

Identify each transformation from the parent function $f(x) = \sqrt{x}$ to g .

27. $g(x) = 4\sqrt{x}$

28. $g(x) = 3\sqrt{x}$

29. $g(x) = -\frac{1}{4}\sqrt{x}$

30. $g(x) = -\frac{1}{3}\sqrt{x}$

31. $g(x) = \sqrt{-4x}$

32. $g(x) = \sqrt{-3x}$

33. $g(x) = \sqrt{x+4}$

34. $g(x) = \sqrt{x-3}$

35. $g(x) = \sqrt{x+4}$

36. $g(x) = \sqrt{x-3}$

37. $g(x) = \sqrt{-2x+1}$

38. $g(x) = -\sqrt{x+3}$

39. $g(x) = -\sqrt{x-4} + 3$

40. $g(x) = -\sqrt{3x-1}$

41. $g(x) = -\sqrt{-x}$

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 for Exercises 42-57

Write the function for each graph described below.

42. the graph of $f(x) = |x|$ translated 4 units to the left

43. the graph of $f(x) = x^2$ translated 2 units to the right

44. the graph of $f(x) = |x|$ translated 5 units up

45. the graph of $f(x) = x^2$ translated 6 units down

46. the graph of $f(x) = x^2$ vertically stretched by a factor of 3

47. the graph of $f(x) = \sqrt{x}$ vertically compressed by a factor of $\frac{1}{3}$

48. the graph of $f(x) = x^2$ horizontally compressed by a factor of $\frac{1}{5}$

49. the graph of $f(x) = \sqrt{x}$ horizontally stretched by a factor of 4

50. the graph of $f(x) = 3x + 1$ reflected across the x -axis

51. the graph of $f(x) = 2x - 1$ reflected across the y -axis

52. the graph of $f(x) = x^2$ vertically stretched by a factor of 2 and translated 1 unit to the right

53. the graph of $f(x) = |x|$ horizontally compressed by a factor of $\frac{1}{3}$, reflected across the x -axis, and translated 3 units down

54. the graph of $f(x) = x^2$ translated 7 units to the left

55. the graph of $f(x) = x^2$ translated 5 units up

56. the graph of $f(x) = x^2$ stretched vertically by a factor of 2

57. the graph of $f(x) = x^2$ reflected across the y -axis and stretched horizontally by a factor of 2

58. How are the domain and range of a function affected by a reflection across the y -axis? across the x -axis? Include examples in your explanation.

59. Show that a vertical compression can have the same effect on a graph as a horizontal stretch.

CHALLENGES

At right is the graph of the function f . Draw a careful sketch of each transformation of f .

60. $g(x) = f(2x)$

61. $g(x) = 2f(x)$

62. $g(x) = -f(x)$

63. $g(x) = f(x+2)$

64. $g(x) = f(x) + 3$

65. $g(x) = f\left(\frac{1}{2}x\right)$

