

Example:

Suppose we toss 3 fair coins. If Y is the random variable denote the number of heads that appear.

$$\Omega = \{ HHH, HHT, HTH, TTH, THT, HTT, TTT \}$$

$$TTT$$

$$\#\Omega = 8$$

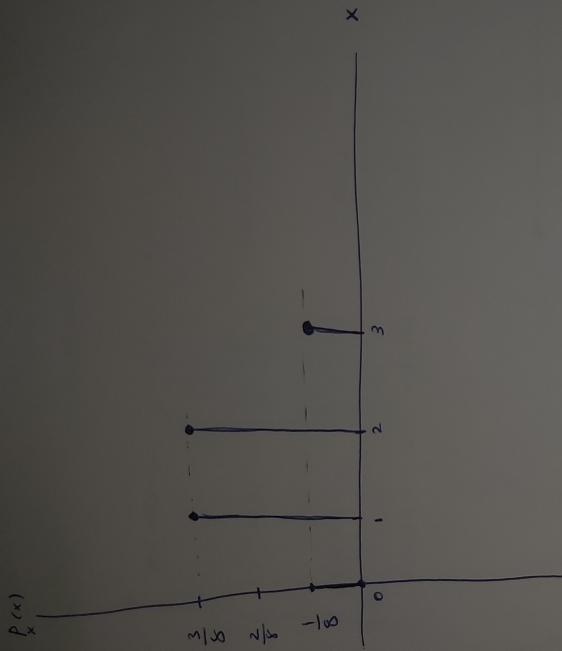
$$R_X = \{0, 1, 2, 3\}$$

$$P_X^{(0)} = P(Y=0) = P(TTT) = \frac{1}{8}$$

$$P_X^{(1)} = P(Y=1) = P\{ TTH, THT, HTT \} = \frac{3}{8}$$

$$P_X^{(2)} = P(Y=2) = P\{ THH, HTH, HHT \} = \frac{3}{8}$$

$$P_X^{(3)} = P(Y=3) = P\{ HHH \} = \frac{1}{8}$$



$$F_X(x) = \sum_{x_k \leq x} p_X(x_k)$$

$$F_X(0) = \sum_{x_k \leq 0} p_X(x_k) = p_X(0) = \frac{1}{8}$$

$$F_X(1) = \sum_{x_k \leq 1} p_X(x_k) = p_X(0) + p_X(1) = \frac{1}{2}$$

$$F_X(2) = \sum_{x_k \leq 2} p_X(x_k) = p_X(0) + p_X(1) + p_X(2) = \frac{1}{8} + \frac{3}{8} + \frac{3}{8} = \frac{7}{8}$$

$$F_X(3) = \sum_{x_k \leq 3} p_X(x_k) = p_X(0) + p_X(1) + p_X(2) + p_X(3) = \frac{1}{8} + \frac{3}{8} + \frac{3}{8} + \frac{1}{8} = 1$$