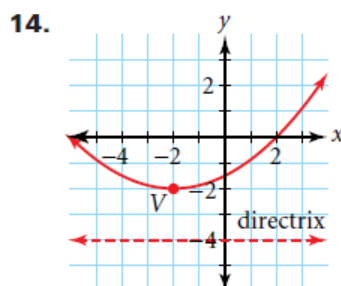
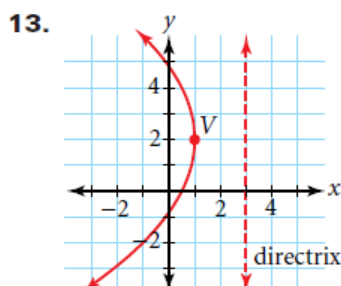
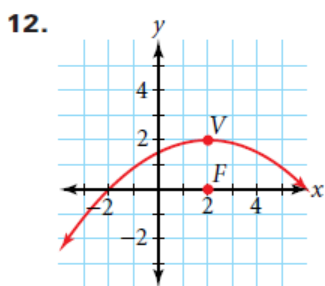
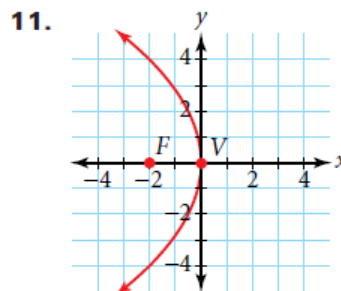
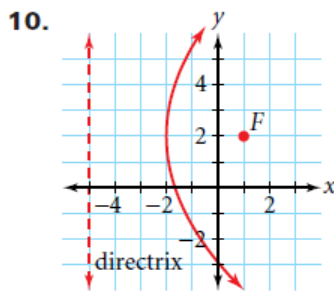
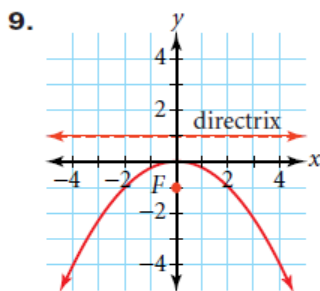


**Practice and Apply**

Write the standard equation for each parabola graphed below.



Graph each equation. Label the vertex, focus, and directrix.

15.  $y = \frac{1}{4}x^2$

16.  $y = \frac{1}{8}x^2$

17.  $x = \frac{1}{20}y^2$

18.  $x = \frac{1}{40}y^2$

19.  $y = x^2$

20.  $y = 2x^2$

21.  $y + 3 = \frac{1}{8}(x + 2)^2$

22.  $x - 1 = \frac{1}{12}(y + 2)^2$

23.  $y - 4 = -(x - 1)^2$

24.  $y - 1 = \frac{1}{4}(x - 1)^2$

25.  $y = \frac{1}{8}(x - 1)^2$

26.  $x - 3 = -\frac{1}{8}(y + 1)^2$

27.  $y + 3 = \frac{1}{12}x^2$

28.  $-12y = (x + 2)^2$

29.  $x - 1 = \frac{1}{2}(y + 2)^2$

30.  $x^2 + 4x - 6y = -10$

31.  $x^2 - 6x + 10y = 1$

32.  $x^2 - 8x - y + 20 = 0$

33.  $4x + y^2 + 3y = -5$

34.  $4x + y^2 - 6y = 9$

35.  $-14x + 2y^2 - 8y = 2$

Write the standard equation for the parabola with the given characteristics.

36. vertex: (0, 0)  
focus: (-4, 0)

37. vertex: (0, 0)  
focus: (0, -5)

38. vertex: (0, 0)  
directrix:  $y = -1$

39. vertex: (0, 0)  
directrix:  $x = 4$

40. vertex: (0, 0)  
focus: (0, 3)

41. vertex: (0, 0)  
focus: (2, 0)

42. vertex: (0, 0)  
directrix:  $x = -3$

43. vertex: (0, 0)  
directrix:  $y = 12$

44. directrix:  $y = -4$   
focus: (0, 4)

45. focus: (3, 0)  
directrix:  $x = -3$

46. focus: (0, -5)  
directrix:  $y = 5$

47. directrix:  $x = 8$   
focus: (-8, 0)