

04 - King's Rule

If we are evaluating the definite integral from a to b , it is sometimes helpful for us to do the substitution $y = a + b - x$. This substitution is

King's Rule: $\int_a^b f(x) \, dx = \int_a^b f(a + b - x) \, dx$.

Example 1

Evaluate the following integral:

$$\int_0^{\frac{\pi}{2}} \frac{\sqrt{\sin x}}{\sqrt{\sin x} + \sqrt{\cos x}} \, dx$$

Example 2 (Serret's Integral)

Evaluate the following integral (called Serret's Integral):

$$\int_0^1 \frac{\ln(x+1)}{x^2+1} \, dx$$