

# Stat 450

## Chapter 3 homework

Fall 2016

Turn in the following problems from WMS7 at the beginning of class on **Friday, Sept 16**:

- 3.2
- 3.12, 3.13, 3.21, 3.29, 3.33
- 3.55, 3.61
- 3.70, 3.71, 3.85
- 3.90
- 3.118
- 3.123, 3.128, 3.129, 3.130, 3.138
- 3.153, 3.156, 3.158
- 3.188, 3.202 (b then a; see below), 3.203, 3.215

Miscellaneous hints/points of clarification:

3.29: there is a typo in my textbook. It should read: “Show that  $E(Y) = \sum_{k=1}^{\infty} P(Y \geq k)$ .”

3.118: start by writing out a conditional probability and reasoning from there.

3.202: Start with part b) by deriving the distribution of  $W$ . Note that if  $Y$  is the number of cars driving past in a one-minute interval, and  $W$  the number of those cars that would decide to park, then  $(W|Y = y) \sim \text{BIN}(y, p)$ . Write out  $P(W = w|Y = y)P(Y = y)$  and apply the law of total probability to derive  $P(W = w)$ . Then use the distribution of  $W$  to answer part a).

2.215: I believe the problem could be more clearly worded. Note that it is referring to  $N$  people needing to be tested. Either they will all be tested individually (option 1), or they will be broken up into  $n$  groups of equal size  $k$ . Option 2 will then be applied to each of the  $n$  groups of size  $k$ . We want to know how many tests this will save above testing  $nk$  people individually.