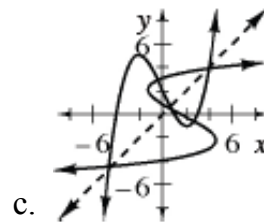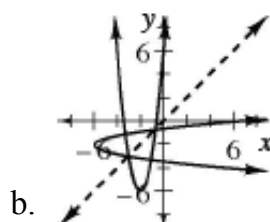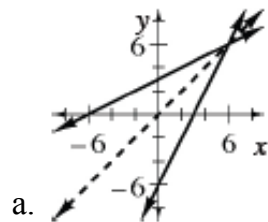# Lesson 5.1.2

5-16. See below:

a. See graphs with inverses in problem 5-17.

b. Sample answer: The x- and y-values switch in a table for a function and the table for its inverse.
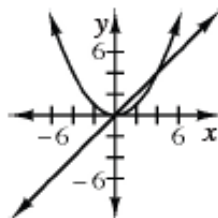
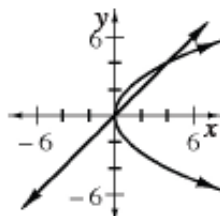**5-17. See below:**

a. See graphs below.

b. $y = x$

c. Answers vary. Sample: This equation makes sense because the x- and y-values switch between a function and its inverse.

5-18. See below:

a. See graph below.

b. See graph above.

c. Students make a copy of their parabola.
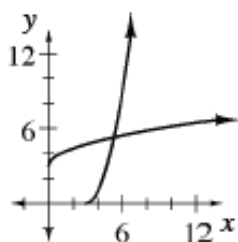
d. See graph below.

5-20. $x = \left(\frac{y}{2}\right)^2$ or $y = \pm 2\sqrt{x}$

5-21. See below:

a. The inverse is not a function. For a given input value there is more than one output. For example if $x = 1$, y could be either 2 or –2.

b. The inverse is a function.

c. $y = 2\sqrt{x}$. The equation now includes only the positive square root.

5-22. See below:

a. Teams could choose either $x \geq 3$ or $x \leq 3$.
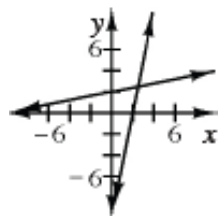
b. See sample graph below.

c. Depending on the choice in part (a), the inverse is $y = \sqrt{x} + 3$ or $y = -\sqrt{x} + 3$.
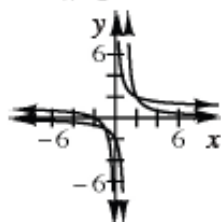
5-23. If the graph has more than one x-value that corresponds to each y-value, the inverse will *not* be a function. Examples include $y = x^3 - x$.

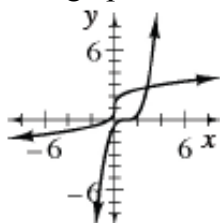**5-24. See below:**

a. $y = \frac{x}{5} + 2$

b. $y = \frac{2}{x-1}$

5-25. It does not matter which graph is labeled as the function or inverse because the graph shows the graphical relationship between a function and its inverse, the graphs are inverses of each other.

────── Review & Preview ──────

5-26. See graph below.

5-27. See below:

a. $y = \frac{1}{3}(x + 8)$

b. $y = 2(x - 6)$

c. $y = 2x - 6$

5-28. $x \approx 0.53$
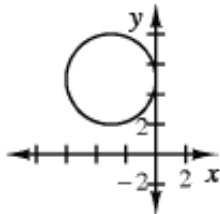
5-29. See below:

a. $x^2 - 5x - 14$

b. $6m^2 + 11m - 7$

c. $x^2 - 6x + 9$

d. $4y^2 - 9$

5-30. $(x + 3)^2 + (y - 5)^2 = 9$. See graph below.

5-31. See below:

a. $\dfrac{x-3}{x(x-4)}$
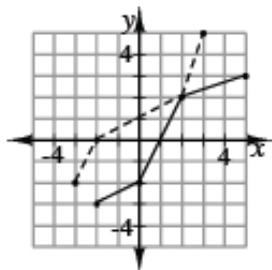
b. $\dfrac{4}{x-2}$

c. 2

d. $\dfrac{x-1}{x+1}$

5-32. See below:

  a. $f(x) \approx 1.5(1.048)^x$

  b. ~ \$425.04

5-33. See graph below. For $f(x)$, domain: $-2 \le x \le 5$, range: $-3 \le y \le 3$; For $f^{-1}(x)$, domain: $-3 \le x \le 3$, range: $-2 \le y \le 5$

5-34. See below:

  a. $L(x) = x^2 - 1$, $R(x) = 3(x + 2)$

  b. 30

  c. Order does matter – show by substituting numbers; output is 224 if $x = 3$ for $L(R(x))$.

5-35. See below:

  a. The system has no solution.

  b. The graphs do not intersect, they are parallel lines.

5-36. If she adds nothing else to the account and it just sits there making interest, she will have \$440.13 on her eighteenth birthday.

5-37. See below:

  a. $x^2 - 10x - 56$

  b. $4m^2 + 8m - 5$

  c. $x^2 - 81$

d. $9y^2 + 12y + 4$

5-38. See below:

a. $(2, 0), (-1, 0)$

b. $(-5, 0), (-3, 0)$

5-39. $x = 2.5$