

## Sec. 4.1

## Translations and Transformations

**Ready:** For each function below, identify the transformations made to the parent function.

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

2.  $f(x) = |x + 2|$

3.  $f(x) = x^2 + 5$

4.  $f(x) = (x - 4)^2$

5.  $f(x) = |x - 3| + 1$

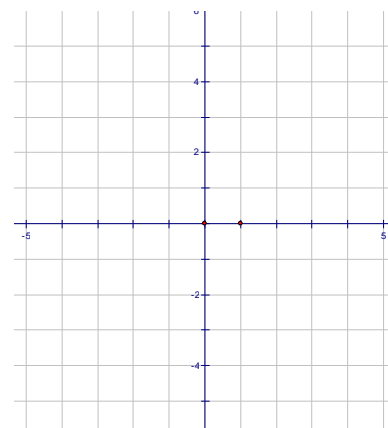
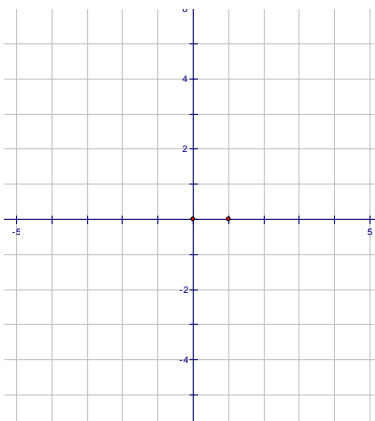
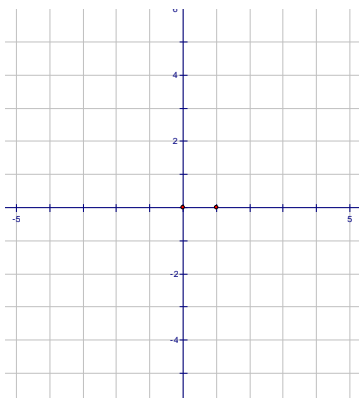
6.  $f(x) = -4\sqrt{x+1} + 2$

**Set:** Identify the transformations for each function then Sketch a graph of the function. (No Calculator)

7.  $f(x) = -\frac{2}{3}\sqrt{x-1} - 3$

8.  $f(x) = 5x^2 - 4$

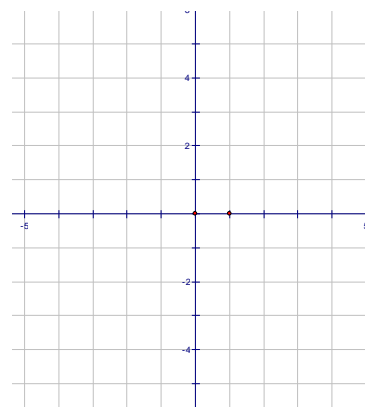
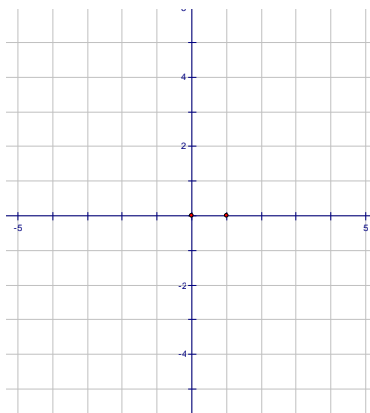
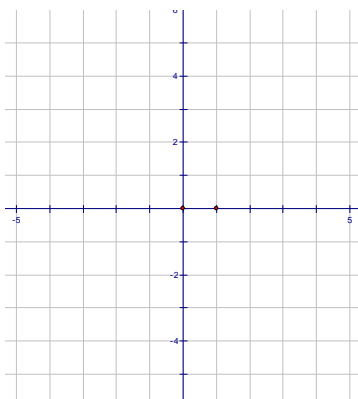
9.  $f(x) = |x + 2| - 5$



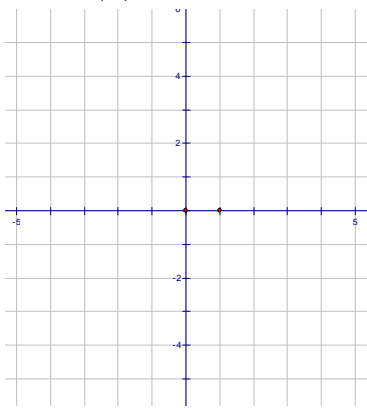
10.  $f(x) = -(x-2)^2 + 1$

11.  $f(x) = |x - 4| - 3$

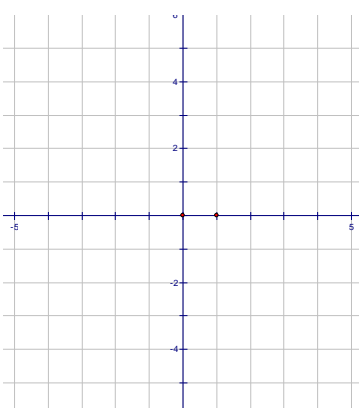
12.  $f(x) = \frac{1}{4}\sqrt{x+3}$



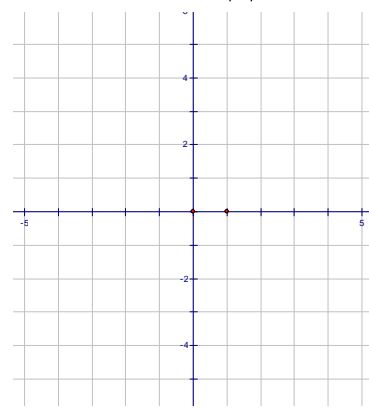
13.  $f(x) = \sqrt{9x+36} + 2$



14.  $f(x) = -(x+4)^2$



15.  $f(x) = -5|x| - 2$



Write the function with the indicated transformations. Use the given parent functions ( $|x|$ ,  $\sqrt{x}$ ,  $x^2$ )

16. An absolute value function. Vertical stretch by a factor of 3, horizontal shift left 5

17. A square root function. Reflection across the x-axis, horizontal shift right 2

18. A quadratic function. Vertical compression by a factor of  $\frac{1}{3}$ , vertical shift down 5

19. A square root function. Vertical stretch by a factor of 4, horizontal shift left 3, vertical shift up 6

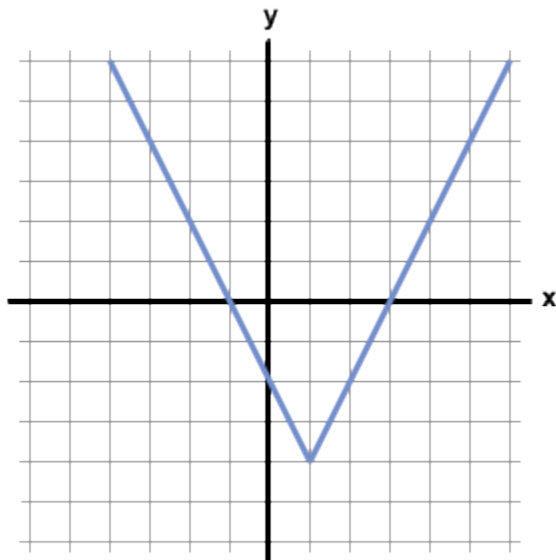
20. An absolute value function. Reflection across the x axis, horizontal shift right 1, vertical shift down 4

21. A quadratic function with a vertical compression by a factor  $\frac{1}{2}$ , a reflection across the y axis, vertical shift up 2.

22. Simplify the square root to reveal the transformation. Then describe it  $f(x) = \sqrt{4x-16} - 1$ .

Use the graphs below to identify each function. Write the function that corresponds to each graph.

23.



24.

