Answers to Odd-Numbered Exercises Not Asking for Definitions or Proofs

SECTION 0

1. $\{-\sqrt{3}, \sqrt{3}\}$
3. $\{1, -1, 2, -2, 3, -3, 4, -4, 5, -5, 6, -6, 10, -10, 12, -12, 15, -15, 20, -20, 30, -30, 60, -60\}$
5. Not a set (not well defined). A case can also be made for the empty set $\varnothing$.
7. The set $\varnothing$
9. The set $\mathbb{Q}$
11. $(a, 1), (a, 2), (a, c), (b, 1), (b, 2), (b, c), (c, 1), (c, 2), (c, c)$
13. Draw the line through P and x, and let y be the point where it intersects the line segment CD.
17. Conjecture: $n(\mathscr{P}(A)) = 2^s$. (Proofs are usually omitted from answers.)
21. $10^2, 10^5, 10^{\aleph_0} = 12^{\aleph_0} = 2^{\aleph_0} = |\mathbb{R}|$. (The numbers x where $0 \le x \le 1$ can be written to base 12 and to base 2 as well as to base 10.)
23. 1   25. 5   27. 52
29. Not an equivalence relation
31. An equivalence relation; $\bar{0} = \{0\}, \bar{a} = \{a, -a\}$ for each nonzero $a \in \mathbb{R}$
33. An equivalence relation;
    $\bar{1} = \{1, 2, \cdots, 9\}$,
    $\overline{10} = \{10, 11, \cdots, 99\}$,
    $\overline{100} = \{100, 101, \cdots, 999\}$, and in general
    $\overline{10^n} = \{10^n, 10^n + 1, \cdots, 10^{n+1} - 1\}$
35. i. $\{1, 3, 5, \cdots\}, \{2, 4, 6, \cdots\}$
     ii. $\{1, 4, 7, \cdots\}, \{2, 5, 8, \cdots\}, \{3, 6, 9, \cdots\}$
     iii. $\{1, 6, 11, \cdots\}, \{2, 7, 12, \cdots\}, \{3, 8, 13, \cdots\}, \{4, 9, 14, \cdots\}, \{5, 10, 15, \cdots\}$
37. The name *two-to-two function* suggests that such a function f should carry every pair of distinct points into two distinct points. Such a function is one to one in the conventional sense. (If the domain has only one element, a function cannot fail to be two to two, since the only way it can fail to be two to two is to carry two points into one point, and the set does not have two points.) Conversely, every function that is one to one in the conventional sense carries any pair of points into two distinct points. Thus the functions conventionally called one to one are precisely those that carry two points into two points, which is a much more intuitive unidirectional way of regarding them. Also, the standard way of trying