

1. Write the equation of the circle that satisfies each set of conditions.

1. Center (0, 3), radius is 7 units
 $(x-0)^2 + (y-3)^2 = 49$ or $x^2 + (y-3)^2 = 49$

2. Center (-8, 7), radius is $\frac{1}{2}$ units
 $(x+8)^2 + (y-7)^2 = \frac{1}{4}$

3. Center (-1, -5), radius is 2 units.
 $(x+1)^2 + (y+5)^2 = 4$

II. Find the center and radius of the circle with the given equation.

4. $x^2 + (y+2)^2 = 4$
 Center (0, -2) =
 $r = 2$

5. $x^2 + y^2 = 144$
 Center (0, 0)
 $r = 12$

6. $(x-3)^2 + (y-1)^2 = 25$
 Center (3, 1)
 $r = 5$

7. $(x+3)^2 + (y+7)^2 = 81$
 Center (-3, -7)
 $r = 9$

8. $(x-3)^2 + y^2 = 16$
 Center (3, 0)
 $r = 4$

9. $x^2 + y^2 + 6y = -50 - 14x$
 $x^2 + 14x + y^2 + 6y = -50$
 $(x+7)^2 + (y+3)^2 = 10$
 Center (-7, -3) $r = \sqrt{10}$

10. $x^2 + y^2 + 2x - 10 = 0$
 $x^2 + 2x + y^2 = 10$
 $(x+1)^2 + (y+0)^2 = 11$
 Center (-1, 0) $r = \sqrt{11}$

11. $x^2 + y^2 - 18x - 18y + 53 = 0$
 $x^2 - 18x + y^2 - 18y = -53$
 $(x-9)^2 + (y-9)^2 = 109$
 Center (9, 9) $r = \sqrt{109}$

12. $x^2 + y^2 + 2x + 4y = 9$
 $x^2 + 2x + y^2 + 4y = 9$
 $(x+1)^2 + (y+2)^2 = 14$
 Center (-1, -2) $r = \sqrt{14}$

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Equations of Circles Worksheet 2

Honors

Write the equation of the circle that satisfies each set of conditions.

1. Endpoints of a diameter at (-5, 2) and (3, 6)

Center $(\frac{-5+3}{2}, \frac{2+6}{2}) = (\frac{-2}{2}, \frac{8}{2}) = (-1, 4)$

Diameter $\sqrt{(3-(-5))^2 + (6-2)^2} = \sqrt{64+16} = \sqrt{80}$ $r = \frac{\sqrt{80}}{2}$
 $(x+1)^2 + (y-4)^2 = \frac{80}{4}$

2. Endpoints of a diameter at (11, 18) and (-13, -19)

Center $(\frac{11+(-13)}{2}, \frac{18+(-19)}{2}) = (\frac{-2}{2}, \frac{-1}{2}) = (-1, -\frac{1}{2})$
 $(x+1)^2 + (y-\frac{1}{2})^2 = 20$

$D = \sqrt{(13-11)^2 + (-19-18)^2} = \sqrt{4+724} = \sqrt{728}$
 $r = \frac{\sqrt{728}}{2}$
 $(x+1)^2 + (y-\frac{1}{2})^2 = \frac{728}{4}$

3. Center at (8, -9), passes through (21, 22)

Center (8, -9)
 Distance = $\sqrt{(21-8)^2 + (22-(-9))^2} = \sqrt{13^2 + 31^2} = \sqrt{1190}$
 $(y-8)^2 + (y+9)^2 = 1190$

4. Center at (-8, -7), tangent to y-axis

Center (-8, -7)
 $(x+8)^2 + (y+7)^2 = 64$

5. Center at (4, 2), tangent to the x-axis

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

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