

Exercise 3

Find the numerical value of each expression.

(a) $\cosh(\ln 5)$

(b) $\cosh 5$

Solution**Part (a)**

Use the definition of hyperbolic cosine listed on page 259.

$$\cosh(\ln 5) = \frac{e^{\ln 5} + e^{-\ln 5}}{2} = \frac{e^{\ln 5} + e^{\ln 5^{-1}}}{2} = \frac{5 + 5^{-1}}{2} \times \frac{5}{5} = \frac{5^2 + 5^0}{10} = \frac{25 + 1}{10} = 2.6$$

Part (b)

Use the definition of hyperbolic cosine listed on page 259.

$$\cosh 5 = \frac{e^5 + e^{-5}}{2} \approx 74.2099$$