

**Example 1**

Let  $f$  be a cubic polynomial function for which

$$f(1) = 6 \text{ and } f(-1) = f(0) = f(2) = 0$$

Determine the value of each of the constants  $a$ ,  $b$ ,  $c$ , and  $k$  for which

$$f(x) = k(x - a)(x - b)(x - c)$$

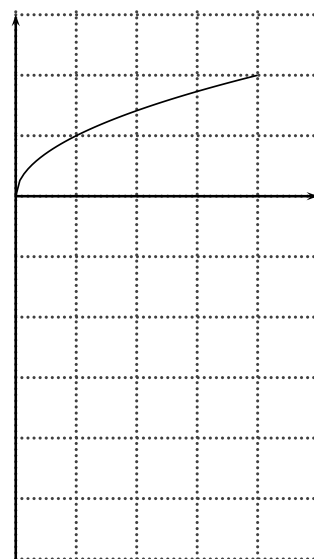
Expand the expression for the function  $f$  in expanded form.

**Example 2**

The graph of  $y = \sqrt{x}$  is shown. Use appropriate transformations to sketch the graph of

$$y = 2 - 3\sqrt{x - 1}$$

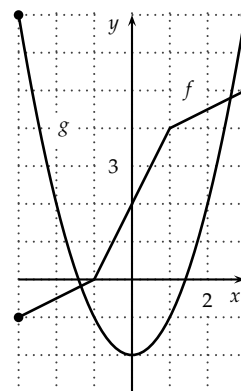
Describe each transformation and be sure to specify the order in which the transformations are applied.



**Example 3**

The graphs of the two functions  $f$  and  $g$  are shown.

- (a) Find  $g(f(0))$ .
- (b) Find  $f(g(2))$ .
- (c) Find  $(f \circ g)(1)$ .
- (d) Find  $(g \circ f)(-3)$ .



**Example 4**

The graphs of the function  $f(x) = \sqrt{c + x^2}$  for  $c = -4$ ,  $c = 0$ , and  $c = 4$  are shown. Label each graph with the correct value of  $c$ , and label both sets of axes to specify the viewing rectangle (window) used.

