

[1] Find the series solution of the equation $x^2 y'' - xy' + (1+x)y = 0$

[2] Compute the integrals: (a) $\int_0^{\infty} \frac{e^{-2x}}{x\sqrt{x}} dx$ (b) $\int_{-\infty}^{\infty} \frac{x^2}{1+x^4} dx$ (c) $\int_0^{\infty} \frac{2^x - 3^x}{x} dx$

[3] Find F(s) to the functions: (a) $f(t) = (t-2\sin t)^2$ (b) $f(t) = (t-2)\sin(t-2)$, $t > 2$

[4] Define the Dirac function $\delta_0(t)$ and show that $L\{\delta_0(t)\} = 1$

[5] Using L.T solve the equation: $y'' - 4y' + 4y = [t e^t]^2$, $y(0) = y'(0) = 0$

Good Luck

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