

Due: Tuesday February 14, 2005

Question #1. Section 1.5, Exercise 11, parts a-d (page 74).

Question #2. Section 1.5, Exercise 20, parts a-c (page 75).

Question #3. [From Averbach & Chein 1980]

Andrew, Bob, Camille and Donna spent all their money at a vending machine. One kid spent a dime on candy; another spent a quarter to buy a ball; a third bought a frisbee for 35 cents; and the fourth spent 40 cents on a yo-yo. Each kid used exact change. After their purchases, the kids made the following true statements.

Andrew:

- If I had a quarter, then so did Bob.
- Bob had a nickel if and only if Camille did.
- If I had a dime, then so did Donna.

Bob:

- If I had a quarter, then so did Andrew.
- If I had a nickel, then so did Donna.

Camille:

- If I had a dime, then so did Andrew.
- If Andrew did not have a quarter, then neither did I.

Donna:

- If I had a quarter, then so did Camille.
- Bob had a dime.
- None of us had any pennies.

Question: What did each kid buy? Show your reasoning.

Notes: Use the notation A_n , A_d , A_q , ... for “Andrew had a nickel,” “Andrew had a dime,” “Andrew had a quarter,” ... Similarly, use B_c , B_b , B_f , B_y , ... for “Bob bought candy,” “Bob bought a ball,” “Bob bought a frisbee,” “Bob bought a yo-yo,” ... Also, having a quarter and having 25 cents is not the same thing. For example, Bob could not have purchased the ball, since Bob had a dime, the ball was purchased with a quarter and the kids spent all their money.

Hint: Use lots of cases.