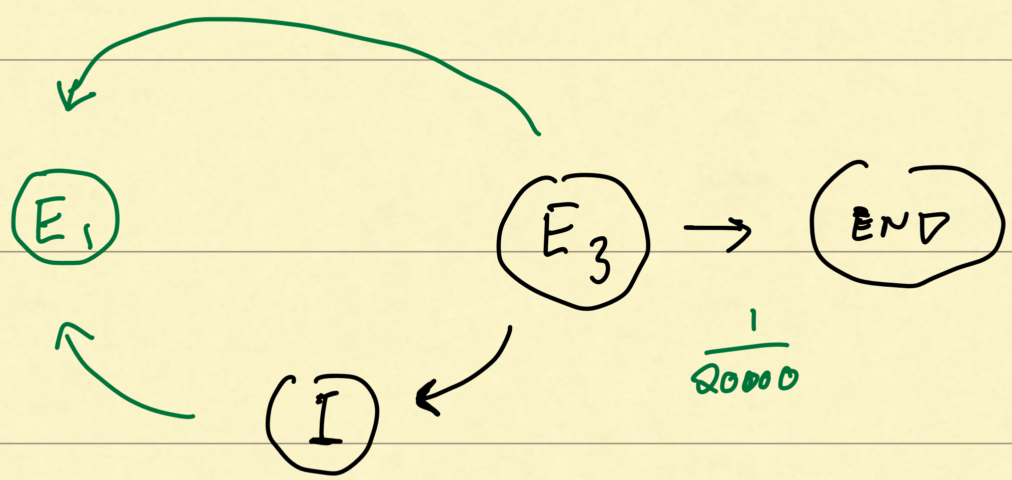
$$
\begin{array}{c|cccccc}
 & \text{START} & E_1 & E_2 & E_3 & I & \text{END} \\
\hline
\text{START} & 0 & 0 & 0 & 0 & 0 & 0 \\
E_1 & 1 & 0 & 0 & \frac{19989}{20000} & \frac{1}{6000} & 0 \\
E_2 & 0 & 1 & 0 & 0 & 0 & 0 \\
E_3 & 0 & 0 & 1 & 0 & 0 & 0 \\
I & 0 & 0 & 0 & \boxed{\frac{10}{20000}} & \frac{5999}{6000} & 0 \\
\text{END} & 0 & 0 & 0 & \frac{1}{20000} & 0 & \text{ANY}
\end{array}
$$

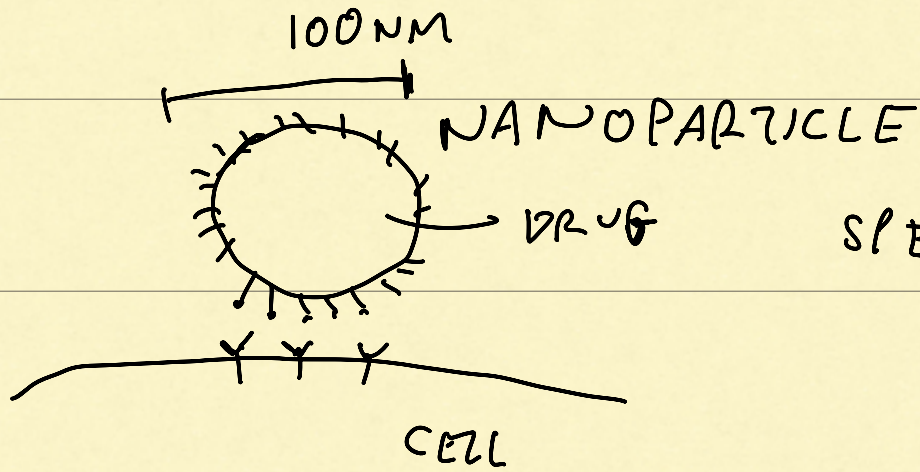


$P_{E3 \to END} =$

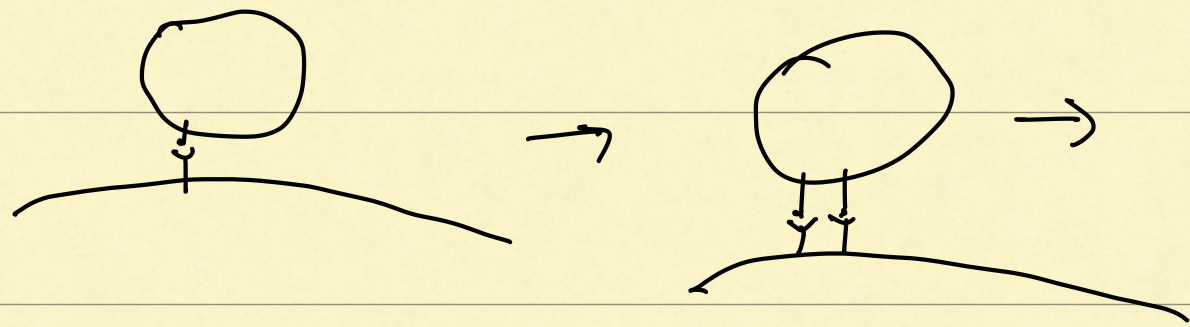
$P_{E3 \to I} =$

MEAN FIRST PASSAGE TIME

EX



SPECIFICITY

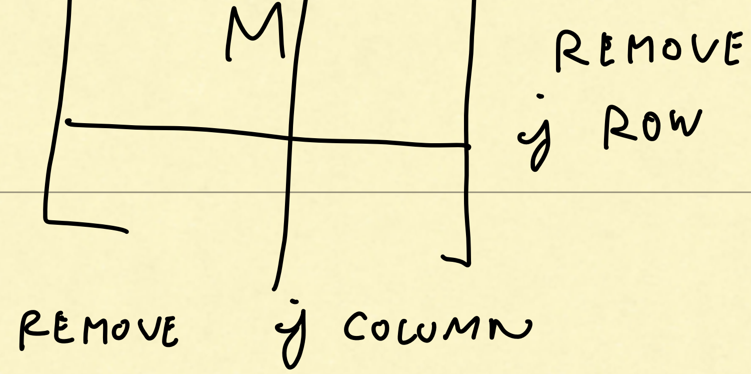


$$2 \to 3 \to 4 \to 3 \to 4 \to 5 \to 4 \to 3 \to 2 \to 3$$
$$\to 2 \to 1 \to 0$$

WHAT IS THE MEAN TIME TO FIRST PASS FROM STATE k TO STATE j?

$\underline{M}$ - TRANSITION MATRIX

DEFINE $\underline{M}_{-j} =$



T_{kj} - MEAN FIRST PASSAGE TIME FROM k TO j

$$\vec{T}_j = \begin{bmatrix} T_{1j} \\ \vdots \\ T_{Nj} \end{bmatrix} \qquad \text{(NO } j^{\text{TH}} \text{ ENTRY)}$$

N - TOTAL NUMBER OF STATES

THEN

$$\underset{(N-1)\times 1}{\begin{bmatrix} -1 \\ -1 \\ -1 \\ -1 \\ \vdots \\ -1 \end{bmatrix}} = \Big(\underset{(N-1)\times(N-1)}{M_{-j}} - \underset{(N-1)\times(N-1)}{\overset{\text{IDENTITY}}{I}} \Big) \cdot \overset{(N+1)\times 1}{\vec{T}_j}$$

SOLVE FOR $\vec{T}_j$