

Chapter 4 Review 3

Use the composition of functions to determine whether the given functions are inverse functions.

1. $f(x) = \frac{2}{3}x + 4$ $g(x) = \frac{3}{2}x - 6$ 2. $p(x) = \frac{x-1}{x}$ $q(x) = \frac{x}{x-1}$

Find the inverse of each function.

3. $f(x) = \frac{1}{4}x + 5$ 4. $f(x) = \frac{x}{x-3}$ 5. $f(x) = \sqrt{2x-3}$ 6. $\{(-3,10), (-1,2), (0,1), (4,17)\}$

Solve each equation.

7. $\log_7 343 = x$ 8. $5(3^x) = 10935$ 9. $10^{\log_{12} x} = 72$ 10. $\ln(x+7) = 2$ 11. $8^{x+12} = 4096$

Write each equation in its exponential form.

12. $4 = \log_2 16$ 13. $-3 = \log \frac{1}{1000}$ 14. $\log_6(x-3) = 2$ 15. $\ln x = 5$

Write each equation in its logarithmic form. Assume $y > 0$ and $b > 0$.

16. $5^3 = 125$ 17. $9.97 = e^{2.3}$ 18. $27^{\frac{1}{3}} = 3$ 19. $10^{4.8} = (x+7)$

Expand the logarithmic expressions.

20. $\log(x\sqrt[5]{y^3z})$ 21. $\log_4\left(\frac{(xz)^3}{64y^{\frac{1}{2}}}\right)$ 22. $\ln\left(\frac{x^2y}{\sqrt[3]{ez^2}}\right)$

Write each logarithmic expression as a single logarithm with a coefficient of 1.

23. $\log x + \frac{1}{2} \log y - [\log 3 + \log z]$ 24. $2 \ln x - \left(\ln x - \frac{1}{2} \ln yz \right)$ 25. $\frac{2}{3} \log_5(xy) + \log_5 z - 2 \log_5 x$

Use the change-of-base formula and a calculator to approximate each logarithm accurate to six significant digits.

26. $\log_2 9$

27. $\log_3 42$

28. $\log_7 6.13$

29. $\log_4 \pi$

Solve the equation for x .

30. $8^{4x-7} = 124$

31. $\log_2 2x + \log_2 x = 5$

32. $2 \log_2 x - \log_2 6 = 2$

33. $\log(7x) + 4 = 5$

34. Find the balance when \$1200 is invested at an annual interest rate of 7.5% for 8 years is compounded

- a. Monthly
- b. Weekly
- c. Continuously