)^2 + (-1 - 7)^2}$$

$$= \sqrt{(-6)^2 + (-8)^2} = \sqrt{100}$$

CA = 10  
CP = 10

$$CA = \sqrt{(-5 - 3)^2 + (13 - 7)^2}$$

$$= \sqrt{(-8)^2 + (6)^2}$$

$$= \sqrt{100} = 10$$

A is ON the circle

7. A(-4, -6); Center C(-1, -1); contains Point P(3, 2)

$$CP = \sqrt{(3 - (-1))^2 + (2 - (-1))^2}$$

$$= \sqrt{4^2 + 3^2} = 5$$

CP = 5  
CA = 5.83

$$CA = \sqrt{(-4 - (-1))^2 + (-6 - (-1))^2}$$

$$= \sqrt{-3^2 + -5^2}$$

$$= 5.83$$

CA is OUTSIDE the circle

7.6 BACK OF NOTES

Use the information provided to write the standard form equation of each circle.

1)  $x^2 + y^2 - 6x + 30y + 230 = 0$

$$(x-3)^2 + (y+15)^2 = 4$$

3) Center:  $(-12, 4)$   
Circumference:  $10\pi$

2)  $x^2 + y^2 + 6x - 18y + 41 = 0$

$$(x+3)^2 + (y-9)^2 = 49$$

4) Center:  $(-1, 11)$   
Area:  $9\pi$

$$(x+12)^2 + (y-4)^2 = 25$$

5) Center:  $(-13, 8)$   
Point on Circle:  $(-12, 6)$

$$(x+1)^2 + (y-11)^2 = 9$$

6) Center:  $(-9, -11)$   
Point on Circle:  $(-10, -8)$

$$(x+13)^2 + (y-8)^2 = 5$$

$$(x+9)^2 + (y+11)^2 = 10$$

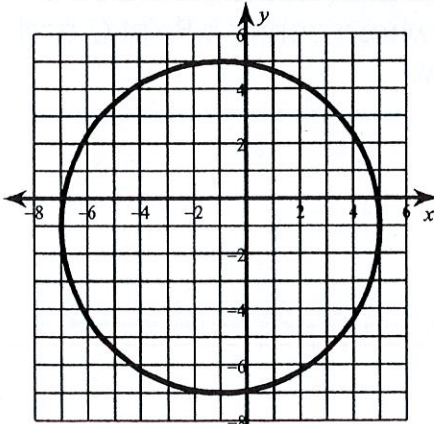
7) Ends of a diameter:  $(-3, 12)$  and  $(-11, 0)$

8) Ends of a diameter:  $(-1, -18)$  and  $(7, -4)$

$$(x+7)^2 + (y-6)^2 = 52$$

$$(x-3)^2 + (y+11)^2 = 65$$

9)



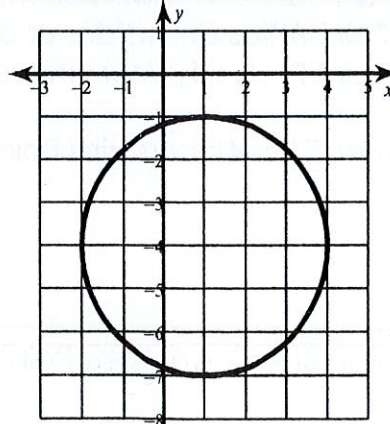
$$(x+1)^2 + (y+1)^2 = 36$$

Use the information provided to write the general conic form equation of each circle.

11)  $(x-14)^2 + (y-1)^2 = 4$

$$x^2 + y^2 - 28x - 2y + 193 = 0$$

10)



$$(x-1)^2 + (y+4)^2 = 9$$

12)  $(x+6)^2 + (y+5)^2 = 121$

$$x^2 + y^2 + 12x + 10y - 60 = 0$$