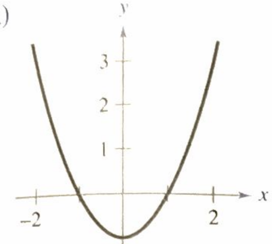
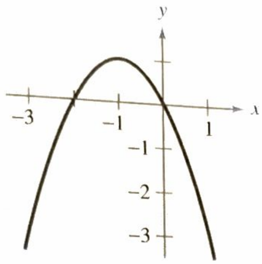
7. Use the graph of $f(x) = x^2$ to write formulas for the functions whose graphs are shown below.

(a)

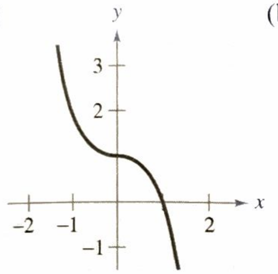


(b)

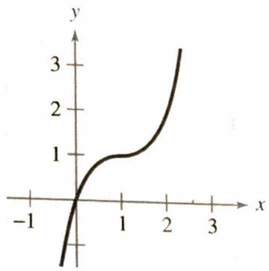


8. Use the graph of $f(x) = x^3$ to write formulas for the functions whose graphs are shown below.

(a)

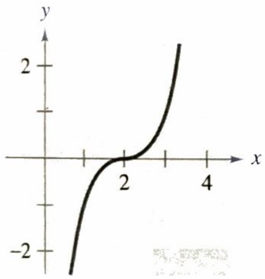


(b)

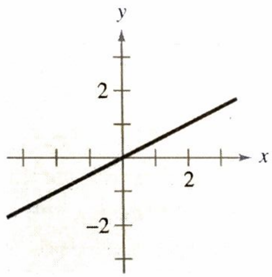


In Exercises 9–14, identify the common function and the transformation shown in the graph. Write the formula for the graphed function.

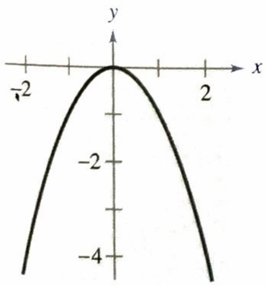
9.



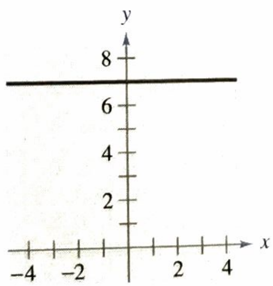
10.



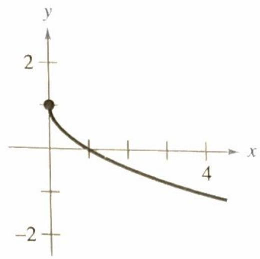
11.



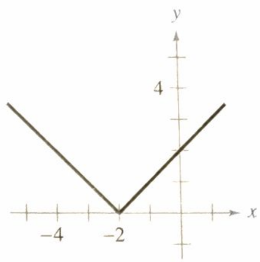
12.



13.

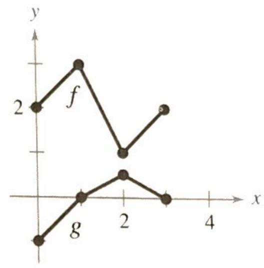


14.

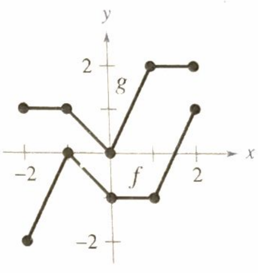


In Exercises 15–18, use the graphs of f and g to graph $h(x) = (f + g)(x)$.

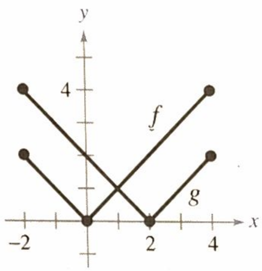
15.



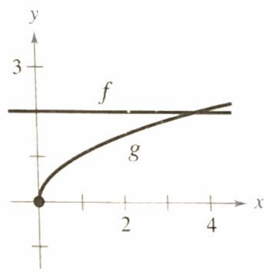
16.



17.



18.



In Exercises 19–26, find (a) $(f + g)(x)$, (b) $(f - g)(x)$, (c) $(fg)(x)$, and (d) $(f/g)(x)$. What is the domain of f/g?

