

1016-345-01

# Probability and Statistics for Engineers

In-class exercise

2011 January 4

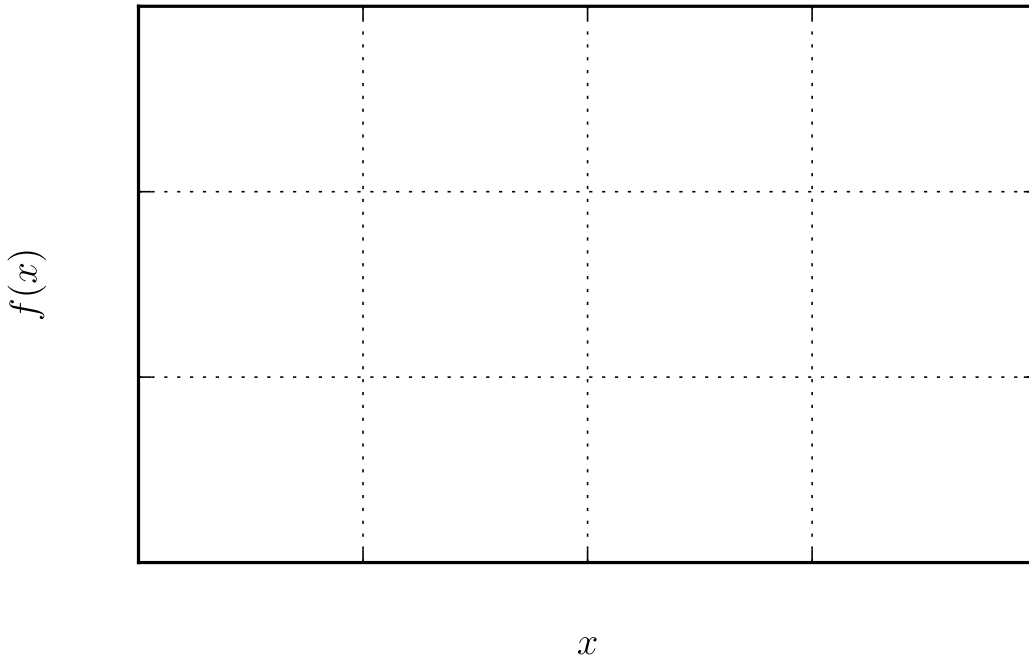
Consider a continuous random variable with the uniform probability density function

$$f(x) = \begin{cases} \frac{1}{B-A} & A < x < B \\ 0 & \text{otherwise} \end{cases}$$

a. Verify that  $f(x)$  is normalized, i.e., that

$$\int_{-\infty}^{\infty} f(x) dx = 1$$

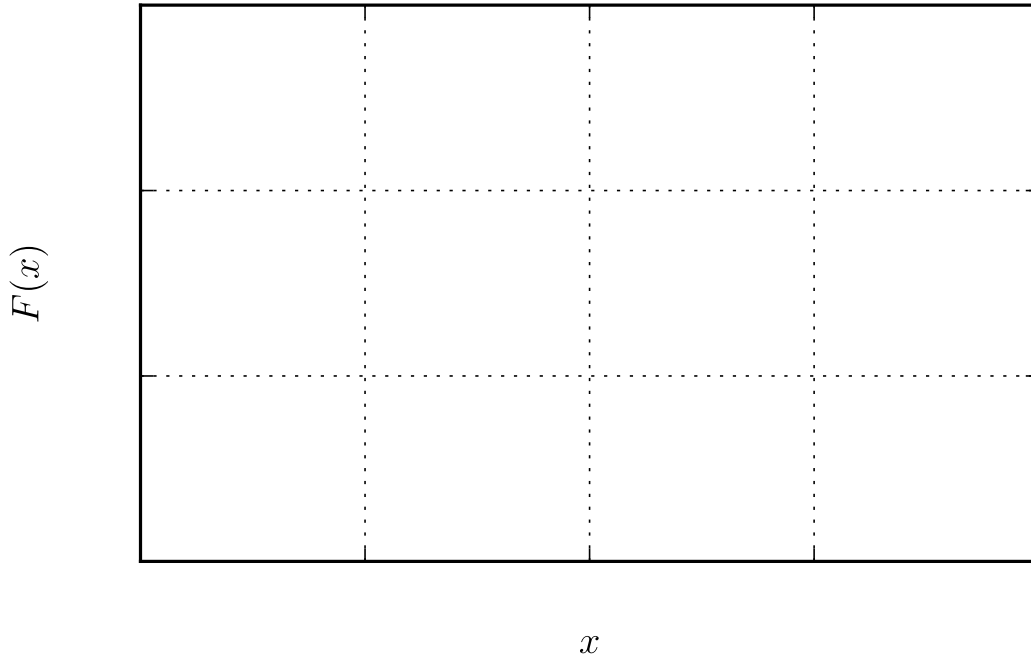
b. Sketch the graph of  $f(x)$ . Label the axes.



Consider a continuous random variable with the uniform probability density function

$$f(x) = \begin{cases} \frac{1}{B-A} & A < x < B \\ 0 & \text{otherwise} \end{cases}$$

- c. Find the cumulative distribution  $F(x)$ .
- d. Sketch the graph of  $F(x)$ . Label the axes.



- e. Calculate the expected value  $E(X)$  in terms of  $A$  and  $B$ .
- f. Calculate the variance  $V(X)$  in terms of  $A$  and  $B$ .