2010 Q11

11. Obtain the general solution of the equation

\[
\frac{d^2y}{dx^2} + 4 \frac{dy}{dx} + 5y = 0.
\]

Hence obtain the solution for which \( y = 3 \) when \( x = 0 \) and \( y = e^{-\pi} \) when \( x = \frac{\pi}{2} \).

Answer

*Particular Solution: \( y = e^{-2x}(3\cos x + \sin x) \)*