

STAT 221 Introduction to Probability and Statistics Winter 2012

Quiz 12

Taken on Thur Feb 2. You may work with a group of as many as 4 students, submitting one quiz with all names, provided that you all contribute to the work. You may use your notes. Also, please include your section number (8am: section 2, 9am: section 3) and “quiz 12” along with your name.

Suppose that you encounter two traffic lights on your commute to school. Based on past experience, you judge that the probability is .5 that the first light will be red when you get to it, .4 that the second light will be red, and .3 that both lights will be red.

Let R_1 denote the event that the first light is red, and let R_2 denote the event that the second light is red.

- 1) Determine the probability that *at least one* light will be red. (Show how you calculate this.)
- 2) Determine the conditional probability that the second light will be red given that the first light is red. (Show how you calculate this.)
- 3) Are the events R_1 and R_2 independent? Justify your answer numerically.
- 4) Are the events R_1 and R_2 disjoint (mutually exclusive)? Justify your answer numerically.
- 5) Determine the conditional probability that the second light will *not* be red, given that the first light is *not* red. (Show how you calculate this.)