19. $f(x) = x + 1$, $\quad g(x) = x - 1$

20. $f(x) = 2x - 5$, $\quad g(x) = 1 - x$

21. $f(x) = x^2$, $\quad g(x) = 1 - x$

22. $f(x) = 2x - 5$, $\quad g(x) = 5$

23. $f(x) = x^2 + 5$, $\quad g(x) = \sqrt{1 - x}$

24. $f(x) = \sqrt{x^2 - 4}$, $\quad g(x) = \dfrac{x^2}{x^2 + 1}$

25. $f(x) = \dfrac{1}{x}$, $\quad g(x) = \dfrac{1}{x^2}$

26. $f(x) = \dfrac{x}{x + 1}$, $\quad g(x) = x^3$

In Exercises 27–38, evaluate the indicated function for $f(x) = x^2 + 1$ and $g(x) = x - 4$.

27. $(f + g)(3)$
28. $(f - g)(-2)$
29. $(f - g)(0)$
30. $(f + g)(1)$
31. $(f - g)(2t)$
32. $(f + g)(t - 1)$
33. $(fg)(4)$
34. $(fg)(-6)$
35. $\left(\frac{f}{g}\right)(5)$
36. $\left(\frac{f}{g}\right)(0)$
37. $\left(\frac{f}{g}\right)(-1) - g(3)$
38. $(2f)(5)$

In Exercises 39–42, graph the functions f, g, and $f + g$ on the same set of coordinate axes.

39. $f(x) = \frac{1}{2}x, \quad g(x) = x - 1$
40. $f(x) = \frac{1}{3}x, \quad g(x) = -x + 4$
41. $f(x) = x^2, \quad g(x) = -2x$
42. $f(x) = 4 - x^2, \quad g(x) = x$

Graphical Reasoning **In Exercises 43 and 44, use a graphing utility to sketch the graphs of f, g, and $f + g$ on the same viewing rectangle. Which function contributes most to the magnitude of the sum when $0 \le x \le 2$? Which function contributes most to the magnitude of the sum when $x > 6$?**

43. $f(x) = 3x, \quad g(x) = -\frac{x^3}{10}$
44. $f(x) = \frac{x}{2}, \quad g(x) = \sqrt{x}$

45. ***Stopping Distance*** While traveling in a car at x miles per hour, you are required to stop quickly to avoid an accident. The distance the car travels during your reaction time is given by $R(x) = \frac{3}{4}x$. The distance traveled while you are braking is given by

$$B(x) = \frac{1}{15}x^2.$$

Find the function giving total stopping distance T. Graph the functions R, B, and T on the same set of coordinate axes for $0 \le x \le 60$.

46. ***Comparing Sales*** You own two restaurants. 1990 to 1995, the sales R_1 (in thousands of d for one restaurant can be modeled by

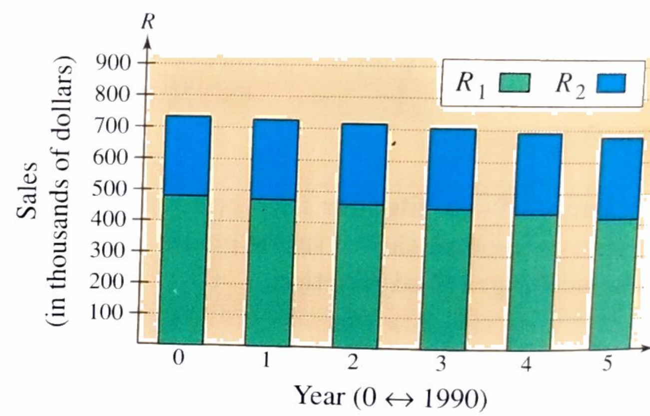
$$R_1 = 480 - 8t - 0.8t^2, \qquad t = 0, 1, 2, 3, 4,$$

where $t = 0$ represents 1990. During the 6-year period, the sales R_2 (in thousands of do for the second restaurant can be modeled by

$$R_2 = 254 + 0.78t, \qquad t = 0, 1, 2, 3, 4, 5.$$

(a) Write a function that represents the total sale the two restaurants. Use a graphing utilit graph the total sales function.

(b) Use the *stacked bar graph* in the figure, w represents the total sales during the 6- period, to determine whether the total sales h been increasing or decreasing.



Data Analysis **In Exercises 47 and 48, use the table, which gives the variable costs for operating an automobile in the United States for the years 1985 through 1991. The variables y_1, y_2, and y_3 represent the costs in cents per mile for gas and oil, maintenance, and tires, respectively.** (Source: American Automobile Manufacturers Association)

Year	1985	1986	1987	1988	1989	1990	1991
y_1	6.16	4.48	4.80	5.20	5.20	5.40	6.70
y_2	1.23	1.37	1.60	1.60	1.90	2.10	2.20
y_3	0.65	0.67	0.80	0.80	0.80	0.90	0.90

47. Create a stacked bar graph for the data.