27. Demonstrate that the identity function $i(x) = x$ is its own inverse under composition.

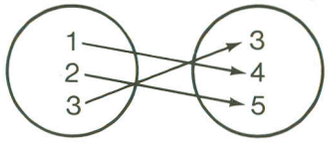
In 28–30: **a.** On graph paper, draw the graph of the function, including points whose x-coordinates are -2, -1, 0, 1, and 2. **b.** On the same axes, draw the graph of the relation that is the reflection of the given function in the line $y = x$. **c.** Is the relation in part **b** a function? **d.** State the equation of the relation drawn in part **b**.

28. $y = x^3$ 29. $y = |x|$ 30. $y = 3$

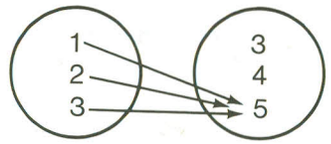
31. Under composition, the identity function $y = x$ is its own inverse. Name another function in the form $y = mx + b$ that is its own inverse.

7 REVIEW EXERCISES

In 1–9: **a.** State the domain of the relation. **b.** State the range of the relation. **c.** Is the relation a function? If not, explain why.



1.



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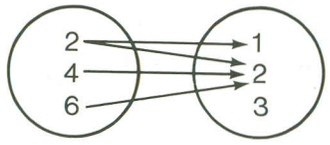

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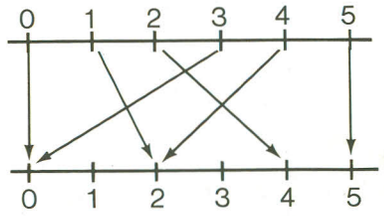

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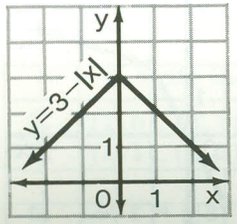

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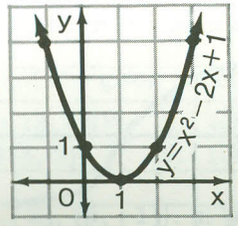

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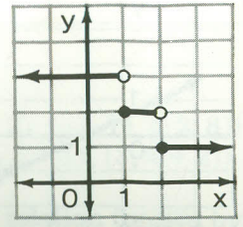

7.

8. $\{(2, 2), (3, 1), (1, 3)\}$ 9. $\{(2, 4), (3, 1), (2, 3), (3, 2)\}$

10. If the function $f(x) = x^2 - 4x$, find the value of $f(-3)$.

11. If $g(x) = \sqrt[3]{x}$, find $g(-8)$.

In 12–14, 30, and 32, select the numeral preceding the expression that best completes the sentence or answers the question.

12. Which of the following is *not* a function?
(1) $y = |5x|$ (2) $y = 5x^2$ (3) $y = 5$ (4) $x = 5$

13. The domain for $h(x) = 2x - 7$ is $-2 \leq x \leq 2$. The range is:
(1) $-3 \leq y \leq 3$ (2) $-11 \leq y \leq -3$
(3) $-11 \leq y \leq 3$ (4) $-11 \leq y \leq 11$

14. The domain for $p(x) = 6 - 2x$ is $\{x | -5 \leq x \leq 1\}$. The greatest value in the range is:
(1) 16 (2) 8 (3) -4 (4) 4

In 15–17, state the largest possible domain such that the given relation is a function.

15. $f(x) = \dfrac{x - 2}{x - 8}$ 16. $x \xrightarrow{g} \dfrac{4}{x^2 + 4x}$ 17. $y = \dfrac{1}{\sqrt{x - 8}}$

In 18–20, for the given function: **a.** State the domain. **b.** State the range.

18. $f(x) = 4x - 12$ 19. $x \xrightarrow{g} [x]$ 20. $y = \sqrt{x - 8}$

21. Let $m(x) = 5x$ and $d(x) = x - 4$. **a.** Find $(m \circ d)(6)$. **b.** Find $(d \circ m)(6)$. **c.** Write the rule for $(m \circ d)(x)$. **d.** Write the rule for $(d \circ m)(x)$.

In 22–25, given functions f and g, find the rule of the composition $(f \circ g)(x)$.

22. $f(x) = x + 2$; $g(x) = x - 9$ 23. $f(x) = 2x + 1$; $g(x) = x - 3$
24. $f(x) = x^2$; $g(x) = 2x + 1$ 25. $f(x) = 3x + 6$; $g(x) = \frac{1}{3}x - 2$

26. Write the inverse of the function $\{(3, -8), (4, 1), (0, -5), (-2, 6)\}$.

In 27–29, write, in the form $y = mx + b$, the equation of the inverse of the given function.

27. $y = 6x$ 28. $y = 2x - 14$ 29. $y = 3 - \frac{1}{3}x$