

20. a) Solve the simultaneous equation using Laplace transform $\frac{dx}{dt} = x - 2y$ and $\frac{dy}{dt} = x - y$ given that

$$x(0) = 1 \text{ and } y(0) = 1$$

(Or)

b) Find the Fourier transform of $f(x) = \begin{cases} x, & |x| < a \\ 0, & |x| > a \end{cases}$

21. a) Use Parseval's identity to evaluate $\int_0^\infty \frac{dx}{x^2+a^2}$ and $\int_0^\infty \frac{x^2}{x^2+a^2} dx$ [use $f(x) = e^{-ax}$ then $F_C(s) = \frac{a}{a^2+s^2}$]

(Or)

b) Find the Inverse Laplace transform of $\frac{s^2}{(s^2+4)(s^2+9)}$

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