

Due: In class today

For each of the problems below, write **three** sentences that identify a specific items of logical or mathematical reasoning that was used in the solution to the problem.

- (1) A magician has three coins in her pocket. One is a standard coin, one is a double-headed coin, and one is a double-tailed coin. She reaches into her pocket, pulls out a coin and flips it. It shows tails. What are the chances that it is the double-tailed coin?

**Solution:  $\frac{2}{3}$**

Item I:

Item II:

Item III:

- (2) Two computers are available to run a very complicated program. The first, Arnetik, can complete the program in 6 hours. The second, Betakin, can do it in only 4 hours. If the two computers are networked and the program is run together on the computers, how long will it take?

**Solution: 2 hours, 24 minutes.**

Item I:

Item II:

Item III:

- (3) An explorer intends to hire porters for her attempt to walk from village Alpha to village Beta, across vast desert. It is a 6-day walk, and each person can carry no more than enough food and water for 4 days in the desert. Food and water cannot be shared, but porters can pass off to other members of the expedition (which is the point of hiring porters). Porters do not need to walk the entire journey, but they must have enough food and water to get back to the village they started from

Is it possible for the expedition to succeed? If so, what is the minimum number of porters and rations needed?

**Solution: Yes, it can be done with 2 porters and 10 rations.**

Item I:

Item II:

Item III:

- (4) When a certain football team scores, its mascot fires a rifle once for each point of the team's total score at the time. For example, after two touchdowns and a field goal, the mascot will have fired her rifle  $7 + 14 + 17 = 38$  times in total. In a particular game, if all of the football team's scores are either 7 or 3 point and the mascot fires her rifle a total of 71 times, how many points did it score in that game?

**Solution: 23 or 19 points**

Item I:

Item II:

Item III: