ASSESSMENT#3-Chapter 1.7-1.10

Directions: Provide complete responses to each question. Make sure to show all your work.

1.
Write an equation for the function that is described by the given characteristics.

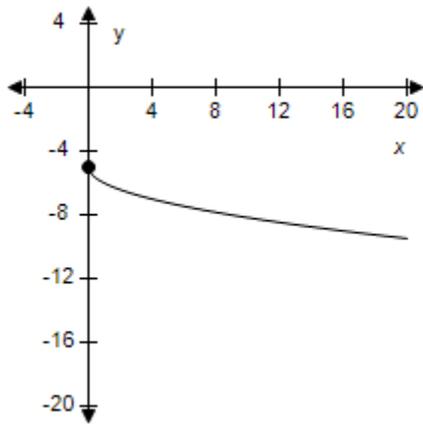The shape of $f(x) = x^2$, but shifted four units to the left and four units upward.

2. Write an equation for the function that is described by the given characteristics.

The shape of $f(x) = \sqrt{x}$, but shifted two units to the left and reflected in both the *x*-axis and the *y*-axis.

3. Use the viewing window shown to select a possible equation for the transformation of the parent function.
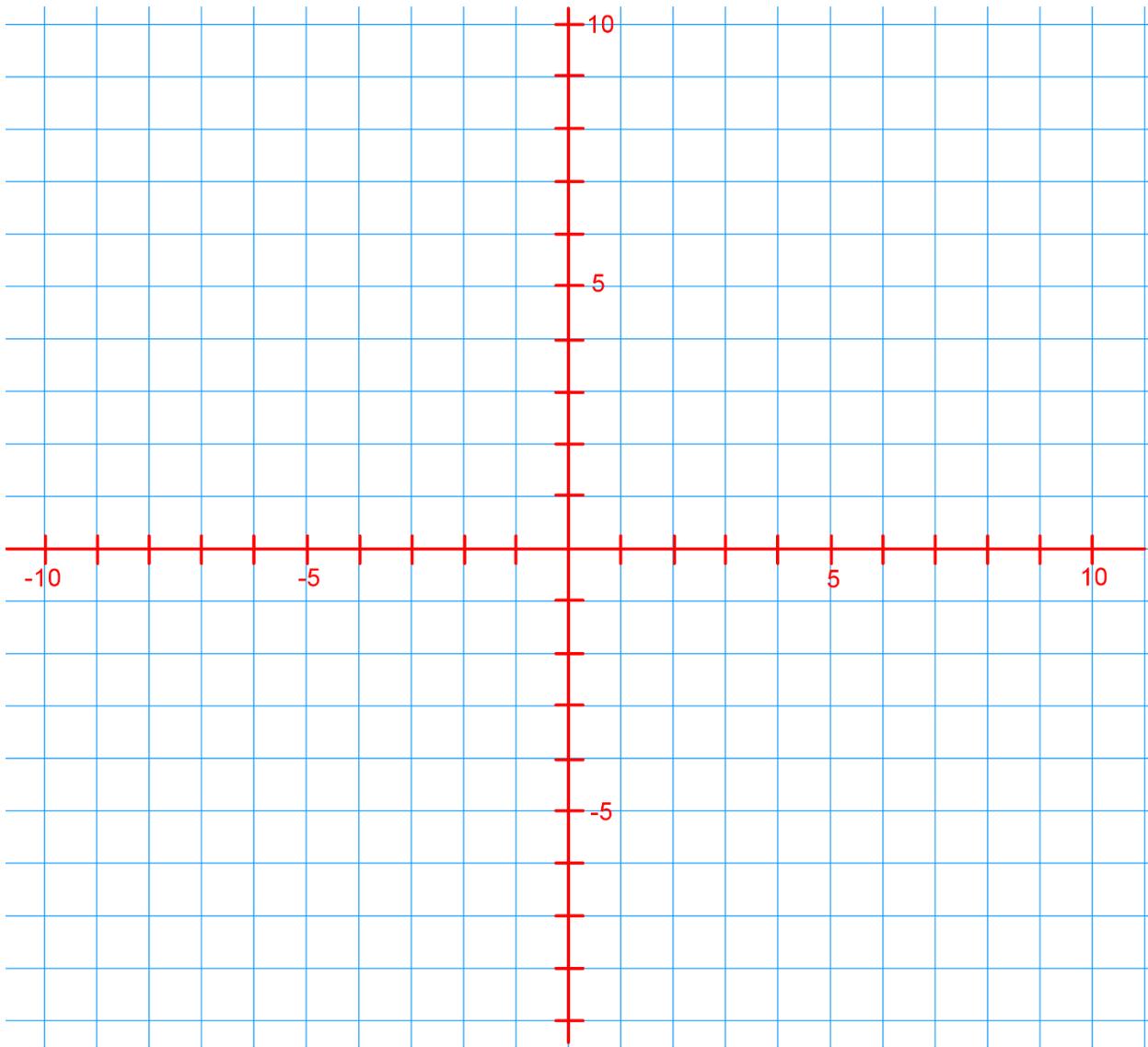
a. $y = \sqrt{x} - 5$

b. $y = -\sqrt{x} + 5$

c. $y = -\sqrt{x} - 5$

d. $y = \sqrt{x} + 5$

e. $y = -\sqrt{x} - 6$

4. Find and graph $(f + g)(x)$.

$f(x) = x + 4,\ g(x) = x - 4$

.5.   Find and graph $(fg)(x)$.

