Problem 8.21 Consider a random variable *X* that is uniformly distributed between the values of 0 and 1 with probability $\frac{1}{4}$ takes on the value 1 with probability $\frac{1}{4}$ and is uniformly distributed between values 1 and 2 with probability $\frac{1}{2}$. Determine the distribution function of the random variable *X*.

Solution

$$F_{x}(x) = \begin{cases} 0 & x \le 0 \\ \frac{x}{4} & 0 < x < 1 \\ \frac{1}{2} & x = 1 \\ \frac{1}{2} + \frac{1}{2}(x-1) & 1 < x \le 2 \\ 1 & x > 2 \end{cases}$$

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