WORKSHEET - 01

1. Find the indefinite integrals, where $u = f(x)$:

1.1 $\int u'.u^{\alpha}dx$ **:**

1.1.1 $\int x^5 dx$

1.1.2 $\int \frac{sen(x)}{cos^3(x)}\,dx$

1.1.3 $\int \frac{4}{\sqrt[4]{2x-1}}\,dx$

1.2 $\int \frac{u'}{u}dx$ **:**

1.2.1 $\int \frac{1}{1+x}\,dx$

1.2.2 $\int \frac{4x-8}{3x^2-12x}\,dx$

1.2.3 $\int \frac{e^{3x}}{2+e^{3x}}\,dx$

1.3 $\int u'.a^u dx,\quad a \in \mathbb{R}^+ \setminus \{1\}$ **:**

1.3.1 $\int e^{5x}\,dx$

1.3.2 $\int sen(x).e^{cos(x)}dx$

1.3.3 $\int 4x.7^{x^2+1}\,dx$

1.4 $\int u'.sen(u)dx$ **:**

1.4.1 $\int sen(2x-6)dx$

1.4.2 $\int 2^x\, sen(2^x+\pi)dx$

1.4.3 $\int \frac{sen[ln(3x)]}{x}\,dx$

1.5 $\int u'.cos(u)dx$ **:**

1.5.1 $\int cos(2x)dx$

1.5.2 $\int cos[log(x)]\frac{dx}{x}$

1.5.3 $\int e^{2x}\,cos(e^{2x}+1)dx$

1.6 $\int u'.sec^2(u)\,dx$ **:**

1.6.1 $\int \frac{dx}{cos^2(3x)}$

1.6.2 $\int \frac{e^x}{cos^2\left(e^{x+1}\right)}\,dx$

1.6.3 $\int \frac{sec^2\left(\sqrt{x}+3\right)}{\sqrt{x}}\,dx$

1.7 $\int u'.cosec^2(u)\,dx$ **:**

1.7.1 $\int \frac{12x}{sen^2\left(1-3x^2\right)}\,dx$

1.7.2 $\int \frac{cosec^2\left(1+e^{-x+1}\right)}{e^x}\,dx$

1.7.3 $\int \frac{cosec^2\left(3\sqrt[3]{x^2}+2\right)}{\sqrt[3]{x}}\,dx$

1.8 $\int \frac{u'}{u^2+1}\,dx$ **:**

1.8.1 $\int \frac{4}{3x^2+2}\,dx$

1.8.2 $\int \frac{cos(x)}{sen^2(x)+1}\,dx$

1.8.3 $\int \frac{dx}{\sqrt{x}(x+1)}$

1.9 $\int \frac{u'}{u^2+1}\,dx$ **:**

1.9.1 $\int \frac{1}{\sqrt{1-4x^2}}\,dx$

1.9.2 $\int \frac{dx}{\sqrt{9-4x^2}}$

1.9.3 $\int \frac{dx}{(1+x^2)\sqrt{1-[artg(x)]^2}}$

WORKSHEET SOLUTIONS

1.1.1 $\frac{x^6}{6}+C$ **1.1.2** $\frac{1}{2\cos^2(x)}+C$ **1.1.3** $\frac{8}{3\sqrt[4]{(2x-1)^3}}+C$

1.2.1 $\log|x+1|+C$ **1.2.2** $2\log|x^2-4x|/3+C$ **1.2.3** $\log(2+e^{3x})/3+C$

1.3.1 $e^{5x}/5+C$ **1.3.2** $-e^{\cos(x)}+C$ **1.3.3** $2.7^{x^2+1}/\ln(7)+C$

1.4.1 $-\cos(2x-6)/2+C$ **1.4.2** $-\cos(2^x+\pi)/\ln(2)+C$ **1.4.3** $-\cos\left[\ln(3x)\right]+C$

1.5.1 $\text{sen}(2x)/2+C$ **1.5.2** $\text{sen}\left[\log(x)\right]+C$ **1.5.3** $\text{sen}(e^{2x}+1)/2+C$

1.6.1 $\text{tg}(3x)/3+C$ **1.6.2** $\text{tg}(e^{x+1})/e+C$ **1.6.3** $2\,\text{tg}(\sqrt{x}+3)+C$

1.7.1 $2\,\text{cotg}(1-3x^2)+C$ **1.7.2** $\text{cotg}(1+e^{-x+1})/e+C$ **1.7.3** $\text{cotg}(3\sqrt[3]{x^2}+2)/2+C$

1.8.1 $\frac{2\sqrt{6}}{3}\,\text{arctg}\left(\sqrt{\frac{3}{2}}\,x\right)+C$ **1.8.2** $\text{arctg}(\text{sen}(x))+C$ **1.8.3** $2\,\text{arctg}(\sqrt{x})+C$

1.9.1 $\text{arcsen}(2x)/2+C$ **1.9.2** $\text{arcsen}(2x/3)/2+C$ **1.9.3** $\text{arcsen}(\text{arctg}(x))+C$