

Let  $f(x) = x^2 + 4$  and  $g(x) = 7 - x$ . Perform the indicated operation.

1.  $f(x) + g(x)$

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

3.  $f(x) \cdot g(x)$

4.  $\frac{f(x)}{g(x)}$  (state the domain)

5.  $f(g(x))$

6.  $g(f(x))$

7.  $f(g(-2))$

8.  $g(f(4))$

Find the Inverse of the function, then verify that they are inverses:

9.  $f(x) = 2x + 4$

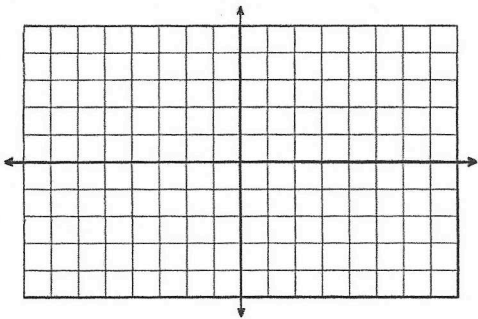
10.  $f(x) = -\frac{2}{3}x + 4$

11.  $f(x) = x^2 + 5; x \geq 0$

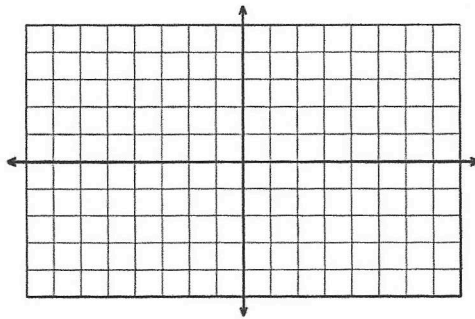
12.  $f(x) = (x - 7)^{\frac{1}{3}}$

Graph the function then state the domain and range:

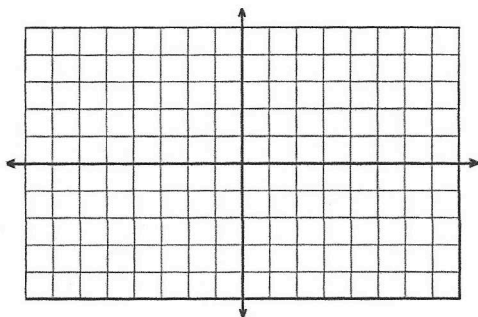
13.  $f(x) = \sqrt{x+7}$



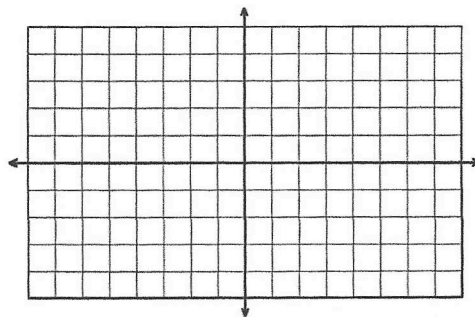
14.  $f(x) = \sqrt{x} - 1$



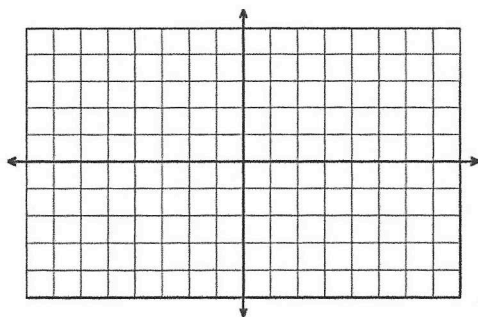
15.  $f(x) = 3 - \sqrt{x+2}$



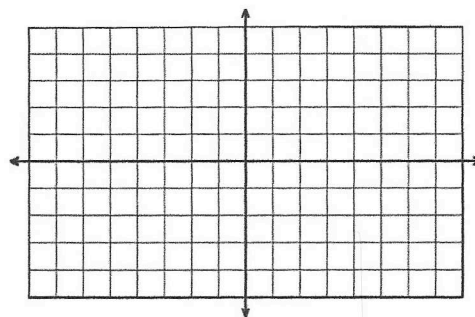
16.  $f(x) = -\sqrt{x} + 4$



17.  $f(x) = 2 + \frac{1}{2}\sqrt{y-4}$



18.  $f(x) = 3\sqrt{a+1}$



**Simplify:**

19.  $\sqrt{49x^6y^4}$

20.  $\sqrt[3]{125x^6y^9}$

21.  $2^4\sqrt{48x^2y^9z^{12}}$

22.  $6^5\sqrt{-288a^5b^{16}}$

**Simplify the expression:**

23.  $\sqrt{98} + \sqrt{2}$

24.  $\sqrt{5} + \sqrt{20} - \sqrt{27} + \sqrt{147}$

25.  $2\sqrt{32} + 4\sqrt{54} - 3\sqrt{18}$

26.  $\sqrt[3]{-32} + 3\sqrt[3]{-216} + \sqrt[3]{256}$

27.  $\sqrt{\frac{50a^5}{4b^3}}$

28.  $\sqrt[3]{\frac{81d^4}{8f^9}}$

29.  $2\sqrt{32a^3b^5} \cdot \sqrt{8a^7b^2}$

30.  $(4\sqrt{3} - \sqrt{2})(\sqrt{3} - 5\sqrt{2})$

31.  $\frac{5}{(2+\sqrt{5})}$

32.  $\frac{3}{\sqrt{x}-1}$

Write the radical using rational exponents and simplify:

33.  $\sqrt[6]{y^4}$

34.  $\sqrt[5]{32m^3}$

35.  $\sqrt[4]{162x^3}$

36.  $\sqrt[3]{-125x^2}$

Write the rational exponents using radicals and simplify:

37.  $8^{\frac{1}{3}}x^{\frac{2}{3}}$

38.  $(27b)^{\frac{2}{3}}$

39.  $(16^3d^8)^{\frac{1}{4}}$

40.  $(4^{\frac{1}{4}}g^{\frac{3}{4}})^2$

Simplify the expression:

41.  $\frac{f^{\frac{3}{2}}}{f^{\frac{3}{4}} \cdot f^{\frac{5}{4}}}$

42.  $\sqrt[3]{\sqrt{64}}$

Solve the equation:

43.  $\sqrt{x-4} = 5$

44.  $\sqrt[3]{y+2} + 3 = -1$

45.  $-\sqrt{7x-3} = 5$

46.  $2\sqrt{x+3} + 6 = 2$

47.  $\sqrt{3x} = \sqrt{x+6}$

48.  $(10k+1)^{\frac{1}{4}} = 3$

Solve the inequality:

49.  $\sqrt{2x+4} + 1 \geq 5$

50.  $\sqrt{3x+6} - 1 \leq 5$

51.  $4 - \sqrt{5y-10} \geq -1$

52.  $2 + \sqrt{3t+6} > 5$