Clase 5   03/10/2020.

Resolver las siguientes ejercicios

$$\int \frac{u e^{3x}}{1+e^{2x}} = \int \frac{u e^{2x}}{1+e^{2x}} \cdot e^x \qquad\qquad U = e^x \qquad U = (e^x)$$

$$U^2 = e^{2}x$$

$$\int \frac{u e^{2x}}{x+u^2} \cdot du \qquad\qquad du = e^x dx$$

$$\int \frac{u u^2}{1+u^2} \, du = u\int \frac{u^2}{1+u^2}$$

$$u\int -\frac{1}{1+u^2} + 1 \; du$$

$$u \left(-\arctan(u) + u \right) + c$$

$$u \left(-\arctan(e^x) + e^x \right) + c$$

$$\int \frac{x^3}{\sqrt{x^2+1}} \, dx \qquad U^2 = x^2+1 \,.\, x = \sqrt{U^2-1} \qquad dx = \frac{x}{\sqrt{U^2-1}} \, du$$

$$\int \frac{\left(\sqrt{U^2-1}\right)^3}{U} \cdot \frac{V}{\sqrt{U^2-1}} \, du$$

$$\int \frac{(U^2-1)^{3/2}}{u} \cdot \frac{u}{(U^2-1)^{1/2}} \, du$$

$$\int \frac{(U^2-1)^{3/3}}{(U^2-1)^{1/2}} \, du$$

$$\int (U^2-1)^{3/2-1/2} \, du$$

$$\int (U^2-1) \, du = (x^2+1)^2 - 1 + c$$

$$\left(\int \frac{ue^{3x}}{1+2^{5x}}\right) \quad \int x\sqrt{1+x}\ dx$$

$$u=1+x \qquad x=u-1 \qquad dx=10$$

$$\int (u-1)(\sqrt{u})\ du$$

$$\int u(\sqrt{u}) - \sqrt{u}\ du$$

$$\int u(u)^{1/2} - u^{1/2}\ du$$

$$\int u^{3/2} - u^{1/2}\ du$$

$$\frac{u^{5/2}}{5/2} - \frac{u^{3/2}}{3/2}\ du = \frac{3}{5}u^{5/2} - \frac{2}{3}u^{3/2}$$

$$\frac{2}{5}(1+1)^{5/2} - \frac{2}{3}(1+x)^{3/2}$$