In Exercises 11–14, find $(f \circ g)(3)$ and $(g \circ f)(-2)$

11. $f(x) = 2x - 3;\ g(x) = x + 1$

13. $f(x) = x^2 + 4;\ g(x) = \sqrt{x + 1}$

14. $f(x) = \dfrac{x}{x + 1};\ g(x) = 9 - x^2$

In Exercises 15–22, find $f(g(x))$ and $g(f(x))$. State the domain of each.

15. $f(x) = 3x + 2;\ g(x) = x - 1$

17. $f(x) = x^2 - 2;\ g(x) = \sqrt{x + 1}$

18. $f(x) = \dfrac{1}{x - 1};\ g(x) = \sqrt{x}$

In Exercises 23–30, find $f(x)$ and $g(x)$ so that the function can be described as $y = f(g(x))$. (There may be more than one possible decomposition.)

24. $y = (x^3 + 1)^2$

27. $y = (x - 3)^5 + 2$

28. $y = e^{\sin x}$

29. $y = \cos(\sqrt{x})$

31. Weather Balloons A high-altitude spherical weather balloon expands as it rises due to the drop in atmospheric pressure. Suppose that the radius r increases at the rate of 0.03 inches per second and that $r = 48$ inches at time $t = 0$. Determine an equation that models the volume V of the balloon at time t and find the volume when $t = 300$ seconds.

36. Which of the ordered pairs $(5, 1)$, $(3, 4)$, and $(0, -5)$ are in the relation given by $x^2 + y^2 = 25$?

In Exercises 37–44, find two functions defined implicitly by the given relation.

37. $x^2 + y^2 = 25$

39. $x^2 - y^2 = 25$