

In Exercises 61 and 62, insert the missing factor.

$$61. \frac{2}{3}x^4 - \frac{3}{8}x^3 + \frac{5}{6}x^2 = \frac{1}{24}x^2 (\quad)$$

$$62. \frac{t}{\sqrt{t+1}} - \sqrt{t+1} = \frac{1}{\sqrt{t+1}} (\quad)$$

In Exercises 63–68, perform the operations and simplify.

$$63. \frac{x^2 - 4}{x^4 - 2x^2 - 8} \cdot \frac{x^2 + 2}{x^2}$$

$$64. \frac{4x - 6}{(x - 1)^2} \div \frac{2x^2 - 3x}{x^2 + 2x - 3}$$

$$65. 2x + \frac{3}{2(x - 4)} - \frac{1}{2(x + 2)}$$

$$66. \frac{1}{x} - \frac{x - 1}{x^2 + 1}$$

$$67. \frac{1}{x - 1} + \frac{1 - x}{x^2 + x + 1}$$

$$68. \frac{1}{L} \left(\frac{1}{y} - \frac{1}{L - y} \right), \text{ where } L \text{ is a constant}$$

In Exercises 69 and 70, simplify the compound fraction.

$$69. \frac{\left[\frac{3a}{(a^2/x) - 1} \right]}{\left(\frac{a}{x} - 1 \right)}$$

$$70. \frac{\left(\frac{1}{2x - 3} - \frac{1}{2x + 3} \right)}{\left(\frac{1}{2x} - \frac{1}{2x + 3} \right)}$$

In Exercises 71–100, solve the equation (if possible) and check your solution.

$$71. 3x - 2(x + 5) = 10 \quad 72. 4x + 2(7 - x) = 5$$

$$73. 4(x + 3) - 3 = 2(4 - 3x) - 4$$

$$74. \frac{1}{2}(x - 3) - 2(x + 1) = 5$$

$$75. 3 \left(1 - \frac{1}{5t} \right) = 0$$

$$76. \frac{1}{x - 2} = 3$$

$$77. 6x = 3x^2$$

$$78. 15 + x - 2x^2 = 0$$

$$79. (x + 4)^2 = 18$$

$$80. 16x^2 = 25$$

$$81. x^2 - 12x + 30 = 0$$

$$82. x^2 + 6x - 3 = 0$$

$$83. 5x^4 - 12x^3 = 0$$

$$84. 4x^3 - 6x^2 = 0$$

$$85. \frac{4}{(x - 4)^2} = 1$$

$$86. \frac{1}{(t + 1)^2} = 1$$

$$87. \sqrt{x + 4} = 3$$

$$88. \sqrt{x - 2} - 8 = 0$$

$$89. 2\sqrt{x} - 5 = 0$$

$$90. \sqrt{3x - 2} = 4 - x$$

$$91. \sqrt{2x + 3} + \sqrt{x - 2} = 2$$

$$92. 5\sqrt{x} - \sqrt{x - 1} = 6$$

$$93. (x - 1)^{2/3} - 25 = 0$$

$$94. (x + 2)^{3/4} = 27$$

$$95. (x + 4)^{1/2} + 5x(x + 4)^{3/2} = 0$$

$$96. 8x^2(x^2 - 4)^{1/3} + (x^2 - 4)^{4/3} = 0$$

$$97. |x - 5| = 10$$

$$98. |2x + 3| = 7$$

$$99. |x^2 - 3| = 2x$$

$$100. |x^2 - 6| = x$$

In Exercises 101–104, solve the equation for the indicated variable.

$$101. \text{ Solve for } r: V = \frac{1}{3}\pi r^2 h$$

$$102. \text{ Solve for } X: Z = \sqrt{R^2 - X^2}$$

$$103. \text{ Solve for } p: L = \frac{k}{3\pi r^2 p}$$

$$104. \text{ Solve for } v: E = 2kw \left(\frac{v}{2} \right)^2$$

In Exercises 105–116, solve the inequality.

$$105. x^2 - 2x \geq 3$$

$$106. \frac{1}{2}(3 - x) > \frac{1}{3}(2 - 3x)$$

$$107. \frac{x - 5}{3 - x} < 0$$

$$108. \frac{2}{x + 1} \leq \frac{3}{x - 1}$$

$$109. |x - 2| < 1$$

$$110. |x| \leq 4$$

$$111. |x - \frac{3}{2}| \geq \frac{3}{2}$$

$$112. |x - 3| > 4$$

$$113. \frac{x}{5} - 6 \leq -\frac{x}{2} + 6$$

$$114. 2x^2 + x \geq 15$$

$$115. (x - 4)|x| > 0$$

$$116. |x(x - 6)| < 5$$

In Exercises 117 and 118, find the domain of the expression by finding the interval(s) on the real number line for which the radicand is nonnegative.

$$117. \sqrt{2x - 10}$$

$$118. \sqrt{x(x - 4)}$$

Chapter Test

Take this test as you would take a test in class. After you are done, check your work against the answers given in the back of the book.



The *Interactive CD-ROM* provides answers to the Chapter Tests and Cumulative Tests. It also offers Chapter Pre-Tests (which test key skills and concepts covered in previous chapters) and Chapter Post-Tests, both of which have randomly generated exercises with diagnostic capabilities.

In Exercises 1 and 2, evaluate the quantity without the aid of a calculator.

1. $\frac{5}{18} \div \frac{15}{8}$

2. $\sqrt{5} \cdot \sqrt{125}$

In Exercises 3 and 4, simplify the expression.

3. $3z^2(2z^3)^2$

4. $9z\sqrt{8z} - 3\sqrt{2z^3}$

In Exercises 5–8, perform the operations and simplify.

5. $(x^2 + 3) - [3x + (8 - x^2)]$

6. $(3x - 2)^2$

7. $\frac{8x}{x-3} + \frac{24}{3-x}$

8. $\left(\frac{2}{x} - \frac{2}{x+1}\right) \div \left(\frac{4}{x^2-1}\right)$

9. Completely factor the expression $x^3 + 2x^2 - 4x - 8$.

10. Write an expression for the area of the shaded region shown in the figure. Then simplify the result.

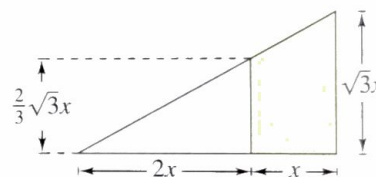


FIGURE FOR 10

In Exercises 11–16, solve the equation.

11. $\frac{2}{3}(x-1) + \frac{1}{4}x = 10$

12. $\frac{x-2}{x+2} + \frac{4}{x+2} + 4 = 0$

13. $3x^2 + 6x + 2 = 0$

14. $x^4 + x^2 - 6 = 0$

15. $2\sqrt{x} - \sqrt{2x+1} = 1$

16. $|3x-1| = 7$

In Exercises 17 and 18, solve the inequality and sketch the solution.

17. $-3 \leq 2(x+4) < 14$

18. $\frac{2}{x} > \frac{5}{x+6}$

19. On the first part of a 350-kilometer trip, a salesperson traveled 2 hours and 15 minutes at an average speed of 100 kilometers per hour. Find the average speed required for the remainder of the trip if the salesperson needs to arrive at the destination in another hour and 20 minutes.
20. Plot the points $(-2, 5)$ and $(6, 0)$. Find the coordinates of the midpoint of the line segment joining the points and the distance between the points.