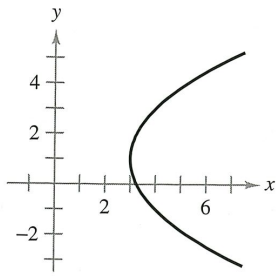
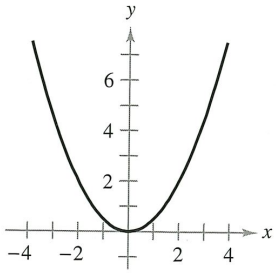
In Exercises 1–6, match the equation with its graph. [The graphs are labeled (a) through (f).]

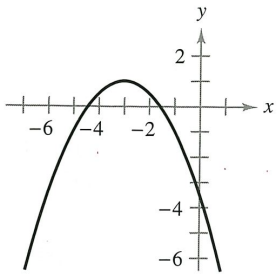
(a)



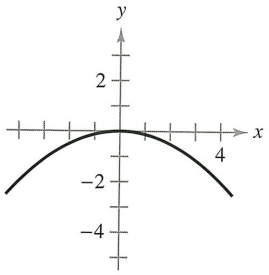
(b)



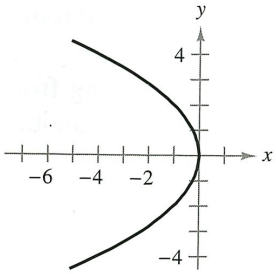
(c)



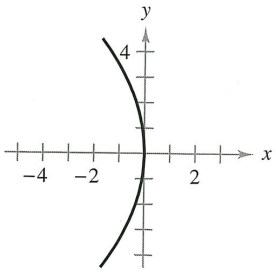
(d)



(e)



(f)



1. $y^2 = -4x$
2. $x^2 = 2y$
3. $x^2 = -8y$
4. $y^2 = -12x$
5. $(y - 1)^2 = 4(x - 3)$
6. $(x + 3)^2 = -2(y - 1)$

In Exercises 7–20, find the vertex, focus, and directrix of the parabola and sketch its graph.

7. $y = \frac{1}{2}x^2$
8. $y = -2x^2$
9. $y^2 = -6x$
10. $y^2 = 3x$
11. $x^2 + 6y = 0$
12. $x + y^2 = 0$
13. $(x - 1)^2 + 8(y + 2) = 0$
14. $(x + 5) + (y - 1)^2 = 0$
15. $\left(x + \frac{3}{2}\right)^2 = 4(y - 2)$
16. $\left(x + \frac{1}{2}\right)^2 = 4(y - 1)$
17. $y = \frac{1}{4}(x^2 - 2x + 5)$
18. $x = \frac{1}{4}(y^2 + 2y + 33)$
19. $y^2 + 6y + 8x + 25 = 0$
20. $y^2 - 4y - 4x = 0$

In Exercises 21–24, find the vertex, focus, and directrix of the parabola. Use a graphing utility to graph the parabola.

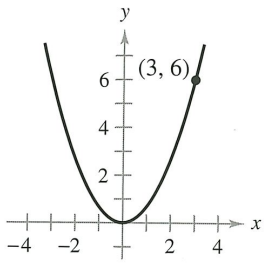
21. $x^2 + 4x + 6y - 2 = 0$
22. $x^2 - 2x + 8y + 9 = 0$
23. $y^2 + x + y = 0$
24. $y^2 - 4x - 4 = 0$

In Exercises 25 and 26, the equations of a parabola and a tangent line to the parabola are given. Use a graphing utility to graph both equations in the same viewing window. Determine the coordinates of the point of tangency.

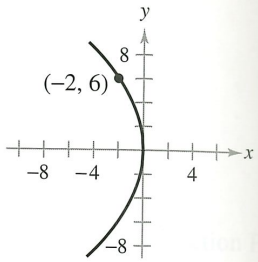
Parabola	*Tangent Line*
25. $y^2 - 8x = 0$	$x - y + 2 = 0$
26. $x^2 + 12y = 0$	$x + y - 3 = 0$

In Exercises 27–38, find the standard form of the equation of the parabola with its vertex at the origin.

27.



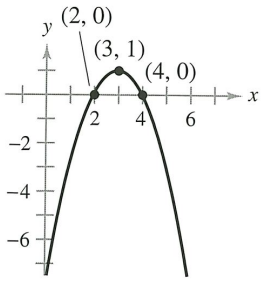
28.



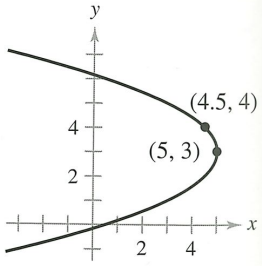
29. Focus: $\left(0, -\frac{3}{2}\right)$
30. Focus: $(2, 0)$
31. Focus: $(-2, 0)$
32. Focus: $(0, -2)$
33. Directrix: $y = -1$
34. Directrix: $y = 3$
35. Directrix: $x = 2$
36. Directrix: $x = -3$
37. Horizontal axis and passes through the point $(4, 6)$
38. Vertical axis and passes through the point $(-3, -3)$

In Exercises 39–48, find the standard form of the equation of the parabola.

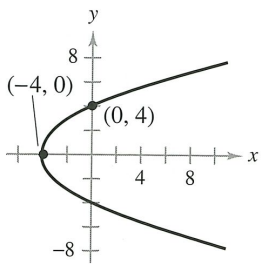
39.



40.



41.



42.