Math 2513 homework

1. (due 1/26) 1.1 # 5, 9, 11, 13, 16, 17

2. (1/26) 1.2 # 5, 6, 12, 21

3. (1/26) Use the method of arguing the contrapositive to prove that if n^2 is odd, then n is odd.

4. (2/2) 1.3 # 5, 10, 12, 13, 14, 21, 31, 33, 34

5. (2/2) 1.4 # 6, 7, 19, 21-24, 26, 27, 31

6. (2/14) 1.5 # 20a), 21a), 23, 24, 26, 33, 40, 42

7. (2/14) 1.5 # 20c), 21c), 26-30, 32

8. (2/14) 1.5 # 54, 57

9. (2/28) 1.6 # 7-9 (Of course, reasons must be given, not just "True" or "False". Also, treat $\subset$ as $\subseteq$. This may make some of your answers may be different from the book's, for example in 7f).)

10. (2/28) 1.6 # 2, 4-6, 9

11. (2/28) 1.6 # 10-15, 17

12. (2/28) 1.7 # 3, 4, 8, 9, 15, 19, 21 (formal proofs not necessary, intuitive explanations OK), 22 (give counterexamples)

13. (3/9) Observe that $\{\emptyset\} \times \{a, b\} = \{(\emptyset, a), (\emptyset, b)\}$. Similarly, write out the elements of each of the following sets:
(a) $\{\emptyset, \{\emptyset\}\} \times \{a, b\}$
(b) $\mathcal{P}(\{\emptyset, \{\emptyset\}\}) \times \mathcal{P}(\{a, b\})$

14. (3/9) 1.8 # 3-5 (for the definition and examples of bit strings, see Definition 7 on p. 14 and the discussion on pp. 93-94)

15. (3/9) 1.8 # 14-15 (prove or disprove)