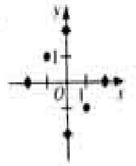
25. Let a = cost, in dollars, of an adult ticket, c = cost, in dollars, of a child's ticket;
$\begin{matrix} 2a + c = 20 \\ a + 2c = 16 \end{matrix}$; $c = 20 - 2a$; $a + 2(20 - 2a) = 16$; $a + 40 - 4a = 16$; $-3a = -24$; $a = 8$;
an adult's ticket costs \$8

26. $f(g(2)) = f(|2(2) - 7|) = f(|-3|) = f(3) = 4 - (3)^2 = 4 - 9 = -5$;
$g(f(2)) = g(4 - (2)^2) = g(4 - 4) = g(0) = |2(0) - 7| = |-7| = 7$

27. $m = \frac{-4 - 2}{1 - (-3)} = \frac{-6}{4} = -\frac{3}{2}$; $h(x) = -\frac{3}{2}x + b$; $h(1) = -\frac{3}{2}(1) + b = -4$; $b = -\frac{5}{2}$;
$h(x) = -\frac{3}{2}x - \frac{5}{2}$; $h(7) = -\frac{3}{2}(7) - \frac{5}{2} = -\frac{26}{2} = -13$

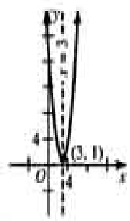
28. 

not a function

Pages 348–349 • CUMULATIVE REVIEW (Ch. 4-7)

1. $6x^2 - 8x + 2 - 5x^2 - x + 6 = x^2 - 9x + 8$ 2. $-12a^5b^3$ 3. $x^5y^4z^{12}$
4. $8y^2 + 20y - 6y - 15 = 8y^2 + 14y - 15$ 5. $(2x - 3)(x - 4)$
6. $x(3x - 2) + 2y(3x - 2) = (x + 2y)(3x - 2)$ 7. $(4a - 3b)(4a + 3b)$
8. $3y^2(y^2 - 2y - 3) = 3y^2(y - 3)(y + 1)$
9. $(x - 4)(x + 1) = 0$; $x = 4$ or $x = -1$; $\{-1, 4\}$
10. $x^2 - 10x + 25 = 0$; $(x - 5)^2 = 0$; $x = 5$; $\{5\}$
11. $x^3 = 9x$; $x^3 - 9x = 0$; $x(x^2 - 9) = 0$; $x(x - 3)(x + 3) = 0$; $x = 0$, $x = 3$ or $x = -3$
$\{-3, 0, 3\}$
12. $y^2 + y < 20$; $y^2 + y - 20 < 0$; $(y + 5)(y - 4) < 0$; $\{y: -5 < y < 4\}$
13. Let the integers be n and $n + 2$; $n(n + 2) = 99$; $n^2 + 2n - 99 = 0$;
$(n - 9)(n + 11) = 0$; $n = 9$ or $n = -11$; the numbers are 9 and 11 or -11 and -9
14. Let x = the length, in cm, of the hypotenuse; $(x - 8)^2 + (x - 1)^2 = x^2$;
$x^2 - 16x + 64 + x^2 - 2x + 1 = x^2$; $x^2 - 18x + 65 = 0$; $(x - 13)(x - 5) = 0$;
$x = 5$ (reject since $x > 8$) or $x = 13$; 13 cm
15. $\frac{12x^3y}{16x^2y^4} = \frac{3x}{4y^3}$ 16. $(x^{-3}y^2)(x^{-4}y^2) = x^{-7}y^4 = \frac{y^4}{x^7}$ 17. $\frac{a(a - 1)}{(a + 2)(a - 1)} = \frac{a}{a + 2}$
18. $\frac{18x^2}{(x - 4)(x + 2)} \cdot \frac{(x - 3)(x + 2)}{12x} \cdot \frac{x - 4}{3(x - 3)} = \frac{x}{2}$
19. $\frac{1}{2(y + 2)} + \frac{1}{y(y + 2)} = \frac{y + 2}{2y(y + 2)} = \frac{1}{2y}$
20. $\frac{1 - \frac{1}{m^2}}{\frac{1}{m} - 1} = \frac{m^2 - 1}{m - m^2} = \frac{(m - 1)(m + 1)}{-m(m - 1)} = \frac{m + 1}{-m} = -\frac{m + 1}{m}$

