Transforming Radicals

Sketch the transformation of $f(x) = \sqrt{x}$, then rewrite each function in the form: $g(x) = a(b(x - h))^2 + k$

1. $g(x) = \sqrt{x} + 5$
2. $g(x) = -\sqrt{x}$
3. $g(x) = \sqrt{\frac{1}{2}x}$
4. $g(x) = \sqrt{2x - 1}$
5. $g(x) = -3\sqrt{x}$
6. $g(x) = 4 - \sqrt{5 - 2x}$

Rewrite each function in the form, $g(x) = a\sqrt{b(x - h)} + k$, describe all transformations of $f(x) = x^2$ in the correct order, then sketch the function.

7. $g(x) = 5 - 2\sqrt{x + 4}$
8. $g(x) = -\sqrt{-4x + 8} + 1$
9. $g(x) = 3\sqrt{2 - x} - 7$
10. $g(x) = -\frac{1}{2}\sqrt{6x + 12} + 9$
11. $g(x) = 3 - \sqrt{2x}$
12. $g(x) = \sqrt{-x + 6} - 1$

16. Consider $f(x) = \sqrt{x}$. Two transformations are applied:
    A) Horizontal compression by factor 0.5
    B) Horizontal shift 4 units right

    Sketch the function if A is performed first and then B.
    Sketch the function if B is performed first and then A.
    Explain why the results are different.

17. Find two completely different transformations of $f(x) = \sqrt{x}$ that produce the same graph as:

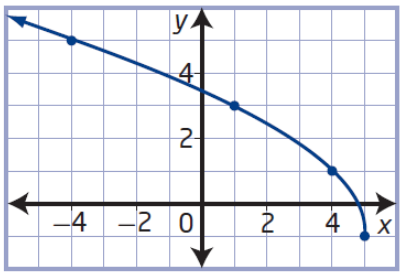
$$g(x) = -2\sqrt{x - 3} + 5$$

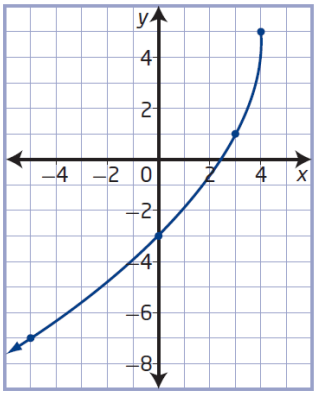
For each function: State the domain and state the range.

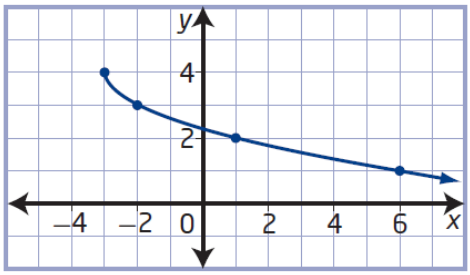
18. $g(x) = \sqrt{x - 4} + 2$
19. $g(x) = -\sqrt{-x + 5} + 3$
20. $g(x) = 4 - 3\sqrt{2x - 6}$
21. $g(x) = -2\sqrt{1 - 3x} - 7$

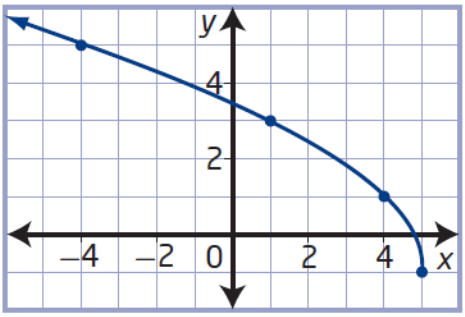
22. A radical function has endpoint (–2, 6), opens downward, and is vertically stretched by a factor of 3. Write its equation $y = a\sqrt{b(x-h)} + k$.

23. Write each function in the form $y = a\sqrt{b(x-h)} + k$ where $f(x) = \sqrt{x}$

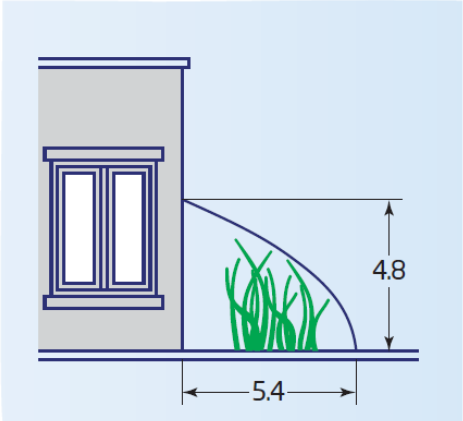








24. While meeting with a client, a manufacturer of custom greenhouses sketches a greenhouse in the shape of the graph of a radical function. What equation could the manufacturer use to represent the shape of the greenhouse roof?



25. During election campaigns, campaign managers use surveys and polls to make projections about the election results. One campaign manager uses a radical function to model the possible error in polling predictions as a function of the number of days until the election, as shown in the graph. Determine an equation to represent the function.