ISyE 2027, Homework 4
Due June 10, Wednesday

1. Suppose X has the probability density function

$$\begin{aligned} f(x) &= \frac{x}{2} \; 0 < x < 2 \\ f(x) &= 0 \text{ otherwise} \end{aligned}$$

(a) Compute the corresponding cumulative distribution function
(b) Compute $P\{X > \frac{3}{2}\}$

2. A student is taking a multiple-choice test in which each question has four possible answers. There are 10 questions in the test. She knows the answers to 5 of the questions, can narrow the choices to 2 in 3 questions and knows nothing about 2 of the questions. What is the probability that she will correctly answer
(a) 10 questions
(b) 9 questions
(c) 6 questions

3. Suppose X is an exponential random variable with parameter λ. Compute $P\{X > 2/\lambda\}$.

4. Define $F(x) = 3x^2 - 2x^3$ for $0 < x < 1$ with $F(x) = 0$ if $x \leq 0$ and $F(x) = 1$ if $x \geq 1$. Find the corresponding density function.