

Part I Problems

Problem 1: Let z be a given complex number. From the definition of the Laplace transform, find $\mathcal{L}(e^{-zt})$ and also its region of convergence.

Problem 2: By using the table of formulas, find:

$$(a) \mathcal{L}(e^{-t} \sin 3t) \quad (b) \mathcal{L}(e^{2t}(t^2 - 3t + 2)).$$

Problem 3: Find $\mathcal{L}(e^{-t} \sin 3t)$ by writing $e^{-t} \sin 3t$ as a linear combination of complex exponentials. Compare the answer to that obtained in the previous problem.

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