Wednesday - January 13, 2016

(43) $\int_0^4 \frac{5}{3x+1}\,dx$

$u = 3x+1$

$du = 3\,dx$

$\frac{1}{3}\int_1^{13} \frac{5}{u}\,du = \frac{1}{3}\left[5\,Ln|u|\right]_1^{13} = \frac{1}{3}\left[5\,Ln|3x+1|\right]_0^4$

$= \frac{1}{3}\left[5Ln13 - 0\right]$ $= \frac{1}{3}\left[5Ln13 - 0\right]$

(48) $\int_0^1 \frac{x-1}{x+1}\,dx = \int \frac{u-1-1}{u}\,du$

$u = x+1$

$du = 1\,dx$

$x = u-1$

$= \int \frac{u-2}{u}\,du$

$\left[x+1 - Ln(x+1)^2 + 4\right]_0^1 = \int 1 - \frac{2}{u}\,du$

1 − 2Ln2

1 − Ln4

$\left[2 - Ln4\right] - \left[1 - 0\right] = u - 2Ln|u| + C$

$\int x^n\,dx = \frac{x^{n+1}}{n+1} + C$

$x^{-1} = \frac{1}{x}$

$n \neq -1$

$\int x^{-1}\,dx = Ln|x| + C$

(50) $\int_{.1}^{.2} (\csc 2\theta - \cot 2\theta)^2\,d\theta$

$\int_{.1}^{.2} (\csc^2 2\theta - 2\csc 2\theta \cot 2\theta + \cot^2 2\theta)\,d\theta$

$\int_{.1}^{.2} (2\csc^2 2\theta - 1 - 2\csc 2\theta \cot 2\theta)\,d\theta$

$\left[-\cot 2\theta - \theta + \csc 2\theta\right]_{.1}^{.2}$