Exercise 288

For the following exercises, solve the logarithmic equation exactly, if possible.

$$\ln \sqrt{x+3} = 2$$

Solution

Rewrite the argument so that it has a fractional exponent.

$$\ln(x+3)^{1/2} = 2$$

Use the property of logarithms that brings the exponent down in front.

$$\frac{1}{2}\ln(x+3) = 2$$

Multiply both sides by 2.

$$\ln(x+3) = 4$$

The base is e, the exponent is 4, and the result is $x+3$.

$$e^4 = x + 3$$

Solve for x.

$$x = e^4 - 3 \approx 51.6$$