

Plan

- Repaso tipos de integrales
- ejercicios
- Tarea
- proxima clase lesion

① $\int \frac{x^2}{\sqrt{1+2x}} dx$ $u^3 = 1+2x$ $\frac{du^3}{2} = \frac{11}{2} du$ ✓

$\int \left(\frac{u^3-1}{2} \right)^2 \cdot \frac{3}{2} u^2 du$ $dx = \frac{3u^2}{2} du$

$\frac{3}{2} \int \left(\frac{u^3-1}{2} \right)^2 u du$ $dx = \frac{3u^2}{2} du$ $du = \frac{3u^2}{2} dx$

$\frac{3}{2} \int \left(\frac{u^6-2u^3+1}{4} \right) u du$

$\frac{3}{8} \int (u^7 - 2u^4 + u) du$

$\frac{3}{8} \left(\frac{u^8}{8} - \frac{2u^5}{5} + \frac{u^2}{2} \right)$ donde $u = \sqrt{1+2x}$

② $\int \frac{x}{\cos^2(x)} dx$

$u = x$ $du = \frac{1}{\cos^2(x)} dx$

$du = dx$ $v = \tan(x)$

$x \tan(x) - \int \tan(x) dx$

$x \tan(x) - (-\ln(x) + C)$

③ $\int_{-1}^1 \frac{x^2}{\sqrt{x^2+1}} dx$ $u = \tan(u)$ $dx = \sec^2(u) du$

$x = -1$ $u = -\pi/4$

$x = 1$ $u = \pi/4$

$\int_{-1}^1 \frac{\tan^2(u)}{\sqrt{\tan^2(u)+1}} \sec^2(u) du \therefore \int_{-\pi/4}^{\pi/4} \frac{\tan^2(u) \sec^2(u)}{\sec(u)} du$

$\int_{-\pi/4}^{\pi/4} \tan^2(u) \sec(u) du$ $\tan^2(u) = \sec^2(u) - 1$

$f(x) = \frac{\sinh(x)}{2} \quad [-\pi, \pi]$

$s = \int_{-\pi}^{\pi} \sqrt{1 + \left(\frac{dy}{dx} \right)^2} dx$ $f'(x) = \frac{1}{2} \cosh(x)$

$s = \int_{-\pi}^{\pi} \sqrt{1 + \left(\frac{\cosh(x)}{2} \right)^2} dx$

$s = \int_{-\pi}^{\pi} \sqrt{\frac{4 + \cosh^2(x)}{4}} dx$