

Solve the following mathematical problems.

Obtain:

Answer: $\frac{e^x}{2} \sin(x) + \frac{e^x}{2} \cos(x)$

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

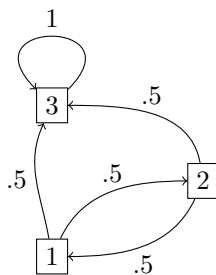
Obtain:

Answer: 2

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

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

Answer: $(0, 0, 1)$



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

Answer: $(x, y) = (\frac{2}{5}, 0)$

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