

Exercise 9

Prove the identity.

$$\cosh x + \sinh x = e^x$$

Solution

Use the definitions listed on page 259.

$$\begin{aligned}\cosh x + \sinh x &= \left(\frac{e^x + e^{-x}}{2} \right) + \left(\frac{e^x - e^{-x}}{2} \right) \\ &= \frac{(e^x + e^{-x}) + (e^x - e^{-x})}{2} \\ &= \frac{2e^x}{2} \\ &= e^x\end{aligned}$$