10.1 Exercise Set

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Concept Reinforcement *In each of Exercises 1–8, match the equation with the center or vertex of its graph, listed in the column on the right.*

1. (f) $(x-2)^2+(y+5)^2=9$
2. (e) $(x+2)^2+(y-5)^2=9$
3. (g) $(x-5)^2+(y+2)^2=9$
4. (h) $(x+5)^2+(y-2)^2=9$
5. (c) $y=(x-2)^2-5$
6. (b) $y=(x-5)^2-2$
7. (d) $x=(y-2)^2-5$
8. (a) $x=(y-5)^2-2$

a) Vertex: $(-2,5)$
b) Vertex: $(5,-2)$
c) Vertex: $(2,-5)$
d) Vertex: $(-5,2)$
e) Center: $(-2,5)$
f) Center: $(2,-5)$
g) Center: $(5,-2)$
h) Center: $(-5,2)$

Graph. Be sure to label each vertex.

9. $y=-x^2$ ⊡
10. $y=2x^2$ ⊡
11. $y=-x^2+4x-5$ ⊡
12. $x=4-3y-y^2$ ⊡
13. $x=y^2-4y+2$ ⊡
14. $y=x^2+2x+3$ ⊡
15. $x=y^2+3$ ⊡
16. $x=-y^2$ ⊡
17. $x=2y^2$ ⊡
18. $x=y^2-1$ ⊡
19. $x=-y^2-4y$ ⊡
20. $x=y^2+3y$ ⊡
21. $y=x^2-2x+1$ ⊡
22. $y=x^2+2x+1$ ⊡
23. $x=-\frac{1}{2}y^2$ ⊡
24. $y=-\frac{1}{2}x^2$ ⊡
25. $x=-y^2+2y-1$ ⊡
26. $x=-y^2-2y+3$ ⊡
27. $x=-2y^2-4y+1$ ⊡
28. $x=2y^2+4y-1$ ⊡

Find an equation of the circle satisfying the given conditions.

29. Center $(0,0)$, radius 6 $x^2+y^2=36$
30. Center $(0,0)$, radius 5 $x^2+y^2=25$
31. Center $(7,3)$, radius $\sqrt{5}$ $(x-7)^2+(y-3)^2=5$
32. Center $(5,6)$, radius $\sqrt{2}$ $(x-5)^2+(y-6)^2=2$
33. Center $(-4,3)$, radius $4\sqrt{3}$ $(x+4)^2+(y-3)^2=48$
34. Center $(-2,7)$, radius $2\sqrt{5}$ $(x+2)^2+(y-7)^2=20$
35. Center $(-7,-2)$, radius $5\sqrt{2}$ $(x+7)^2+(y+2)^2=50$
36. Center $(-5,-8)$, radius $3\sqrt{2}$ $(x+5)^2+(y+8)^2=18$
37. Aha! Center $(0,0)$, passing through $(-3,4)$ $x^2+y^2=25$
38. Center $(0,0)$, passing through $(11,-10)$ $x^2+y^2=221$
39. Center $(-4,1)$, passing through $(-2,5)$ $(x+4)^2+(y-1)^2=20$
40. Center $(-1,-3)$, passing through $(-4,2)$ $(x+1)^2+(y+3)^2=34$

Find the center and the radius of each circle. Then graph the circle.

41. $x^2+y^2=64$ ⊡
42. $x^2+y^2=36$ ⊡
43. $(x+1)^2+(y+3)^2=36$ ⊡
44. $(x-2)^2+(y+3)^2=4$ ⊡
45. $(x-4)^2+(y+3)^2=10$ ⊡
46. $(x+5)^2+(y-1)^2=15$ ⊡
47. $x^2+y^2=10$ ⊡
48. $x^2+y^2=7$ ⊡
49. $(x-5)^2+y^2=\frac{1}{4}$ ⊡
50. $x^2+(y-1)^2=\frac{1}{25}$ ⊡
51. $x^2+y^2+8x-6y-15=0$ ⊡
52. $x^2+y^2+6x-4y-15=0$ ⊡
53. $x^2+y^2-8x+2y+13=0$ ⊡
54. $x^2+y^2+6x+4y+12=0$ ⊡
55. $x^2+y^2+10y-75=0$ ⊡
56. $x^2+y^2-8x-84=0$ ⊡
57. $x^2+y^2+7x-3y-10=0$ ⊡
58. $x^2+y^2-21x-33y+17=0$ ⊡
59. $36x^2+36y^2=1$ ⊡
60. $4x^2+4y^2=1$ ⊡

⊡ Answers to Exercises 9–28 and 41–60 are on pp. IA-27 and IA-28.