

[1] Solve the following equations by power series:

(a) $y'' + xy = 0$

(b) $x^2 y'' - xy' + (x + 1)y = 0$

[2] Find the following integrals:

(a) $\int_0^\infty \sqrt{x} e^{-2x} dx$

(b) $\int_0^\infty \frac{1}{1+x^3} dx$

(c) $\int_0^2 \frac{x^2}{\sqrt{2-x}} dx$

[3] Find the Laplace transform of the following functions:

(a) $f(t) = t^2 + \sin 3t + 5$

(b) $f(t) = t \sin t + e^{2t} \cos t$

(c) $f(t) = \sqrt{t-2} + \sin(t-2), \quad t > 2.$

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Good Luck

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