

Calculus I

$\int (ax + b)^p dx$, part 2

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Example (Substitution Rule)

Find $\int \sqrt{2x+1} dx$.

Let $u = 2x + 1$.

Then $du = 2dx$

$$dx = \frac{1}{2} du.$$

Substitute:
$$\begin{aligned} \int \sqrt{2x+1} dx &= \int \frac{1}{2} \sqrt{u} du \\ &= \frac{1}{2} \cdot \frac{u^{\frac{3}{2}}}{\frac{3}{2}} + C \\ &= \frac{1}{3} (2x+1)^{\frac{3}{2}} + C. \end{aligned}$$