

Solution

$$\begin{aligned}\int \frac{1}{\sqrt{x^2 + 6x + 9}} dx &= \int \frac{1}{\sqrt{(x + 3)^2}} dx \\ &= \int \frac{1}{x + 3} dx \\ &= \ln |x + 3| + C\end{aligned}$$

using the substitution $u = x + 3$.