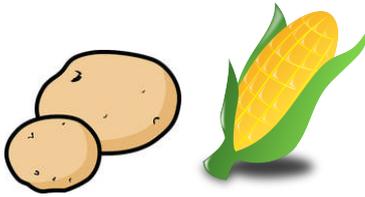


Math Circle - Homework 8

1. (10 points) Quechua is a South American language family with about 8,000,000 speakers, most of whom inhabit the Andes mountains of Peru, Bolivia and Ecuador. Quechua was the official language of the Tawantinsuyu or Inca Empire before the Spanish invasion of 1532. For hundreds of years, Cuzco — in what is now Peru — was the capital of the Inca empire. The sentences below represent the variety of Quechua currently spoken in Cuzco and in the area around Lake Titicaca.

The following are some sentences in Quechua, with their translations in mixed-up order. Indicate which translation goes with each Quechua sentence by placing the letter of the correct translation in the space provided:

- 1. Antukaq chakranpiqa t'ikashanmi papa. _____
- 2. Siskuq chakranpiqa wiashanmi sara. _____
- 3. Siskuq chakranpiqa rurushansi kiwa. _____
- 4. Antukaq chakranpiqa t'ikashanch kiwa. _____
- 5. Siskuq chakranpiqa wiashansi sara. _____
- 6. Antukaq chakranpiqa wiashanch papa. _____



- A. Potatoes may be growing in Antuka's field.
- B. Barley may be flowering in Antuka's field.
- C. Corn is growing in Sisku's field.
- D. I've heard corn is growing in Sisku's field.
- E. I've heard barley is yielding fruit in Sisku's field.
- F. Potatoes are flowering in Antuka's field.

2. (10 points) Provide English translations for the following Quechua sentences:

- 7. Istuchaq chakranpiqa t'ikashansi sara.
- 8. Sawinaq chakranpiqa wiashanch kiwa.
- 9. Tumasaq chakranpiqa rurushanmi papa.
- 10. Kusiqa chakranpiqa t'ikashanch papa.
- 11. Inashuq chakranpiqa rurushansi kiwa.

3. Someone hands you a six-sided die which you know to be slightly loaded — each face has some different probability (not necessarily equal to 1/6) of showing up on a roll. How can you get a fair 1/6 chance using only this die?