Answers

11. a. $f(g(x)) = 3x^2 - 12x + 12$; all real numbers

   b. $g(f(x)) = 3x^2 - 2$; all real numbers

   c. $f(f(x)) = 27x^4$; all real numbers

12. a. $f(g(x)) = \dfrac{5}{3x - 6}$; all real numbers except $x = 2$

   b. $g(f(x)) = \dfrac{15}{x} - 6$; all real numbers except $x = 0$

   c. $f(f(x)) = x$; all real numbers except $x = 0$

13. a. $f(g(x)) = \dfrac{7}{x^2 - 1}$; all real numbers except $x = -1$ and $x = 1$

   b. $g(f(x)) = \dfrac{49}{x^2} - 1$; all real numbers except $x = 0$

   c. $f(f(x)) = x$; all real numbers except $x = 0$

14. a. $f(g(x)) = 2\sqrt{x - 5} + 3$; $x \geq 5$

   b. $g(f(x)) = \sqrt{2x - 2}$; $x \geq 1$

   c. $f(f(x)) = 4x + 9$; all real numbers

5.6 Enrichment and Extension

a. $f(x) = s(q(x))$ **b.** $f(x) = q(s(q(x)))$

c. $f(x) = h(x) + q(x)$ **d.** $f(x) = g(p(h(x)))$

e. $f(x) = r(h(x))$ **f.** $f(x) = q(s(x))$

g. $f(x) = s(x) \bullet p(x)$ **h.** $f(x) = r(x) - g(x)$

i. $f(x) = h(r(x))$ **j.** $f(x) = r(x) \bullet t(x)$

k. $f(x) = \dfrac{g(x)}{t(x)}$ **l.** $f(x) = \dfrac{r(x)}{g(x)}$

m. $f(x) = h(x) + r(x)$ **n.** $f(x) = h(g(s(x)))$

o. $f(x) = q(v(s(x)))$ or $f(x) = v(s(q(x)))$

p. $f(x) = q(v(h(x)))$

5.6 Puzzle Time

IT WAS BELOW C LEVEL

5.7 Cumulative Practice

1. $5i\sqrt{2}$ **2.** $4i\sqrt{2}$

5.7 Prerequisite Skills Practice

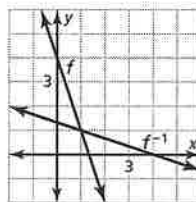**1.** $y = -\dfrac{5}{6}x + \dfrac{3}{2}$ **2.** $y = -4x + 7$
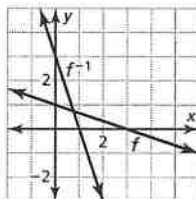
5.7 Extra Practice

1. $x = -\dfrac{3}{4}y + \dfrac{3}{2}$; $x = \dfrac{15}{4}$

2. $x = \dfrac{\sqrt[4]{25y}}{5}$; The output cannot be -3.
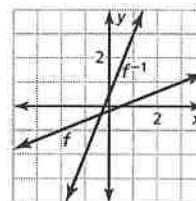
3. $x = \pm\sqrt{y + 4} + 3$; $x = 2$, $x = 4$

4. $f^{-1}(x) = \dfrac{-x + 4}{3}$

5. $f^{-1}(x) = -3x + 3$

6. $f^{-1}(x) = \dfrac{5}{2}x + \dfrac{1}{2}$

Answers

7. After switching the positions of x and y, y was not solved for.
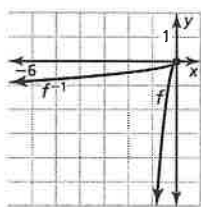
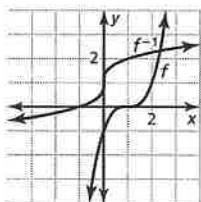$$f(x) = 3x - 8$$
$$y = 3x - 8$$
$$x = 3y - 8$$
$$x + 8 = 3y$$
$$y = \frac{x + 8}{3}$$
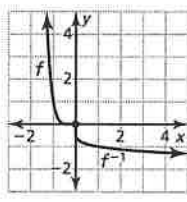$$f^{-1}(x) = \frac{x + 8}{3}$$

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

9. $f^{-1}(x) = \sqrt[3]{x} + 1$ **10.** $f^{-1}(x) = -\sqrt[6]{x}$

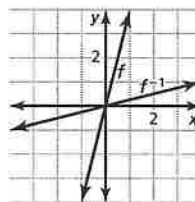**11.** no   **12.** yes   **13.** yes   **14.** no

15. $f^{-1}(x) = \dfrac{\sqrt[3]{x}}{2}$; *Sample answer:* switching the positions of x and y and solving for y; less mental math

16. a. $r = \sqrt[3]{\dfrac{3V}{4\pi}}$; The new equation represents the radius in terms of the volume.
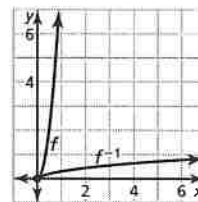
  b. $r = 3.27\,\text{m}$

5.7 Reteach
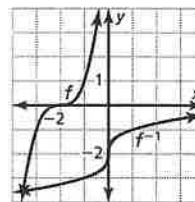
1. $x = \dfrac{y - 3}{2}$; $x = -3$

2. $f^{-1}(x) = \dfrac{x}{4}$ **3.** $f^{-1}(x) = \dfrac{\sqrt{x}}{3}$

4. $f^{-1}(x) = \sqrt[3]{x} - 2$ **5.** yes

5.7 Enrichment and Extension

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

2. $f^{-1}(x) = -4 + \sqrt{x + 16}$

3. $f^{-1}(x) = \dfrac{3}{2} + \sqrt{x + \dfrac{9}{4}}$

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

5. $f^{-1}(x) = 6 + \sqrt{x + 41}$

6. $f^{-1}(x) = -5 + \sqrt{x + 10}$

7. $f^{-1}(x) = -3 + \sqrt{x + 8}$

8. $f^{-1}(x) = 2 + \sqrt{x - 8}$

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

10. $f^{-1}(x) = -1 + \sqrt{\dfrac{x + 6}{6}}$

11. $f^{-1}(x) = 2 + \sqrt{\dfrac{x + 31}{4}}$

12. $f^{-1}(x) = 1 + \sqrt{\dfrac{x + 4}{9}}$

5.7 Puzzle Time

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