

QUESTION

Find the complementary function ONLY of $\frac{d^2x}{dt^2} - 5\frac{dx}{dt} + 4x = e^t$.

ANSWER

To find the complementary function we need to solve $\frac{d^2x}{dt^2} - 5\frac{dx}{dt} + 4x = 0$

The auxiliary equation is $m^2 - 5m + 4 = (m - 4)(m - 1) = 0$ so $m = 1, 4$

The complementary function is $x = Ae^t + Be^{4t}$