Graph each triple on the same grid and describe the transformation(s)

In Exercises 21–24, sketch the graphs of f, g, and h by hand. Support your answers with a grapher.

22. $f(x) = x^3 - 2$

$g(x) = (x + 4)^3 - 1$

$h(x) = 2(x - 1)^3$

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

$g(x) = 2\sqrt[3]{x} - 2$

$h(x) = -\sqrt[3]{x} - 3$
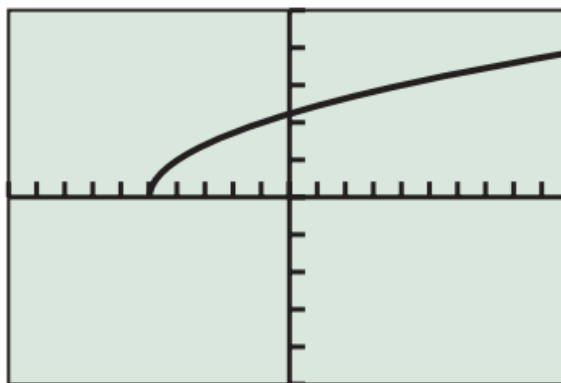
24. $f(x) = -2|x| - 3$

$g(x) = 3|x + 5| + 4$

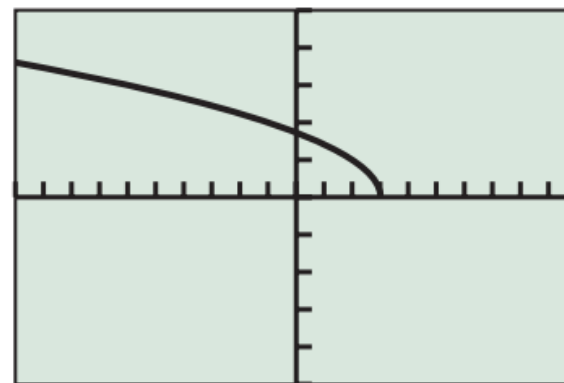$h(x) = |3x|$

Sketch the functions as well

In Exercises 25–28, the graph is that of a function $y = f(x)$ that can be obtained by transforming the graph of $y = \sqrt{x}$. Write a formula for the function f.
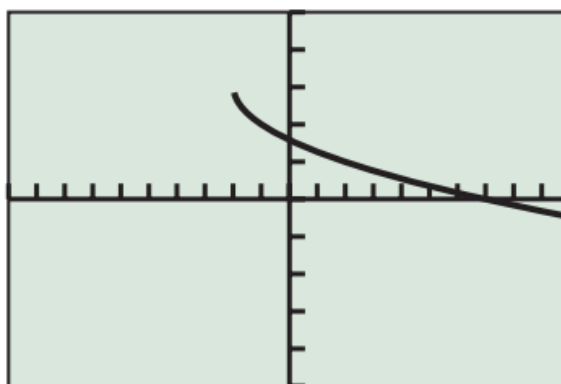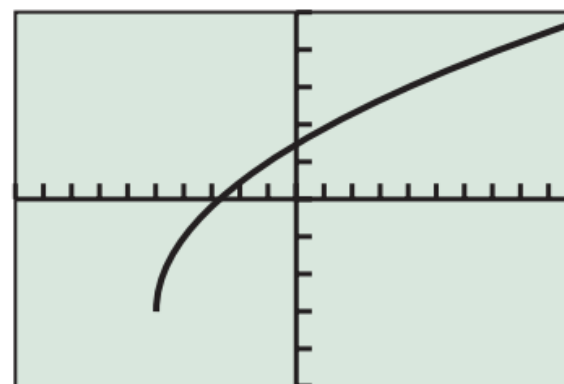
25.

$[-10, 10]$ by $[-5, 5]$

26.

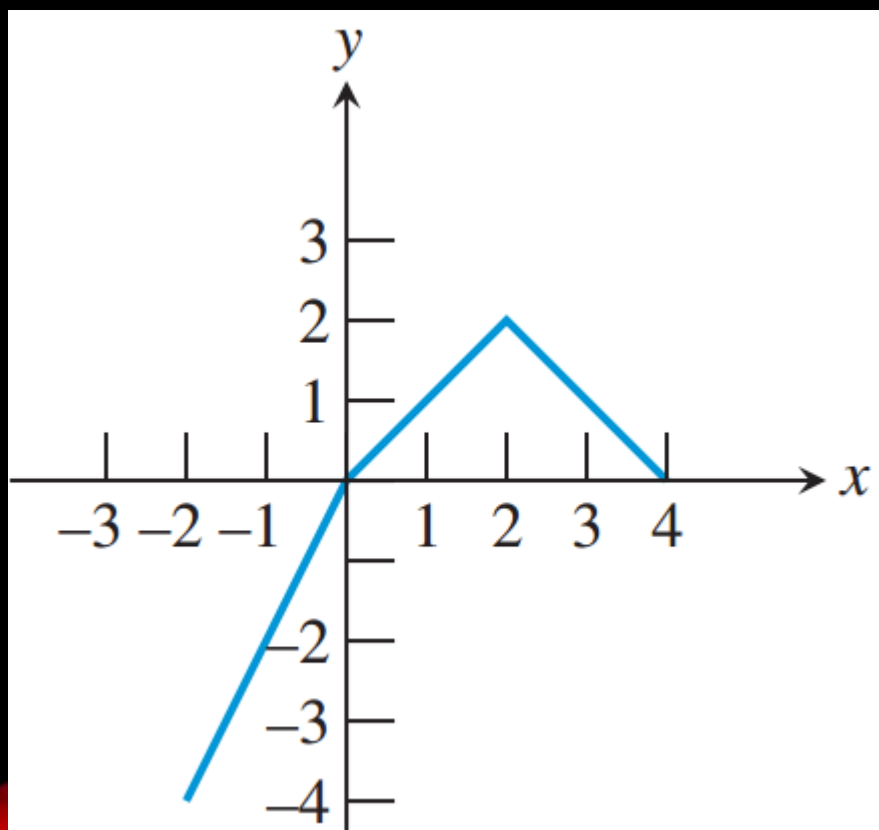$[-10, 10]$ by $[-5, 5]$

27.

$[-10, 10]$ by $[-5, 5]$

28.

$[-10, 10]$ by $[-5, 5]$

Exercises 51–54 refer to the function f whose graph is shown below.

51. Sketch the graph of $y = 2 + 3f(x + 1)$.

52. Sketch the graph of $y = -f(x + 1) + 1$.

53. Sketch the graph of $y = f(2x)$.

54. Sketch the graph of $y = 2f(x - 1) + 2$.