MTH 23.5 LECTURE NOTES (Ojakian)

Topic 9: Basic Probability

OUTLINE

References (**Algebra Book**: None; **Statistics Book**: 3.1)

1. Basic probability

1. Introducing Probability

(a) There are 7 videos. Watch videos 1 and 2 now (wait on the rest of the videos).

(b) Key points about probabiliy

i. Assigns real number between 0 and 1.

PROBLEM 1. *Convert 0 and 1 to percents.*

PROBLEM 2. *If the chance of something happening is* 25%*, write this as a decimal and as a fraction.*

ii. Sample Space (not same as "sample" from population)

PROBLEM 3. *Find the sample space in each of the following cases: 1) Flip one coin, 2) Flip two coins, 3) Flip three coins.*

iii. 3 ways to think of assigning probability (intuition, frequency, equal liklihood)

PROBLEM 4. *How would you assign probabilities in the above cases of coins? What about rolling a 6-sided die. Calculate the probabilities as percents also.*

iv. Sums to 1

v. Events

PROBLEM 5. *Section 5.1 from MY Stats Book 5th Edition (p. 165): Exercise 11.*
Also, represent it as a histogram, and the prbabilities as a relative frequency histogram

vi. Complement (two notations: "c" or over bar)

PROBLEM 6. *Section 5.1 from MY Stats Book 5th Edition (p. 165): Exercise 10*

2. Basic problems with video solutions

PROBLEM 7. *Section 5.1 from MY Stats Book 5th Edition (p. 164): Exercise 3*

PROBLEM 8. *Section 5.1 from MY Stats Book 5th Edition (p. 165): Exercise 9*

WATCH: Video 3 for solutions

3. Harder Problems with Dice

WATCH: Video 4.

(a) Example of a more complicated sample space: TWO 6-sided dice are rolled. The sample space consists of the 36 pairs of possible die rolls. Draw it!

(b)

PROBLEM 9. *Section 5.2 from MY Stats Book 5th Edition (p. 181): Exercise 9 (but NOT part a)*

PROBLEM 10. *Section 5.2 from MY Stats Book 5th Edition (p. 181): Exercise 11 (ignore question abouut being "mutually exclusive").*

WATCH: Video 5 for solutions.

4. Harder Problems with Playing Cards

WATCH: Video 6.

(a) Example of a more complicated sample space: 52 Standard Playing Cards

i. The sample space consists of the 52 playing cards, broken into categories as discussed in the video.

ii.

PROBLEM 11. *If you draw a single card from the deck, what is the probability of drawing a King?*

PROBLEM 12. *If you draw a single card from the deck, what is the probability of drawing a red Ace or a black Face Card?*

WATCH: Video 7 for solutions.