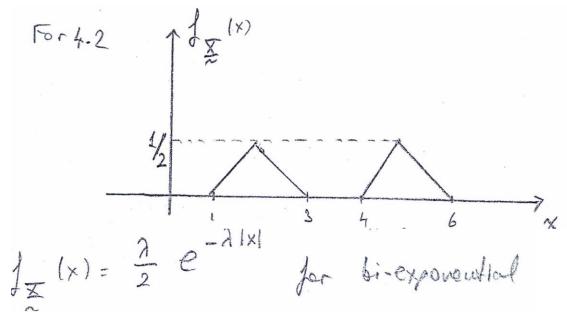
MATH 255 Homework 4

(Due 27 November 2023)

- 1. Go to www.random.org.
- 2. Generate true random numbers uniformly distributed in the interval [0,1].
- 3. Input 2000 of these numbers to your computer; print first 50 of them
- 4. Write a computer program to convert these uniformly distributed random numbers to a random numbers from the following probability densitiy functions; provide the analytic procedure for the conversion.
 - 4.1. Exponentially distributed with λ =2; store all 2000 numbers in a file; print first 50 of them.
 - 4.2. The pdf is as given in the Figure below; 2000 numbers in a file; print first 50 of them.
 - 4.3. Two-sided exponentially distributed with $\lambda=2$ (the pdf for this distribution is given below); print first 50 of them.
- 5. Make histograms of 2000 random numbers in 3, 4.1, 4.2 and 4.3. Use 20 slots; do they look like "uniform", "exponential" and "triangular" distributed random numbers.
- 6. Estimate the mean and variance of the random numbers in 3, 4.1, 4.2 and 4.3. (This is a numerical estimation from the 2000 long numerical arrays. You may use any procedure, including any available facility in your programming environment; but you must indicate the exact formula that is used.)



(© Levent Onural, 2023. Prepared only for the students registered to MATH255 course in 2023-2024 Fall semester. Not to be distributed to others by any other means.)