

## CAP4630: Stochastic Methods Practice Problems

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1. How many ways can a committee of three faculty members and two students be selected from a group of five faculty and seven students?
2. Two dice are tossed. Find the probability that their sum is:
  - a. 4
  - b. 7 or an even number
  - c. 10 or greater
3. Suppose that we are playing a game where we toss a die and then receive the amount of dollars equal to the value of the die. For example, if a 3 comes up we receive \$3. If it costs us \$4 to play this game, is this reasonable?
4. In manufacturing a product, 85% of the products that are produced are not defective. Of the products inspected, 10% of the good ones are seen as defective and not shipped whereas only 5% of the defective products are approved and shipped. If a product is shipped, what is the probability that it is defective?
5. A blood test is 90% effective in detecting a disease. It also falsely diagnoses that a healthy person has the disease 3% of the time. If 10% of those tested have the disease, what is the probability that a person who tests positive will actually have the disease?
6. Suppose an automobile insurance company classifies a driver as good, average, or bad. Of all their insured drivers, 25% are classified good, 50% are average, and 25% are bad. Suppose for the coming year, a good driver has a 5% chance of having an accident, an average driver has 15% chance of having an accident, and a bad driver has a 25% chance. If you had an accident in the past year what is the probability that you are a good driver?