Q2) a -

$$D(i,j) = \begin{cases} (i+1, j+1) & \text{if } x \le 0.25 \quad (\text{Case 1}) \\ i - 0.25 & \text{if } 0.25 < x \le 0.5 \quad (\text{Case 2}) \\ j - 0.25 & \text{if } 0.5 < x \le 0.75 \quad (\text{Case 3}) \\ (i+0.5, j+0.5) & \text{if } 0.75 < x \le 1 \quad (\text{Case 4}) \end{cases}$$

Starts at (0,0) and end at (2,2)

Consider first 4 moves, ways of winning are as follows,

(i) C1, C1 → destination
(ii) C4, C4, C4, C4 → dest^n
(iii) C4, C1, C4 → dest^n {3 permutations possible}

If we take only first 4 moves, there are the only ways to reach to dest^n!

Whereas, total no. of possibilities are,

$$4 \times 4 \times 4 \times 4$$

$$\therefore P(\text{dest}^n) = \frac{5}{4^4}$$