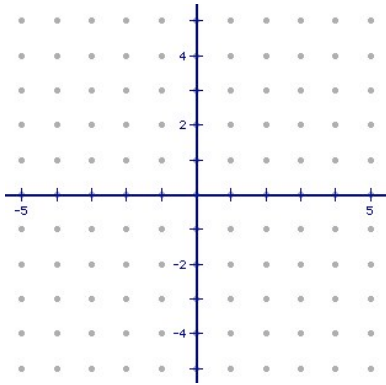


**Graph the functions. State the domain and range. Also state the asymptotes if there are any. The chapter the problem is found is given in parentheses.**

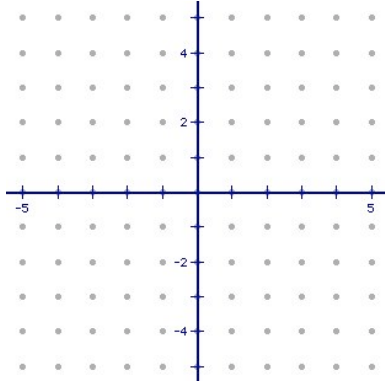
1. (7)  $f(x) = \sqrt{x}$



Domain: \_\_\_\_\_

Range: \_\_\_\_\_

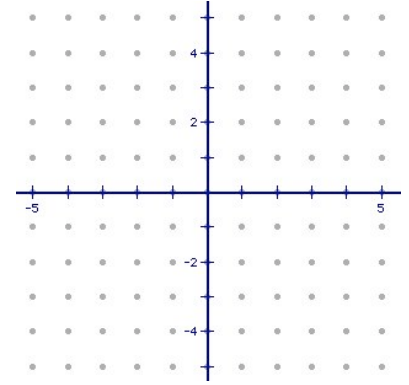
2. (7)  $f(x) = \sqrt[3]{x+3} - 1$



Domain: \_\_\_\_\_

Range: \_\_\_\_\_

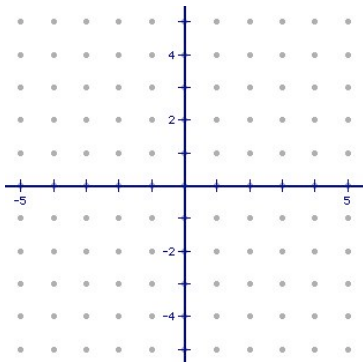
3. (7)  $f(x) = \sqrt{x+3} - 1$



Domain: \_\_\_\_\_

Range: \_\_\_\_\_

4. (8)  $f(x) = 2(.5)^x - 3$

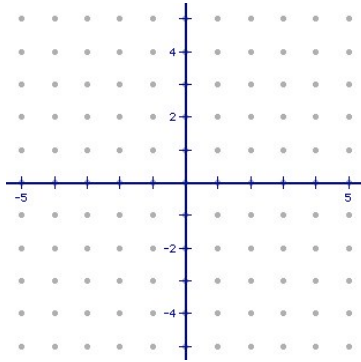


Domain: \_\_\_\_\_

Range: \_\_\_\_\_

Asymptote: \_\_\_\_\_

5. (8)  $f(x) = (2)^{x+1} - 3$

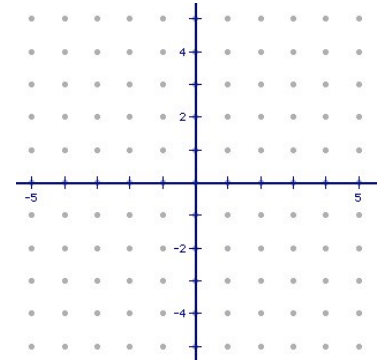


Domain: \_\_\_\_\_

Range: \_\_\_\_\_

Asymptote: \_\_\_\_\_

6. (8)  $f(x) = \log_3(x+1) - 2$

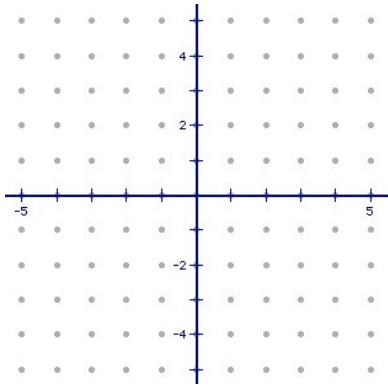


Domain: \_\_\_\_\_

Range: \_\_\_\_\_

Asymptote: \_\_\_\_\_

7. (8)  $f(x) = \ln x - 2$

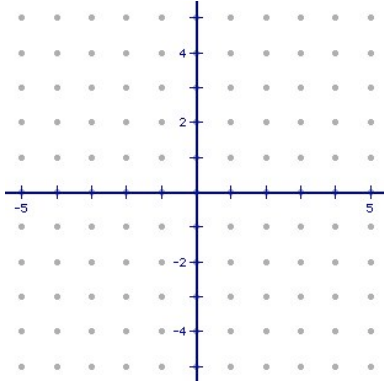


Domain: \_\_\_\_\_

Range: \_\_\_\_\_

Asymptote: \_\_\_\_\_

8. (9)  $y = \frac{1}{x+2} - 2$

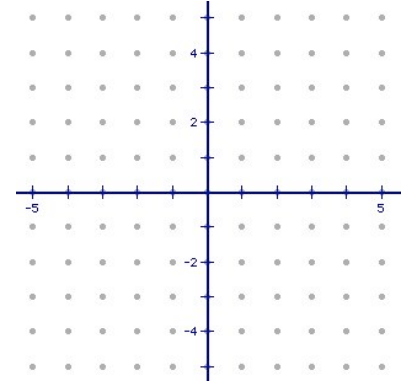


Domain: \_\_\_\_\_

Range: \_\_\_\_\_

Asymptotes: \_\_\_\_\_

9. (9)  $y = \frac{3}{x+1} + 2$



Domain: \_\_\_\_\_

Range: \_\_\_\_\_

Asymptotes: \_\_\_\_\_

**(7) Simplify each radical expression. Assume all variables are positive.**

10.  $\sqrt{36x^4}$

11.  $\sqrt[4]{m^{18}n^8}$

12.  $\sqrt[3]{10a^4} \cdot \sqrt[3]{20a}$

13.  $\frac{\sqrt{18x^5y}}{\sqrt{2x}}$

14.  $\left(x^{-\frac{4}{3}}y^{\frac{3}{5}}\right)^{15}$

15.  $\left(\frac{81y^{16}}{16x^{12}}\right)^{\frac{1}{4}}$

16.  $2\sqrt{7} + 3\sqrt{7}$

27.  $\sqrt{27} + \sqrt{48}$

28.  $8\sqrt{45x} - 3\sqrt{80}$

**(7) Let  $f(x) = x^2$  and  $g(x) = 3x + 1$ . Evaluate each expression.**

19.  $f(x) - g(x)$

20.  $(f \circ g)(x)$

21.  $(g \circ f)(x)$

(7) For each function  $f(x)$ , find the inverse  $f^{-1}(x)$ .

22.  $f(x) = 6x + 1$

23.  $f(x) = \sqrt{x + 4}$

24.  $f(x) = 3x^2 + 1$

(8) Write each expression as a single logarithm.

25.  $3\log x + 4\log x$

26.  $\log r - \log t + 2\log s$

(8) Expand each logarithm:

27.  $\log_b 2x^2y^3$

28.  $\log_b \frac{x^2}{2y}$

(9) Simplify each rational expression. State any restrictions.

29.  $\frac{x^2 + 9x + 18}{x + 6}$

