

## Solutions to the actual Math 477 “QUIZ” for Lecture 6

**Note:** Being an absent-minded professor, I forgot the original quizzes at home. You should still do them for practice, and having done them, check your solution with the posted solution. Below is the answer to the ad-hoc quiz I made up on the board for Lecture 6.

1. The number of injury claims per month is modeled by a random variable  $N$  with

$$P\{N = n\} = \frac{1}{(n+1)(n+2)}, \quad \text{where } n \geq 0 \quad .$$

Determine the probability of at least one claim during a particular month, given that there have been at most two claims during that month.

**Sol. to 1.:**

$$\begin{aligned} P\{N \geq 1 | N \leq 2\} &= \frac{P\{1 \leq N \leq 2\}}{P\{N \leq 2\}} = \\ &= \frac{P\{N = 1\} + P\{N = 2\}}{P\{N = 0\} + P\{N = 1\} + P\{N = 2\}} \\ &= \frac{1/6 + 1/12}{1/2 + 1/6 + 1/12} = \frac{1}{3} \quad . \end{aligned}$$

**Ans. to 1.:** the probability of at least one claim during a particular month, given that there have been at most two claims during that month is  $\frac{1}{3}$ .