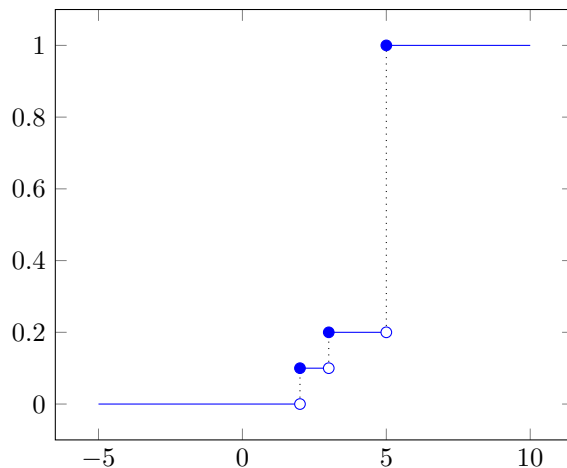1. Show that
$$P(X = x) = F(x^+) - F(x^-).$$

2. Let X be such that $P(X = 2) = P(X = 3) = 1/10$ and $P(X = 5) = 8/10$.
   Plot the CDF F. Use F to find $P(2 < X \le 4.8)$ and $P(2 \le X \le 4.8)$.

x	P(X=x)	$F_X(x)$
2	1/10	1/10
3	1/10	2/10
5	8/10	10/10

   $$
   \begin{aligned}
   P(2 < X \le 4.8) &= P(X > 2) \cdot P(X \le 4.8) \\
   &= \{1 - P(X \le 2)\} \cdot P(X \le 4.8) \\
   &= \{1 - F_X(2)\} \cdot F_X(4.8) \\
   &= \{1 - 1/10\} \cdot 2/10 \\
   &= 18/100
   \end{aligned}
   $$

   $$
   \begin{aligned}
   P(2 \le X \le 4.8) &= P(X \ge 2) \cdot P(X \le 4.8) \\
   &= \{P(X > 2) + P(X = 2)\} \cdot P(X \le 4.8) \\
   &= \{1 - P(X \le 2) + P(X = 2)\} \cdot P(X \le 4.8) \\
   &= \{1 - F_X(2) + P(X = 2)\} \cdot F_X(4.8) \\
   &= \{1 - 1/10 + 1/10\} \cdot 2/10 \\
   &= 2/10
   \end{aligned}
   $$

   $\mathbb{P}$

3. Prove Lemma 2.15.