30.  $\frac{2x^2 + 5x - 3}{x^2 - 4x} \cdot \frac{2x^3 - 8x^2}{x^2 + 6x + 9}$

31.  $\frac{x^2 - 2x - 8}{x + 3} \div \frac{x - 4}{x + 3}$

(9) Add or Subtract. Simplify where possible:

32.  $\frac{6x + 1}{x + 2} + \frac{2x - 5}{2x + 4}$

33.  $\frac{2x}{x - 5} - \frac{x}{x + 7}$

(9) Variation

34. Sound intensity  $S$  varies inversely to the square of the distance  $d$  from the source. Suppose the sound intensity is 30 watts per square meter ( $W / m^2$ ) at 8 meters. What is the sound intensity at 4 meters?

Write the function model for the given variation.

35.  $w$  varies jointly with  $x$  and the square of  $y$  if  $k=5$ .

36.  $P$  varies directly with  $t$  and inversely with  $r$  if  $k=8$ .

**Solve the equation. In questions 1-4, be sure to check for extraneous solutions. The chapter the problem is from is given in parentheses.**

37. (7)  $x^{\frac{1}{2}} + 3 = 4$

38. (7)  $3\sqrt{2x+4} = 12$

39. (7)  $\sqrt[3]{x^2+9} = 3$

40. (7)  $\sqrt{x+7} = x+1$

41. (8)  $10^{2(x+1)} = 10^{5x-2}$

42. (8)  $2^{x+11} = 4^{2x+1}$

43. (8)  $7^{x-3} = 25$

44. (8)  $e^{3x} = 12$

45. (8)  $\log 3x = 1$

46. (8)  $3\ln x + \ln 5 = 7$

47. (9)  $\frac{1}{2} - x = \frac{x}{6}$

48. (9)  $\frac{2}{2x-1} = \frac{x}{3}$

49. (9)  $\frac{3}{2x} - \frac{2}{3x} = 5$

50. (9)  $\frac{2}{x+1} = 2 + \frac{6}{x+1}$

51. (8) You purchased land for \$50,000 in 1980. The value of the land increased by 4% per year. What is the value of the land in the year 2000?

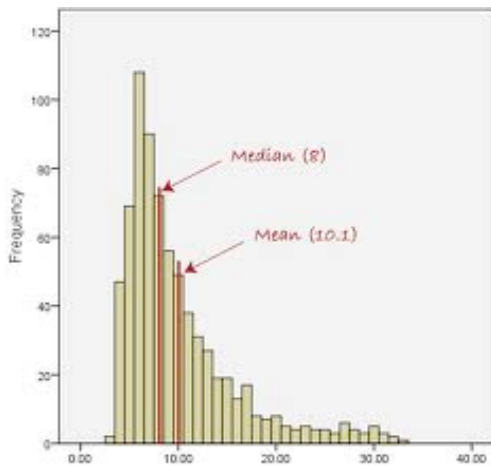
52. (8) You deposit \$1500 in a bank account. The account pays 1.75% annual interest compounded annually. What is the balance after 3 years?

53. (8) You buy a new car for \$21,000. It depreciates by 10.5% each year. Find when the car will have a value of \$17,000.

54. (8) You deposit \$850 in an account that pays 6.5% annual interest compounded continuously. What is the balance after 5 years?

## Statistics

55. Is the following normally distributed, positively skewed, or negatively skewed?



56. Sketch a normal curve and label 3 standard Deviations above and below the mean if the mean is 62 and the standard deviation is 4.5.

57. Make a box and whisker plot of the following data and then answer the questions.

72 65 51 89 93 93 86 62

- What is the range?
- What is the interquartile range?
- What is the median?