

Homework 8

MTH 3210 Probability and Statistics

Due Thu., Apr. 25 (but can also be handed in Tue., May 2)

Unless stated otherwise, you must **show your work** to receive full credit.

Read These Sections of the Book	Then Do These Problems
5.5	67*
7.1	2, 4
7.2	13, 20, 23
7.3	32, 33

* **Hint:** For Problem 67, let

X_1 = The length of the first piece of PVC pipe

X_2 = The length of the second piece of PVC pipe

X_3 = The length of the overlap when the two pieces of pipe are fitted together

Then X_1 , X_2 , and X_3 are **independent**, with

$$X_1 \sim N(20, 0.5) \quad X_2 \sim N(15, 0.4) \quad X_3 \sim N(1, 0.1)$$

The total length after insertion,

$$Y = X_1 + X_2 - X_3,$$

is a $\mathbf{N}(\mu_Y, \sigma_Y)$ random variable. What are the values of $\mu_Y = E(Y)$ and $\sigma_Y = SD(Y)$?