

Math 262 Reading Guide

Sections 4.3.1–4.3.2

NAME

Read Sections 4.3.1 and 4.3.2, and answer the following questions. *Hand in this worksheet at the next class.*

1. Let X and Y be independent continuous random variables with marginal pdfs $f_X(x)$ and $f_Y(y)$, respectively. Write an integral that gives the pdf of $W = X + Y$. What is this integral operation called?

2. How is the Theorem at the beginning of the section applied in Example 4.21?

3. Let X_1, X_2, \dots, X_n be independent random variables and let $Y = a_1X_1 + a_2X_2 + \dots + a_nX_n + b$. How does the moment generating function of Y relate to the moment generating functions of the X_i ?

4. What is the distribution of $X_1 + X_2 + \dots + X_n$ in each of the following cases?
 - (a) X_1, X_2, \dots, X_n are independent normally distributed random variables.

 - (b) X_1, X_2, \dots, X_n are independent Poisson random variables.

 - (c) X_1, X_2, \dots, X_n are independent exponential random variables with common parameter λ .