Exercise 14

Find the inverse Laplace transform of the following:

$$F(s) = \frac{1}{s^2 - 1} + \frac{3}{s^2 + 9}$$

Solution

$$\begin{aligned}\mathcal{L}^{-1}\left\{\frac{1}{s^2 - 1} + \frac{3}{s^2 + 9}\right\} &= \mathcal{L}^{-1}\left\{\frac{1}{s^2 - 1}\right\} + \mathcal{L}^{-1}\left\{\frac{3}{s^2 + 9}\right\} \\ &= \sinh x + \sin 3x\end{aligned}$$