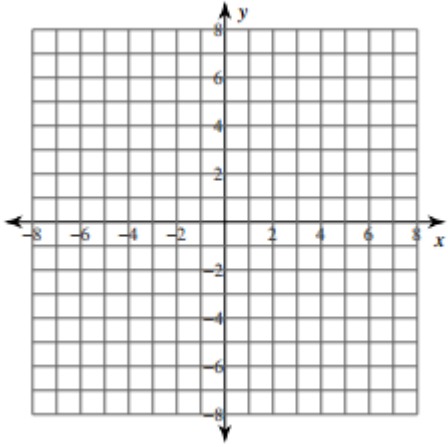
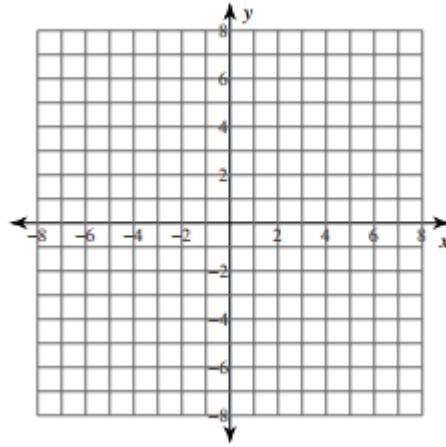


Identify the center and radius of each. Then sketch the graph.

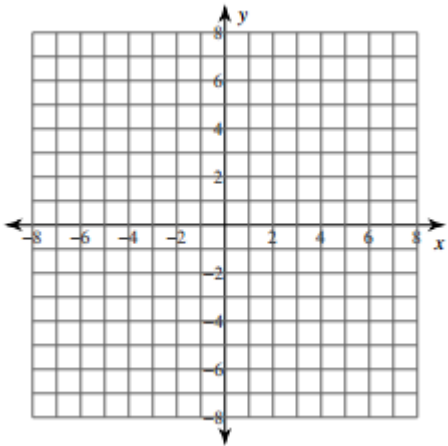
CP 1.  $(x - 1)^2 + (y + 3)^2 = 4$



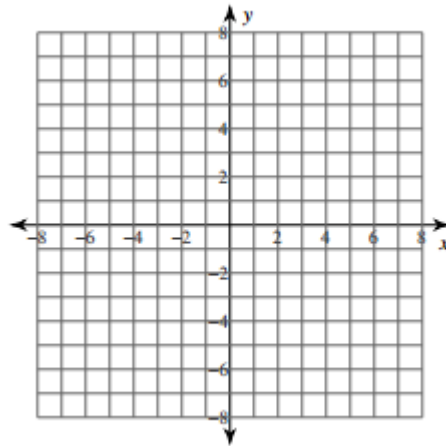
HN 2.  $x^2 + (y - 3)^2 = 16$



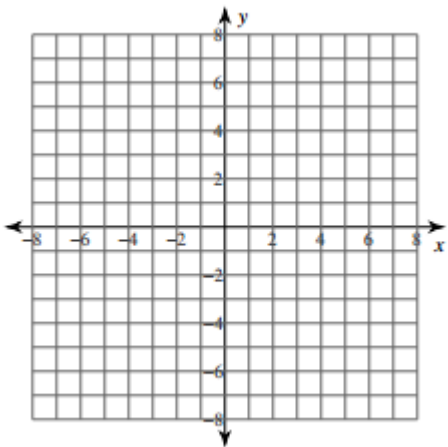
HN 3.  $9 = 2y - y^2 - 6x - x^2$



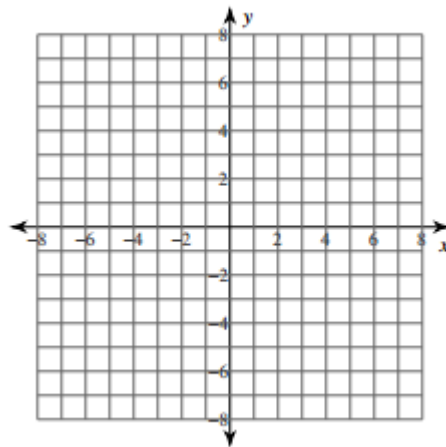
ALL 4.  $y^2 + 4x - 20 - 2y = -x^2$



CP 5.  $-9 = -y^2 - x^2$



ALL 6.  $16 + x^2 + y^2 - 8x - 6y = 0$



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

ALL 7. Center: (13, -13)  
Radius: 4

ALL 8. Center: (-2, 5)  
Point on Circle: (-8, 11)

CP 9. Ends of a diameter: (18, -13) and (4, -3)

ALL 10. Center: (0, 13)  
Area:  $25\pi$

ALL 11. Center: (-4, -3)  
Point on Circle: (2, 2)

HN 12. Ends of a diameter: (6, 7) and (-5, -8)

ALL 13. Center: (-10, 6)  
Area:  $49\pi$

ALL 14. Center: (12, 7)  
Circumference:  $10\pi$