Name _____ Class _____ Date _____

# 6-7 Practice

*Form G*

## Inverse Relations and Functions

**Find the inverse of each relation. Graph the given relation and its inverse.**

1.

| $x$ | $-2$ | $-1$ | $0$ | $1$ |
|---|---|---|---|---|
| $y$ | $-3$ | $-2$ | $-1$ | $0$ |

2.

| $x$ | $0$ | $1$ | $2$ | $3$ |
|---|---|---|---|---|
| $y$ | $-3$ | $-1$ | $0$ | $-2$ |

3.

| $x$ | $-3$ | $-1$ | $1$ | $2$ |
|---|---|---|---|---|
| $y$ | $-1$ | $0$ | $1$ | $3$ |

4.

| $x$ | $-3$ | $-2$ | $-1$ | $0$ |
|---|---|---|---|---|
| $y$ | $3$ | $2$ | $1$ | $0$ |

**Find the inverse of each function. Is the inverse a function?**

5. $y = x^2 + 2$

6. $y = x + 2$

7. $y = 3(x + 1)$

8. $y = -x^2 - 3$

9. $y = 2x - 1$

10. $y = 1 - 3x^2$

11. $y = 5x^2$

12. $y = (x + 3)^2$

13. $y = 6x^2 - 4$

14. $y = 3x^2 - 2$

15. $y = (x + 4)^2 - 4$

16. $y = -x^2 + 4$

**Graph each relation and its inverse.**

17. $y = \frac{x + 3}{3}$

18. $y = \frac{1}{2}x + 5$

19. $y = 2x + 5$

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

21. $y = (x + 2)^2$

22. $y = (2x - 1)^2 - 2$

Name _____ Class _____ Date _____

# 6-7 Practice (continued) Form G

## Inverse Relations and Functions

**For each function, find the inverse and the domain and range of the function and its inverse. Determine whether the inverse is a function.**

23. $f(x) = \frac{1}{6}x$

24. $f(x) = -\frac{1}{5}x + 2$

25. $f(x) = x^2 - 2$

26. $f(x) = x^2 + 4$

27. $f(x) = \sqrt{x - 1}$

28. $f(x) = \sqrt{3x}$

29. $f(x) = 3 - x$

30. $f(x) = (x + 1)^2$

31. $f(x) = \frac{1}{\sqrt{x}}$

32. The equation $f(x) = 198{,}900x + 635{,}600$ can be used to model the number of utility trucks under 6000 pounds that are sold each year in the U.S. with $x = 0$ representing the year 1992. Find the inverse of the function. Use the inverse to estimate in which year the number of utility trucks under 6000 pounds sold in the U.S. will be 6,000,000. Source: *www.infoplease.com*

33. The formula $s = 0.04n + 2500$ gives an employee's monthly salary $s$, in dollars, after selling $n$ dollars in merchandise at an appliance store.
    a. Find the inverse of the function. Is the inverse a function?
    b. Use the inverse to find the amount of merchandise sold if the employee's salary was $2820 last month.

34. The formula for the surface area $A$ of a sphere of radius $r$ is $A = 4\pi r^2$ for $r \geq 0$.
    a. Find the inverse of the formula. Is the inverse a function?
    b. Use the inverse to find the radius of a sphere with surface area 10,000 $m^3$.

**Let $f(x) = 2x + 5$. Find each value.**

35. $(f^{-1} \circ f)(-1)$

36. $(f \circ f^{-1})(3)$

37. $(f \circ f^{-1})\left(-\frac{1}{2}\right)$