

Math 431, Assignment #4

(due 3/8/01)

This assignment covers sections 4.1, 4.3, 4.4, and 4.5. Most of the problems come from pages 173-184 of Ross.

Remember, as on the previous assignments, to indicate how many hours you spent on the assignment, and whom you worked with. Also remember to show your work if you want to receive credit.

1. Problems 7 and 8. Also, in each of the four cases ((a), (b), (c), and (d)), compute the expected value of the random variable.
2. Problem 20.
3. Problem 23.
4. Problem 28.
5. Problem 32. Express your answer to three significant figures.
6. Problem 77.
7. Define the “mean error” of a random variable X as the expected value of the random variable $|X - c|$, where c denotes the expected value of X . Thus, for instance, if X is the outcome of a roll of an ordinary fair die, the expected value of X is $c = 3.5$ and the mean error of X is $\sum_{i=1}^6 (1/6)|i - 3.5| = 1.5$. Suppose I roll three six-sided dice, where the first die has two faces marked “1” and four faces marked “4”, the second die is marked like the first one, and the third die has four faces marked “2” and two faces marked “5”. Assume the rolls of the three dice are independent, and let X , Y , and Z denote the numbers shown by the respective dice. Compute the expected value and mean error of each of the following random variables: X , Y , Z , $X + Y$, $X + Z$.

Each problem is worth 14 points. Additionally, you can get up to 5 bonus points for making a good estimate of your raw score (which will lie between 0 and 98).