Integrales

Calcula las siguientes integrales:

$$\int \frac{x}{\sqrt{11-x^2}}dx$$

$$\int 3x^2 e^{x^3} dx$$

$$\int (3x^3 - 2\sqrt{x} + \frac{1}{x} + \frac{3}{x^2})dx$$

$$\int \frac{2}{1+9x^2}dx$$

$$\int \frac{\cos x + senx}{-senx + \cos x}dx$$

$$\int (3^x + \frac{2}{x})dx$$

$$\int \frac{1}{x}\cdot \ln x dx$$

$$\int \frac{6e^x}{1+e^{2x}}dx$$

Soluciones Integrales

Calcula las siguientes integrales:

$$\int \frac{x}{\sqrt{11-x^2}}dx$$

$$=\left[11-x^2=t\ \ dt=-2xdx;\ xdx=\frac{-dt}{2}\right]=\frac{-1}{2}\int t^{-\frac{1}{2}}dt=-\frac{1}{2}\frac{t^{\frac{1}{2}}}{\frac{1}{2}}+c=-\sqrt{11-x^2}+c$$

$$\int 3x^2e^{x^3}dx=\left|x^3=t,dt=3x^2dx\right|=\int e^t dt=e^t+c=e^{x^3}+c$$

$$\int(3x^3-2\sqrt{x}+\frac{1}{x}+\frac{3}{x^2})dx=\int 3x^3dx-2\int x^{\frac{1}{2}}dx+\int\frac{1}{x}dx+3\int x^{-2}dx=$$

$$=3\frac{x^4}{4}-2\frac{x^{\frac{3}{2}}}{\frac{3}{2}}+\ln x+3\frac{x^{-1}}{-1}+c=\frac{3x^4}{4}-2\sqrt{x}+\ln x-\frac{3}{x}+c$$

$$\int\frac{2}{1+9x^2}dx=2\int\frac{1}{1+(3x)^2}dx=\left[3x=t;dt=3dx\right]=2\cdot\frac{1}{3}\int\frac{dt}{1+t^2}=\frac{2}{3}arctgt+c=\frac{2}{3}arctg\,3x+c$$

$$\int(3^x+\frac{2}{x})dx=\int 3^x dx+\int\frac{2}{x}dx=\frac{1}{\ln 3}3^x+2\ln x+c$$

$$\int\frac{\cos x+senx}{-senx+\cos x}dx=\left[-senx+\cos x=t;dt=(-\cos x-senx)dx=-(\cos x+senx)dx\right]=\int\frac{-dt}{t}=-\ln t+c=-\ln(-senx+\cos x)+c$$

$$\int\frac{1}{x}\cdot\ln xdx=\left[\ln x=t;dt=\frac{1}{x}dx\right]=\int t\cdot dt=\frac{t^2}{2}+c=\frac{\ln^2 x}{2}+c$$

$$\int\frac{6e^x}{1+e^{2x}}dx=6\int\frac{e^x}{1+(e^x)^2}dx=\left[e^x=t;dt=e^xdx\right]=6\int\frac{t}{1+t^2}dt=6arctgt+c=6arctge^x+c$$