CISE 302: Linear Control Systems

Inverse Laplace Transform

Problem S4.10

Obtain the inverse Laplace transform of $\frac{3}{s^2 + 4s + 3.91}$

Solution:

$$\frac{3}{s^2 + 4s + 3.91} = \frac{A}{s + 2.3} + \frac{B}{s + 1.7}$$

$$A = (s + 2.3) \frac{3}{(s + 2.3)(s + 1.7)} \Big|_{s = -2.3} = -5$$

$$B = (s + 1.7) \frac{3}{(s + 2.3)(s + 1.7)} \Big|_{s = -1.7} = 5$$

$$\frac{3}{s^2 + 4s + 3.91} = \frac{-5}{s + 2.3} + \frac{5}{s + 1.7}$$

$$f(t) = -5e^{-2.3t} + 5e^{-1.7t}$$