MTH 23.5 LECTURE NOTES (Ojakian)

Topic 14: Probability - Trees

OUTLINE

References (**Algebra Book**: None; **Statistics Book**: 3.5)

1. Trees

1. Trees

   (a) Example: Like 3.25 - page 191 (*BUT, do with replacement*)

   (b) Example: Now do page 191 (without replacement). See schematic on page 192.

   (c) Students: Do example 3.26 (page 192-193).

2. Tree Examples

   (a) Note: WITH and WITHOUT replacement. Reprsent the following using tree diagrams.

   PROBLEM 1. *Two cards are drawn from a regular deck of 52 cards,* **with replacement**.

   i. *What is the probability that the first card is an ace and the second is a king?*

   ii. *What is the probability the first card is NOT an ace and the second is a king?*

   PROBLEM 2. *Two cards are drawn from a regular deck of 52 cards,* **without replacement**.

   i. *What is the probability that the first card is an ace and the second is a king?*

   ii. *What is the probability the first card is NOT an ace and the second is a king? (watch out!)*

   PROBLEM 3. *A jar contains 2 red marbles, 5 blue marbles, and 5 yellow marbles.*

   i. *Suppose you take 2 marbles, without replacement. What is the probability that you take 1 blue and 1 yellow, in any order.*

   ii. *Suppose you take 2 marbles, with replacement. What is the probability that you take 1 blue and 1 yellow, in any order.*

   iii. *Suppose you take 3 marbles, without replacement. What is the probability that all are red?*

   iv. *Suppose you take 3 marbles, without replacement. What is the probability that at least one is not red?*