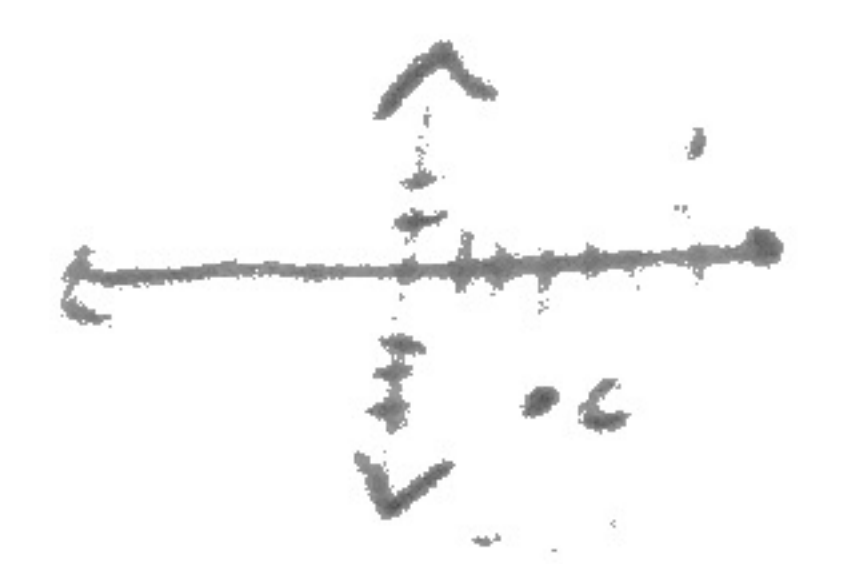


Circles Worksheet Day #1

Write an equation of a circle given the following information.

	Center	Radius	Equation
1.	(2, -4)	4	$(x-2)^2 + (y+4)^2 = 16$
2.	(-7, 1)	15	$(x+7)^2 + (y-1)^2 = 225$
3.	(3, 0)	1/3	$(x-3)^2 + y^2 = \frac{1}{9}$
4.	(-5, -3)	$3\sqrt{2}$	$(x+5)^2 + (y+3)^2 = 18$

Write an equation of each circle described below. Show work!

5. Given a circle with center (3, -4) and passing through (6, 2). Find $r = \sqrt{(6-3)^2 + (-4-2)^2} = \sqrt{3^2 + 6^2} = \sqrt{9+36} = \sqrt{45}$
- $(x-3)^2 + (y+4)^2 = 45$
- 

6. Given a circle with the center (5, 1) and a point on the circle (8, -2). $r = \sqrt{(8-5)^2 + (-2-1)^2} = \sqrt{3^2 + (-3)^2} = \sqrt{9+9} = \sqrt{18}$
- $(x-5)^2 + (y-1)^2 = 18$

7. Given a circle with the center at the origin and passing through (4, 3). $r = \sqrt{4^2 + 3^2} = \sqrt{16+9} = \sqrt{25} = 5$
- $x^2 + y^2 = 25$

Extension (Hint: find the coordinates of the center first)

8. Given a circle with (5, 1) and (3, -1) as the endpoints of the diameter.

$M = \left(\frac{5+3}{2}, \frac{1+(-1)}{2}\right) = (4, 0)$

$r = \sqrt{(5-4)^2 + (1-0)^2} = \sqrt{1+1} = \sqrt{2}$

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

9. Given a circle with (2, 1) and (6, -3) as the endpoints of the diameter.

$M = \left(\frac{2+6}{2}, \frac{1+(-3)}{2}\right) = (4, -1)$

$r = \sqrt{(6-4)^2 + (-3-1)^2} = \sqrt{2^2 + (-4)^2} = \sqrt{4+16} = \sqrt{20} = 2\sqrt{5}$

$(x-4)^2 + (y+1)^2 = 20$

10. Given a circle with (4, -3) and (2, 1) as the endpoints of the diameter.

$M = \left(\frac{4+2}{2}, \frac{-3+1}{2}\right) = (3, -1)$

$r = \sqrt{(4-3)^2 + (-3-1)^2} = \sqrt{1+16} = \sqrt{17}$

$(x-3)^2 + (y+1)^2 = 17$

Circles - Notes Day 1

General Form of the Equation of a Circle:

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

Center: (h, k) and radius = $\sqrt{r^2}$

Given the center and radius, write the equation.

1. $C(5, 2)$ $r = 7$

$$(x - 5)^2 + (y - 2)^2 = 7^2$$

Equation: $(x - 5)^2 + (y - 2)^2 = 49$

2. $C(-3, 4)$ $r = 2\sqrt{5}$

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

$= 4(5)$
 $= 20$

Equation: $(x + 3)^2 + (y - 4)^2 = 20$

Given the center and another point on the circle, write the equation.

To find r^2 either plug in the point or use the distance formula, $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$.

3. $C(4, -7)$ and $(5, 3)$

$$(x - 4)^2 + (y + 7)^2 = r^2$$

Equation: $(x - 4)^2 + (y + 7)^2 = 101$

Find r^2 by plugging in the point $(5, 3)$:

$$(x - 4)^2 + (y + 7)^2 = r^2$$

$$(5 - 4)^2 + (3 + 7)^2 = r^2$$

$$(1)^2 + (10)^2 = r^2$$

$$101 = r^2$$

4. C origin and $(-5, 2)$

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

Equation: $x^2 + y^2 = 29$

Find r^2 using the distance formula:

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

$$d = \sqrt{25 + 4}$$

$$d = \sqrt{29}$$