Math 465 DAY ONE EXERCISES **Winter 2017**

1. A yogurt container contains 3 red tiles and 5 yellow tiles.

   (a) Suppose that you were to randomly select one tile from the container. What do you think the probability of getting a yellow tile is?

   (b) Have someone from your group get a yogurt container, 3 red tiles and 5 yellow tiles. Without looking in the yogurt container, draw one tile 20 times over, recording the color each time. (Tally of red and tally of yellow?)

   (c) Do your results from (b) support your answer to (a)? Explain.

2. Now suppose that you were to select two tiles, one at a time, instead of just one (still from a yogurt container containing three red and five yellow tiles).

   (a) Which would you expect to be higher, the probability of selecting two yellow tiles, or selecting one yellow tile and one red tile? What is your reasoning?

   (b) What do you think the probability of drawing two yellow tiles is? What is your reasoning?

   (c) Test your hypotheses from (a) and (b) by drawing two tiles randomly twenty times and recording the results each time.

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   (b) What do you think the probability of drawing two yellow tiles is? What is your reasoning?

   (c) Test your hypotheses from (a) and (b) by drawing two tiles randomly twenty times and recording the results each time.

3. There are two methods that you could have used to select your tiles in Exercise 2:

   - **without replacement** - this means what it says, the first tile is not replaced in the yogurt container before drawing the second.
   - **with replacement** - in this case the first tile is put back in the yogurt container before drawing the second tile.

   (a) Which did you do in Exercise 2?

   (b) Do you think that the probability of selecting two yellow tiles would be higher when drawing with, or without, replacement? What is your reasoning?

   (c) Test your answer to (b) by by drawing two tiles randomly twenty times by the method you *did not* use in Exercise 2(c) and recording the results each time.

4. (a) Suppose that you were to select two tiles *with replacement* from a tub containing 50 yellow tiles and 30 red tiles. How would the probability of drawing two yellows compare to the probability when drawing from 5 yellow and 3 red? What about a tub of 500 yellow and 300 red versus 50 yellow and 30 red?

   (b) Repeat part (a) for selecting *without replacement*.

3. There are two methods that you could have used to select your tiles in Exercise 2:

   - **without replacement** - this means what it says, the first tile is not replaced in the yogurt container before drawing the second.
   - **with replacement** - in this case the first tile is put back in the yogurt container before drawing the second tile.

   (a) Which did you do in Exercise 2?

   (b) Do you think that the probability of selecting two yellow tiles would be higher when drawing with, or without, replacement? What is your reasoning?

   (c) Test your answer to (b) by by drawing two tiles randomly twenty times by the method you *did not* use in Exercise 2(c) and recording the results each time.

4. (a) Suppose that you were to select two tiles *with replacement* from a tub containing 50 yellow tiles and 30 red tiles. How would the probability of drawing two yellows compare to the probability when drawing from 5 yellow and 3 red? What about a tub of 500 yellow and 300 red versus 50 yellow and 30 red?

   (b) Repeat part (a) for selecting *without replacement*.