

Problem 4

In each of Problems 1 through 10, find the inverse Laplace transform of the given function.

$$F(s) = \frac{3s}{s^2 - s - 6}$$

Solution

Factor the denominator.

$$\begin{aligned} F(s) &= \frac{3s}{s^2 - s - 6} \\ &= \frac{3s}{(s - 3)(s + 2)} \\ &= \frac{9/5}{s - 3} + \frac{6/5}{s + 2} \end{aligned}$$

Take the inverse Laplace transform now to get $f(t)$.

$$f(t) = \frac{9}{5}e^{3t} + \frac{6}{5}e^{-2t}$$