12 CHAPTER TEST

Given that y varies inversely with x, use the specified values to write an inverse variation equation that relates x and y. Then find y when $x = 3$.

1. $x = 2, y = 5$

2. $x = 9, y = 9$

3. $x = \frac{9}{2}, y = 4$

4. Tell whether the table represents inverse variation. If so, write the inverse variation equation.

x	−10	−2	4	5	20
y	0.5	2.5	−1.25	−1	−0.25

Graph the function.

5. $y = \frac{-6}{x}$

6. $y = \frac{2}{x - 5} + 2$

7. $y = \frac{3x - 1}{x + 4}$

Divide.

8. $(v^2 - 16v + 49) \div (v - 8)$

9. $(8w - 2w^2 - 6) \div (w - 1)$

10. $(6x^2 + x) \div (2x + 1)$

Simplify the expression, if possible. State the excluded values.

11. $\frac{42x^4}{3x^2}$

12. $\frac{2y - 8}{4 - y}$

13. $\frac{z^2 - 4z - 77}{z^2 - 13z + 22}$

Find the sum, difference, product, or quotient.

14. $\frac{r^2 - 9r + 18}{r^2 + 11r + 30} \cdot \frac{r + 5}{r^2 - 36}$

15. $\frac{s^2 + 3s - 10}{s^2 - 9} \div \frac{s - 2}{s + 3}$

16. $\frac{x^2 - 9x}{x + 3} \div (x^2 - 6x - 27)$

17. $\frac{4}{m + 2} - \frac{3m}{m - 3}$

18. $\frac{2n + 7}{n - 1} - \frac{8n}{n + 5}$

19. $\frac{p + 1}{p^2 - 49} + \frac{p - 1}{p^2 + 10p + 21}$

Solve the equation. Check your solution.

20. $\frac{7}{u + 1} = \frac{4}{u + 4}$

21. $\frac{t + 11}{t - 11} = \frac{11t + 121}{t^2 - 6t - 55}$

22. $\frac{8}{x + 4} = \frac{5x}{x^2 - 2x - 24} - 1$

23. GOLF Your local golf club offers two payment options to anyone who wants to use its course. For the first option, you pay a one-time fee of $750 to join for the season plus $25 each time you use the golf course. For the second option, you instead pay $45 each time you use the golf course.

a. Using the first option, write an equation that gives your average cost C (in dollars) per use of the golf course as a function of the number g of times you use the golf course. Then graph the equation.

b. Use the graph to approximate the number of times you need to use the golf course before the average cost is less than $45.

24. CLEANING You and your brother start a house cleaning business for the summer. Your brother needs twice the time you need to clean a certain room. Working together, the two of you need 60 minutes to clean the room.

a. Write an equation that you can use to find the time t (in minutes) you need to clean the room by yourself. Then solve the equation.

b. How long will each of you need to clean the room individually?