21. $\frac{x}{x + 2} - \frac{1}{x + 1} = \frac{2}{(x + 2)(x + 1)}$; $x(x + 1) - (x + 2) = 2$; $x^2 + x - x - 2 = 2$;
$x^2 = 4$; $x = -2$ (reject) or $x = 2$; $\{2\}$
22. $y + \sqrt{y - 1} = 7$; $\sqrt{y - 1} = 7 - y$; $y - 1 = 49 - 14y + y^2$; $y^2 - 15y + 50 = 0$;
$(y - 5)(y - 10) = 0$; $y = 5$ or $y = 10$ (reject); $\{5\}$
23. Let x = dollars invested at 5%; $0.05x + 0.08(4000 - x) = 284$; $-0.03x + 320 = 284$;
$-0.03x = -36$; $x = 1200$; he invested \$1200 at 5% and \$2800 at 8%
24. $4\sqrt{5}$ 25. $2\sqrt{6} - \frac{\sqrt{6}}{2} = \frac{3\sqrt{6}}{2}$ 26. $21 + 28\sqrt{5} - 3\sqrt{5} - 20 = 1 + 25\sqrt{5}$
27. $\frac{2}{\sqrt{7} - \sqrt{3}} \cdot \frac{\sqrt{7} + \sqrt{3}}{\sqrt{7} + \sqrt{3}} = \frac{2(\sqrt{7} + \sqrt{3})}{7 - 3} = \frac{\sqrt{7} + \sqrt{3}}{2}$
28. $(2i\sqrt{2})(i\sqrt{6}) = -2\sqrt{12} = -4\sqrt{3}$
29. $\frac{3 - 2i}{3 + 2i} \cdot \frac{3 - 2i}{3 - 2i} = \frac{9 - 12i - 4}{9 + 4} = \frac{5 - 12i}{13} = \frac{5}{13} - \frac{12}{13}i$
30. Let $N = 0.1\overline{54}$; then $100N = 15.4\overline{54}$ and $99N = 15.3$; $N = \frac{15.3}{99} = \frac{17}{110}$
31. $4x^2 - 12x + 7 = 0$; $4(x^2 - 3x) = -7$; $4\left(x^2 - 3x + \frac{9}{4}\right) = -7 + 9$; $4\left(x - \frac{3}{2}\right)^2 = 2$;
$\left(x - \frac{3}{2}\right)^2 = \frac{1}{2}$; $x - \frac{3}{2} = \pm\frac{\sqrt{2}}{2}$; $x = \frac{3}{2} \pm \frac{\sqrt{2}}{2}$; $\left\{\frac{3 \pm \sqrt{2}}{2}\right\}$
32. $9y^2 + 12y + 5 = 0$; $y = \frac{-12 \pm \sqrt{144 - 180}}{18} = \frac{-12 \pm 6i}{18} = \frac{-2 \pm i}{3}$; $\left\{-\frac{2}{3} \pm \frac{1}{3}i\right\}$
33. $D = 36 - 12k$; $36 - 12k < 0$; $36 < 12k$; $k > 3$
34. $(4x - 3)^2 - 6(4x - 3) + 5 = 0$; let $z = 4x - 3$; $z^2 - 6z + 5 = 0$;
$(z - 5)(z - 1) = 0$; $z = 5$ or $z = 1$; $x = \frac{z + 3}{4}$; $x = 2$ or $x = 1$; $\{1, 2\}$

35. 

36. D = {real numbers}; $-\frac{b}{2a} = \frac{8}{2} = 4$; $f(4) = 16 - 32 + 9 = -7$; since $a > 0$, -7 is the minimum; $R = \{y: y \geq -7\}$; $0 = x^2 - 8x + 9$; $x = \frac{8 \pm \sqrt{64 - 36}}{2} = 4 \pm \sqrt{7}$; zeros are $4 + \sqrt{7}$ and $4 - \sqrt{7}$
37. Let the numbers be x and $(x + 6)$, and let their product be $p(x) = x(x + 6) =$
$x^2 + 6x$; minimum value of p occurs when $x = -\frac{6}{2} = -3$; $p(-3) = -3(3) = -9$;
since $a > 0$, -9 is the minimum product