Section 1.3: Operations on Sets

Exercise Answers

1. F
2. T
3. T
4. T
5. F
6. F
7. F
8. T
9. F
10. D
11. {2, 3, 4, 5, 6, 7, 8}
12. {3, 5}
13. N
14. {2, 3, 4, 5, 6, 8}
15. F
16. $\varnothing$
17. {1, 2, 3, … 8}
18. $\varnothing$
19. $\varnothing$
20. $\subseteq$
21. $\cup$
22. {1, 3, 5, 7, 8, 9, 10}

23. {1, 3, 5, 7, 9, 10}

24. {1, 2, 4, 6, 7, 8, 9, 10}

25. {1, 2, 3, 5, 6, 7, 8, 9, 10}

26. $\overline{B}$

27. U

28. A∪B={2, 3, 4, 5, 6}, so $\overline{A \cup B}$ = {1, 7, 8, 9, 10} – no, this is not the same as $\overline{A} \cup \overline{B}$, but <u>is</u> the same as $\overline{A} \cap \overline{B}$.

29. $\overline{A}$ = {1, 3, 5, 7, 8, 9, 10}, $\overline{A} \cap B$={3,5}, $\left(\overline{A} \cap B\right) \cup A$ ={2, 3, 4, 5, 6}

30. You can write out all the sets if you insist, but it's easier to just say that $C \cup \overline{C} = U$ and $\overline{B} \cup \varnothing = \overline{B}$, so $\overline{C \cup \overline{C}} = \varnothing$ and $\overline{\overline{B} \cup \varnothing} = B$, and since $\varnothing \cup B = B$, $\overline{C \cup \overline{C}} \cup \overline{\overline{B} \cup \varnothing} = B$ also.

31. {*x* | *x* is an even integer}

32. C

33. D

34. ∅

35. $\overline{E}$

36. $\overline{E}$

37. False, since (1, 2, 3 …) is not a set – you need set braces {}, not round brackets ().

38. False. B is a subset of A, but it isn't an **element** of A.

39. False. 5 is not a set, so it cannot be a proper subset. (It **is** an element of A, sure.)

40. False. The intersection of B and C is the empty set, but {∅} isn't the empty set – it's a set **containing** the empty set.

Yes, the last four questions are all about notation. Yes, they're evil.