Laplace properties

Property 1: The ROC of X(s) consists of strips parallel to the jω-axis in the s-plane.

Property 2: For rational Laplace transforms, the ROC does not contain any poles

Property 1: If x(t) is of finite duration and is absolutely integrable, then the ROC is the entire s-plane.

Property 4: If x(t) is right-sided, and if the line $\text{Re}\{s\} = \sigma_0$ is the ROC, then all values of s for which $\text{Re}\{s\} > \sigma_0$ will be in the ROC.

Property 5: If x(t) is left-sided, and if the line $\text{Re}\{s\} = \sigma_0$ is the ROC, then all values of s for which $\text{Re}\{s\} < \sigma_0$ will be in the ROC.

Property 6: If x(t) is two-sided, and if the line $\text{Re}\{s\} = \sigma_0$ is the ROC, then the ROC will consist of strip in the s-plan that includes the line $\text{Re}\{s\} = \sigma_0$.

Property 7: If the Laplace transform X(s) of x(t) is rational, then its ROC is bounded by poles or extends to infinite. In addition, no poles of X(s) are contained in the ROC.

Property 8: If the Laplace transform X(s) of x(t) is rational, and if x(t) is rightsided, the ROC is the region in the s-plane to the right of the rightmost pole. If x(t)is left sided, the ROC is the region in the s-plane to the left of the leftmost pole.