Homework 7
MTH 3210 Probability and Statistics
Due Thu., Apr. 18

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

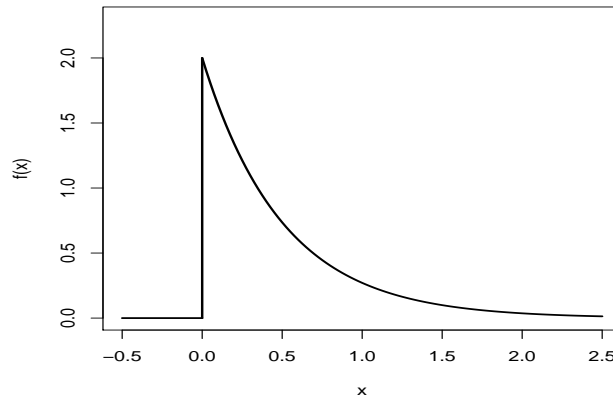| Read These Sections of the Book	Then Do These Problems
4.4	Problem 1 (below), 59, 61
5.1 (**Optional**)	
5.2 (**Optional**)	
5.3	Just read this section
5.4	46, 47, 50, 51

1. Let

   X = The time between two successive arrivals at the drive-up window of a local bank.

   Suppose X has the **pdf** (an ***exponential distribution***)

   $$f(x) = \begin{cases} 2e^{-2x} & \text{for } x \geq 0 \\ 0 & \text{otherwise} \end{cases}$$

   A graph of the pdf is below.

   Compute the following.

   (a) $P(X \leq 4)$.

   (b) $P(2 \leq X \leq 5)$.

   (c) The **expected value** of the time between two successive arrivals. **Hint**: The integral $\int 2xe^{-2x}\, dx$ can be evaluated using *integration by parts*.