

Problem S5.2

Find the Laplace transform of $f(t) = e^{-k t} \sin(bt)$ where k and b are constants.

Solution

Let $g(t)$ be defined as $g(t) = \sin(bt)$ then $G(s) = \frac{b}{s^2 + b^2}$

Applying the property $L\{f(t)e^{-\alpha t}\} = F(s + \alpha)$, we have $F(s) = \frac{b}{(s + k)^2 + b^2}$