$f(x) = x^2, g(x) = 7x - 7$
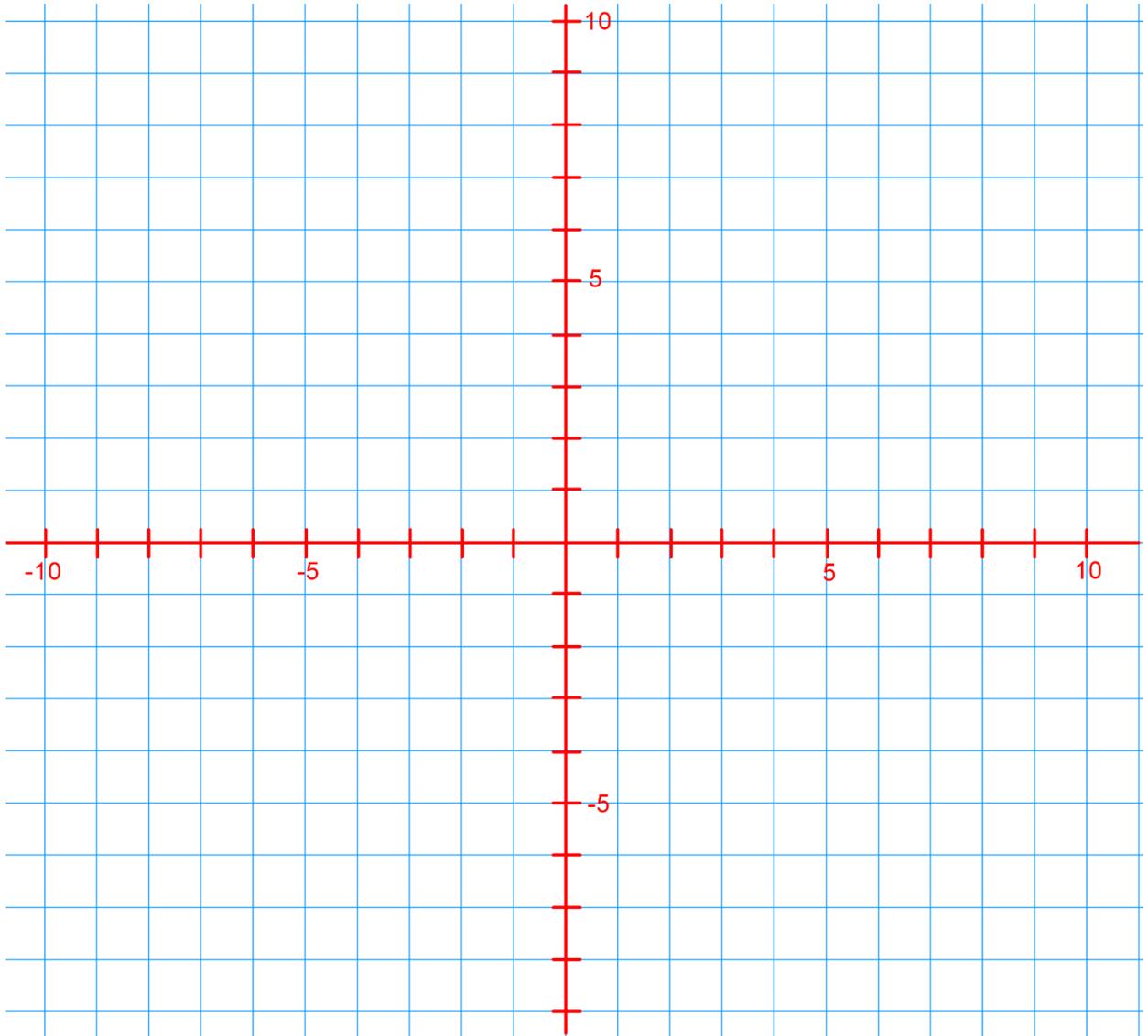
5. Find the indefinite integral of the following functions:

    a. $f(x) = 7x^2$

$$\int 7x^2\, dx$$

    b. $f(x) = 5x^3 + 4x + 3$

$$\int (5x^3 + 4x + 3)\, dx$$

c. $f(x) = (3x + 4)^2$

$$\int (3x + 4)^2 \, dx$$

$Hint: Expand \ the \ function \ then \ integrate$

6. Find the indefinite integral of the following functions:

a. $f(x) = 3x^2$

$$\int_1^3 3x^2 \, dx$$

b. $f(x) = 4x^3 + 6x^2 + 2x + 1$

$$\int_0^2 (4x^3 + 6x^2 + 2x + 1)\, dx$$

c. $f(x) = 6x^2 + 4x + 2$

$$\int_3^5 (6x^2 + 4x + 2)\, dx$$

7. Find the inverse function of $f(x)$ for the following:

    a. $f(x) = 6x$

    b. $f(x) = x - 5$

    c. $f(x) = x^8$

8. Assume that y is directly proportional to x. Use the given x-value and y-value to find a linear model that relates y and x.

9. Property tax is based on the assessed value of a property. A house that has an assessed value of $100,000 has a property tax of $4,920. Find a mathematical model that gives the amount of property tax y in terms of the assessed value x of the property. Use the model to find the property tax on a house that has an assessed value of $230,000. (Round your answer to four decimal places.)

10. The coiled spring of a toy supports the weight of a child. The spring is compressed a distance of 1.6 inches by the weight of a 35-pound child. The toy will not work properly if its spring is compressed more than 6 inches. What is the weight of the heaviest child who should be allowed to use the toy? (Round your answer to two decimal places.)