

## Exercises 7

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The below are in-class exercises designed to help solidify your understanding of the material covered in the notes. They will also aid you in completing some homework problems. Please work together with your group to complete as many of these problems as you can.

PN refers to the online textbook by Pishro-Nik available here. Please do not look at the solutions until after you have completed the problem or received hints from me.

**Exercise 1**

PN 4.4.0, problem 13

**Exercise 2**

PN 4.4.0, problem 14(a)

**Exercise 3**

PN 4.4.0, problem 17(b)

**Exercise 4**

PN 4.4.0, problem 20(c)

**Exercise 5**

Let  $X \sim \text{Unif}([-4, 4])$  and  $Y = g(X)$ , where

$$g(x) = \begin{cases} 1, & -2 \leq x < -1 \\ x^2, & -1 \leq x < 0 \\ x, & 0 \leq x < 2 \\ 2, & 2 \leq x < 3 \\ 0, & 3 \leq x < 4 \end{cases}.$$

Find  $F_Y(y)$  and  $f_Y(y)$  (the CDF and PDF of  $Y$ ).

**Exercise 6**

Use the method described in Sec. 3.1 of the lecture notes to generate  $Y \sim \exp(\lambda)$  from  $X \sim \text{Unif}([0, 1])$ .