

Problem Set 3 for Math 17

Date Due: February 18, 2011

January 21, 2011

Problems:

Chapter 14 - 2bc, 26, 28

Chapter 15 - 6, 12acd, 46 (you may use a tree diagram or hypothetical 10000 (note you need 10000 here to prevent "half" people))

Chapter 16 - 10, 20, 30ac

Additional Questions -

1. Consider the following information about two different nicotine patches designed to help smokers quit smoking.

Overall	Patch A	Patch B
Failed	68	20
Quit	2032	780

- What is the overall probability of quitting smoking?
- Given each patch, what is the probability of quitting using each?
- Are quitting and patch choice independent? Explain.

Now consider the following additional information on smoker addiction. The top table is for occasional smokers and the bottom one is for hardcore smokers.

Occasional	Patch A	Patch B
Failed	6	10
Quit	594	590

Hardcore	Patch A	Patch B
Failed	62	10
Quit	1438	190

- What is $P(\text{quit} \mid \text{hardcore and Patch A})$? What is $P(\text{quit} \mid \text{hardcore and Patch B})$?
- What are $P(\text{quit} \mid \text{occasional and Patch A})$ and $P(\text{quit} \mid \text{occasional and Patch B})$?
- Which patch would you pick if you were trying to quit smoking? Does it matter if you are a hardcore or occasional smoker? Why?
- What is this problem an example of?

2. A researcher uses capture-recapture sampling to try to estimate the population size of salamanders at Amherst ponds. 48 salamanders were marked and during the recapture stage, 136 salamanders are collected and 13 of those are marked. Estimate the population size.