

**BLACKSBURG MATH CIRCLE: SATURDAY, NOVEMBER 7,
2015**

WARM-UP PROBLEMS

Choose a few of these problems to work on as you get settled in today. You don't need to complete all of the problems now. Once you've thought about a problem on your own, talk to someone sitting near you about your ideas.

1. Deduce the conclusion if there is one.

- (1) All unripe fruit is unwholesome;
- (2) All these apples are wholesome;
- (3) No fruit, grown in the shade, is ripe

2. Deduce the conclusion if there is one.

- (1.) It is not the case that I will go to math circles and have a bad day.
- (2.) I went to math circles.

3. Extract a pair of premises and deduce the conclusion if there is one. If there is nothing to conclude, explain why.

"I can't stand this squeezing anymore. No crowded shops are comfortable."
"Well, who expects to be comfortable out shopping?"
"Why, I do of course! And I'm sure that there are some shops, further down the street, that are not crowded. So —"

4. Deduce the conclusion if there is one.

- (1) If too much homework is given, a class should not be taken.
- (2) Ms. Welch's class is awesome and should be taken.

5. Deduce the conclusion if there is one.
 - (1) Only in December is it both cold and wet;
 - (2) It is not December;

6. Three rooms have doors that are labelled "Unicorns", "Radioactive Dragons", and "Unicorns and Radioactive Dragons". You know that each door is incorrectly labelled. You are allowed to peek inside only one of the rooms exactly once, and then you have to make a decision. Describe a way to figure out which room is which.

7. While a red mark was placed on the forehead of each of three blindfolded women seated facing each other in a circle, they were told that the the mark might be either red or white. Upon removal of the blindfolds, each was to raise her hand if she saw at least one red mark, and then to take it down if she could logically deduce the color of her own mark. All three hands were quickly raised, but then one of them lowered her hand. How did she know?

8. Mr. Reader's five daughters each gave books for Christmas to one or more of her sisters. Each presented four books and each received four books, but no two girls allocated her books in the same way. That is, only one gave two books to one sister and two to another. Beth gave all her books to Alice; Christy gave three to Edith. Which sisters gave the four books to Deborah?