

### 3.5 Practice Problems

1. Write the function whose graph is the graph of  $y=x^2$ , but is:

- a. Shifted to the right 4 units
- b. Shifted to the left 2 units
- c. Shifted down 1 unit
- d. Shifted up 5 units
- e. Vertically stretched by a factor of 8
- f. Horizontally compressed by a factor of 8
- g. Reflected about the y-axis
- h. Reflected about the x-axis

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2. Find the function that is finally graphed after each of the following transformations is applied to the graph of  $y=\sqrt[3]{x}$  in the order stated.

- 1) Shift down 3 units
- 2) Shift right 1 unit
- 3) reflect over the x-axis

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3. If the point  $(2,3)$  is on the graph of  $y=f(x)$

- a. What point will be on the graph of  $y=2f(x)$  ?
- b. What point will be on the graph of  $y=f(2x)$  ?
- c. What point will be on the graph of  $y=f(x)-2$  ?
- d. What point will be on the graph of  $y=f(x-2)$  ?
- e. What point will be on the graph of  $y=f(-x)$  ?

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4. Suppose the x-intercepts of the graph of  $y=f(x)$  are  $-3$  and  $4$ .

- a. What are the x-intercepts of the graph of  $y=f(x+1)$  ?
- b. What are the x-intercepts of the graph of  $y=f(-x)$  ?
- c. What are the x-intercepts of the graph of  $y=3f(x)$  ?

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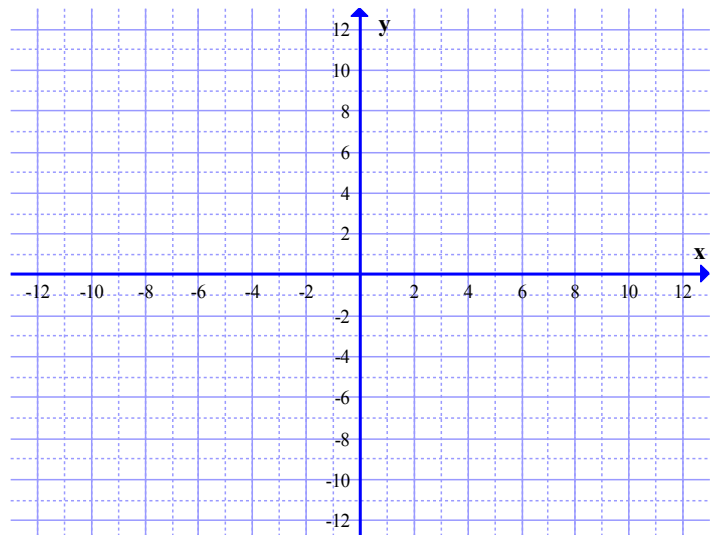
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5. Graph the function using the techniques of shifting, compressing, stretching, and/or reflecting.

$$f(x)=|x|-4$$

What transformation was used?

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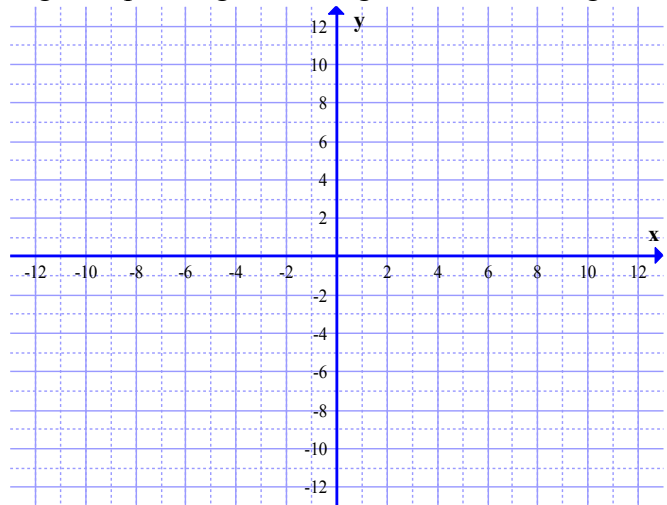
6. Graph the function using the techniques of shifting, compressing, stretching, and/or reflecting.

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

What transformations were used?

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7. Graph the function using the techniques of shifting, compressing, stretching, and/or reflecting.

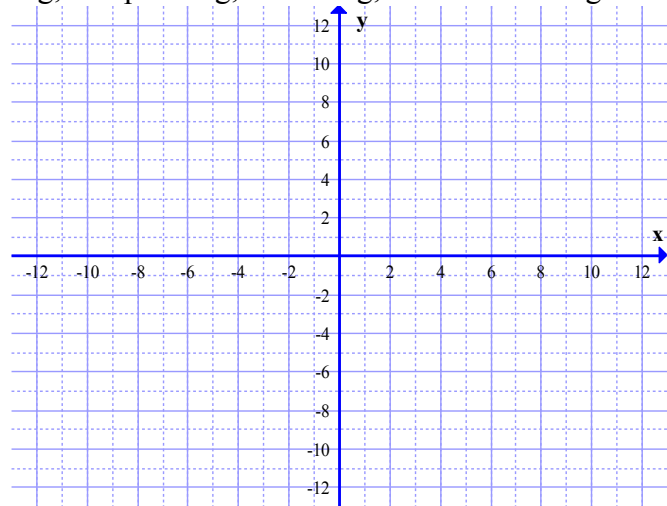
$$f(x) = -\sqrt{x-2} + 1$$

What transformations were used?

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8. Graph the function using the techniques of shifting, compressing, stretching, and/or reflecting.

$$f(x) = \frac{2}{x+2} - 3$$

What transformations were used?

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