

Solve the following mathematical problems.

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Obtain:

$$\int e^x \cos(x)$$

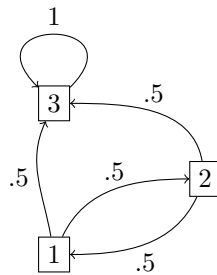
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Obtain:

$$\lim_{x \rightarrow 1} \frac{x^4 - 1}{x^2 - 1}$$

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What is the long run stationary distribution of the following discrete time Markov chain:



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Minimize:  $4x + 12y$   
subject to:

$$\begin{aligned} x &\geq 0 \\ y &\geq 0 \\ 5x - y &\geq 2 \\ x + 2y &\leq 1 \end{aligned}$$

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Obtain the mixed Nash equilibria for the following game:

$$\begin{pmatrix} 5, 6 & 1, 0 \\ 0, 1 & 6, 5 \end{pmatrix}$$