8 CHAPTER TEST

The variables x and y vary inversely. Use the given values to write an equation relating x and y. Then find y when $x = 4$.

1. $x = 5, y = 2$ $y = \frac{10}{x}; \frac{5}{2}$
2. $x = -2, y = 8$ $y = \frac{-16}{x}; -4$
3. $x = \frac{3}{2}, y = 10$ $y = \frac{15}{x}; \frac{15}{4}$
4. $x = 3, y = 6$ $y = \frac{18}{x}; \frac{9}{2}$
5. $x = -4, y = \frac{7}{2}$ $y = \frac{-14}{x}; -\frac{7}{2}$
6. $x = \frac{3}{4}, y = \frac{5}{8}$ $y = \frac{15}{32x}; \frac{15}{128}$

Graph the function. State the domain and range. 7–9. See margin.

7. $y = \frac{2}{x+5} - 3$
8. $y = \frac{-1}{x-4} - 1$
9. $f(x) = \frac{6-x}{2x+1}$

Graph the function. 10–12. See margin.

10. $y = \frac{4}{x^2+2}$
11. $y = \frac{x^2-4}{x^2+8x+15}$
12. $g(x) = \frac{x^2+3}{2x-1}$

Find the least common multiple of the polynomials.

13. $(x-3)(x+5)$ and $x(x+5)$ $x(x-3)(x+5)$
14. $4x^2(x-2)$ and $8x(x+2)$ $8x^2(x-2)(x+2)$
15. x^2-4x and x^2-2x-8 $x(x-4)(x+2)$
16. $2x+6$ and x^3+10x^2+21x $2x(x+7)(x+3)$

Perform the indicated operation and simplify.

17. $\frac{3x^2y}{4x^3y^5} \div \frac{6y^2}{2xy^3}$ $\frac{1}{4y^3}$
18. $\frac{x^2-3x-4}{x^2-3x-18} \cdot \frac{x-6}{x+1}$ $\frac{x-4}{x+3}$
19. $\frac{x^2-8x+15}{x^2+12x+32} \cdot \frac{x+4}{x^2-25}$ $\frac{x-3}{(x+5)(x+8)}$
20. $\frac{x^2-11x+28}{x^2+5x+4} \div (x^2-16)$ $\frac{x-7}{(x+4)^2(x+1)}$
21. $\frac{3x}{x+5} - \frac{4x+1}{x+5}$ $\frac{-x-1}{x+5}$
22. $\frac{4}{x-3} + \frac{2}{x+6}$ $\frac{6(x+3)}{(x-3)(x+6)}$
23. $\frac{3x}{x^2+x-12} - \frac{6}{x+4}$ $\frac{-3(x-6)}{(x+4)(x-3)}$
24. $\frac{4}{x+5} + \frac{2x}{x^2-25}$ $\frac{2(3x-10)}{(x+5)(x-5)}$

Solve the equation. Check for extraneous solutions.

25. $\frac{3}{x+2} = \frac{x-3}{2x+4}$ 9
26. $\frac{1}{x+6} + \frac{x+1}{x} = \frac{13}{x+6}$ 2, 3
27. $\frac{x-2}{x-1} = \frac{x+2}{x+4}$ 6

28. **SOUND INTENSITY** The intensity I of a sound varies inversely with the square of the distance r from the source of the sound. Write an equation relating I, r, and a constant a. $I = \frac{a}{r^2}$

29. **CABLE TV** You have subscribed to a cable television service. The cable company charges you a one-time installation fee of \$30 and a monthly fee of \$50. Write and graph a model that gives the average cost per month as a function of the number of months you have subscribed to the service. After how many months will the average cost be \$56? $C = \frac{30+50m}{m}$, see margin for art; 5 mo.

30. **WEB HOSTING** You are building a new website for your school. A company that hosts websites offers a dedicated server for a \$50 setup fee plus a monthly fee of \$99. How many months would you need to use this service in order for your average monthly cost to fall to \$100? 50 mo

Additional Resources

Assessment Book

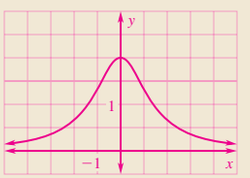
- Chapter Test, Levels A, B, C, pp. 112–117
- Standardized Chapter Test, pp. 118–119
- SAT/ACT Chapter Test, pp. 120–121
- Alternative Assessment, pp. 122–123

Test Generator CD-ROM

Chapter Test

Easily-readable reduced copies (with answers) of Chapter Test B, the Standardized Chapter Test, and the Alternative Assessment from the Assessment Book can be found on pp. 548E–548F.

10.



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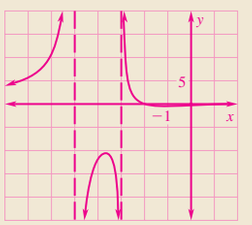

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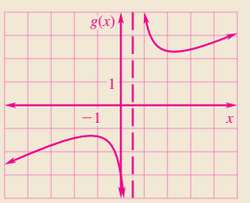

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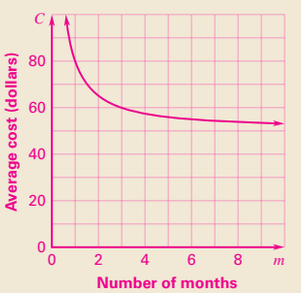

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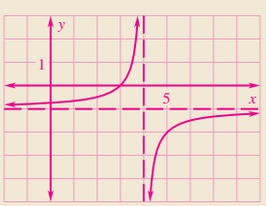
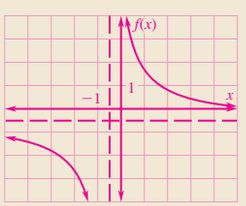


domain: all real numbers except 4,
range: all real numbers except −1

9.



domain: all real numbers except $\frac{1}{2}$,
range: all real numbers except $-\frac{1}{2}$