Math 3043	Applied Statistics
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Practice Probability Problems March 19, 2009

(More practice problems on the way.)

**Problem 1.** You have an urn with 5 red balls, 4 blue balls, and 1 yellow ball. You pick a ball, note its color, replace it, and continue this until you have picked three balls.

- (a) Find the probability of having selected three yellow balls.
- (b) Find the probability of having selected only blue or yellow balls.
- (c) Find the probability of having selected three different colors.

(Use the tree diagram technique).

**Problem 2.** You have an urn with 5 red balls, 4 blue balls, and 1 yellow ball. You pick a ball, note its color, do not replace it, and continue this until you have picked three balls.

- (a) Find the probability of having selected three yellow balls.
- (b) Find the probability of having selected only blue or yellow balls.
- (c) Find the probability of having selected three different colors.

(Use the tree diagram technique).

**Problem 3.** You have an urn with 5 red balls, 4 blue balls, and 1 yellow ball. You pick a ball, note its color, replace it, and continue this until you have picked ten balls.

- (a) Find the probability of having selected three yellow balls.
- (b) Find the probability of having selected at least three blue balls.
- (c) Find the probability of having selected no red balls.

(Use the binomial distribution).

**Problem 4.** You have an urn with 5 red balls, 4 blue balls, and 1 yellow ball. You pick a ball, replace it, and continue this until you have picked the yellow ball; you note how many balls you picked.

- (a) Find the probability of having picked exactly five balls.
- (b) Find the probability of having picked more than five balls.

(Use the geometric distribution).

**Problem 5.** Every day you pick balls from an urn and typically get about 7 yellow balls per hour. Suppose you pick balls for 10 minutes.

- (a) Find the probability of picking exactly 3 yellow balls.
- (b) Find the probability of picking more than 3 yellow balls.
- (Use the Poisson distribution).