Part I Problems

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

Problem 2:   By using the table of formulas, find:
$$\text{(a) } \mathcal{L}\left(e^{-t}\sin 3t\right) \qquad \text{(b) } \mathcal{L}\left(e^{2t}(t^2 - 3t + 2)\right).$$

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

18.03SC Differential Equations
Fall 2011