Answer on Question #80294 – Math – Calculus

Question

$$\int \frac{1}{1+\sqrt[3]{x+1}}dx$$

Solution

$$\int \frac{1}{1+\sqrt[3]{x+1}}dx$$

Substitution

$u = \sqrt[3]{x+1} => x = u^3 - 1, dx = 3u^2 du$

$$\int \frac{1}{1+\sqrt[3]{x+1}}dx = \int \frac{3u^2}{1+u}du = \int \frac{3u^2-3+3}{1+u}du =$$

$$= 3\int \frac{(u-1)(u+1)}{1+u}du + 3\int \frac{1}{1+u}du =$$

$$= 3\int (u-1)\,du + 3\int \frac{1}{1+u}du =$$

$$= \frac{3}{2}u^2 - 3u + 3\ln|1+u| + C =$$

$$= \frac{3}{2}(x+1)^{2/3} - 3\sqrt[3]{x+1} + 3\ln|1+\sqrt[3]{x+1}| + C$$

Answer: $\int \frac{1}{1+\sqrt[3]{x+1}}dx = \frac{3}{2}(x+1)^{2/3} - 3\sqrt[3]{x+1} + 3\ln|1+\sqrt[3]{x+1}| + C$