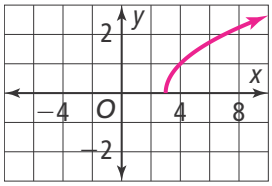
5-3 Additional Practice

Graphing Radical Functions

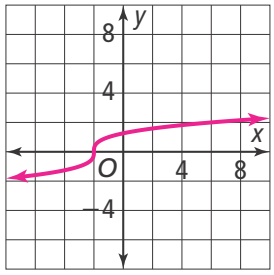
Graph the following functions, then state the domain and range. Is the function increasing or decreasing?

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



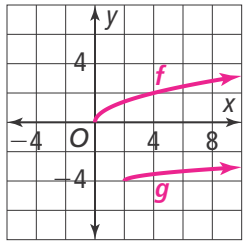
domain: $x \geq 3$; range: $y \geq 0$; increasing

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



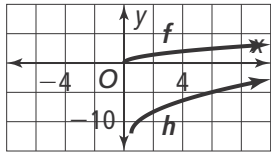
domain: all real numbers; range: all real numbers; increasing

3. Graph $f(x) = \sqrt{x}$ and $g(x) = \frac{1}{3}\sqrt{x - 2} - 4$. What transformations of the graph of f produce the graph of g? What is the effect of the transformations on the domain and range of $g(x)$?



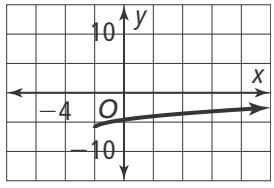
The graph of f is translated 2 units right and 4 units downward, and compressed vertically by a factor of 3. The domain of f is $x \geq 0$ while the domain of g is $x \geq 2$. The range of f is $y \geq 0$ while the range of g is $y \geq -4$.

4. What transformations of the parent graph $f(x) = \sqrt{x}$ produce the graph of $h(x) = \sqrt{9x - 4.5} - 12$?



The graph of f is translated 0.5 to the right and 12 units downward, and stretched vertically by a factor of 3.

5. What radical function is represented in the graph?



$f(x) = \sqrt{x + 2} - 6$

6. The visibility, in miles, from a certain spot on a hillside can be calculated using the function $d = \sqrt{1.5x}$, where x is the height in feet above the valley floor. Fanon walks through elevations ranging from 9 feet to 36 feet above the valley. What are the minimum and maximum distances that she can see?

minimum: 3.67 mi; maximum: 7.35 mi

7. The surface area of a paper cup is defined by the function $S(h) = 4\pi\sqrt{16 + h^2}$, where h is the height of the cup. What are domain and range of $f(x)$?

$h > 0$ and $s(h) > 16\pi$