Nombre de alumnos: Ochoa Alvarado Andrea

Nombre del profesor: Ojeda Trujillo Juan José

Nombre del trabajo: Trabajos

Materia: Matemática Aplicada

Grado: 6

Grupo: A

Comitán de Domínguez Chiapas.

Andrea ochoa Alvarado

1° $\int x^5\,dx = \frac{x^6}{6} + C$

$u = x$

$m = 5$

$m+1 = 6$

2° $\int \frac{dx^2}{x^2} = \int x^{-2}\,dx = \frac{x^{-1}}{-1} + C = \frac{1}{x} + C$ $\quad \frac{x^{-1}}{-1} + C$ $\quad u = x$ $\quad m = -2$ $\quad m+1 = -1$

3° $\sqrt[3]{x^4}\,dx = \int x^{4/3}\,dx = \frac{x^{7/3}}{\frac{7}{3}} + C = \frac{3x^{4/3}}{4} + C$

$= \frac{3\sqrt[3]{x^4}}{4} + C$

$u = x$ $\quad m = 4/3$ $\quad m+1 = 7/3$ $\quad \times 4/3 \times 3$

4° $\int \sqrt[3]{\frac{dx^2}{x^2}} = \int x^{-2/3}\,dx = \frac{x^{1/3}}{\frac{1}{3}} + C = \frac{3x^{1/3}}{1} + C = 3\sqrt[3]{x} + C$

$u = x$ $\quad m = -2/3$ $\quad m+1 = 1/3$

5° $\int (2x^2 - 5x + 3)\,dx = \int x^2\,dx - 5\int x\,dx + 3\,dx$ $\quad \frac{2x^3}{3} - \frac{5x^2}{2} + 3x + C$

$u = x$ $\quad m = 2$ $\quad m+1 = 3$ $\quad u = x$ $\quad m = 1$ $\quad m+1 = 2$

6° $\int (1-x)\sqrt{x}\,dx = \int (1-x)\,x^{1/2}\,dx \int x^{1/2} - x^{3/2}\,dx$ $\quad \int x^{1/2}\,dx - \int x^{3/2}\,dx$

$\frac{2x^3}{3} - \frac{2x^{5/3}}{5} + C$

$\frac{x^{3/2}}{\frac{3}{2}} - \frac{x^{5/2}}{\frac{5}{2}} + C$

$\frac{2\sqrt{x^3}}{3} - \frac{2\sqrt[2]{x^5} + C}{5}$

$u = x$ $\quad m = -1/2$ $\quad m+1 = 3$

$u = x$ $\quad m = 3/2$ $\quad m+1 = 5/2$

$\int \sqrt{3x+1}\,dx$ $\quad v = 3x+1$ $\quad dx = 3dx$ $\quad \frac{dy}{3} = dx$

$\int \sqrt{v}\,\frac{du}{3} = \frac{1}{3}\int \sqrt{v}\,dx$ $\quad \int u\,du = \frac{b^{n+1}}{n+1}$

$\frac{1}{3}\int v^{1/2}\,du = \frac{1}{3}\,\frac{v^{1/2+1}}{\frac{1}{2}+1}$

$\frac{1}{3}\,\frac{v^{3/2}}{\frac{3}{2}} = \frac{1}{3}\,\frac{v^2}{\frac{2v^{3/2}}{3}} = \frac{2v^{3/2}}{9}$

$= \frac{2(3x+1)^3}{9} = 2\,\frac{\sqrt[3]{(3x+1)^3}}{9} + C$

$\int (3x+1)^2\,dx \quad \int \frac{x^3+5x^2-4}{x^2}\,dx \quad \int \frac{(1+x)^2}{\sqrt{x}}\,dx$

$\int (9x^2+24x+16)\,dx$

$9\int x^2 + 24\int x\,dx + 16\int dx$

$\frac{9x^3}{3} + \frac{24x^2}{2} + 16x + C$

$\boxed{3x^3+12x^2+16x+C}$

$\int x\,dx + 5\int dx - 4\int \frac{dx}{x^2}$

$x^{-2}\,dx = \frac{x^{-1}}{-1} = \frac{-1}{x}$

$\boxed{\frac{x^2}{2} + 5x + \frac{4}{x} + C}$

$\frac{1+2x+x^2}{\sqrt{x}} = \frac{1}{x^{1/2}} + \frac{2x}{x^{1/2}} + \frac{x^2}{x^{1/2}}$

$x^{1/2} + 2x(x^{1/2}) + x^2(x^{-1/2})$

$\int (x^{-1/2} + 2x^{1/2} + x^{3/2})\,dx$

$\frac{x^{1/2}}{1/2} + \frac{2x^{3/2}}{3/2} + \frac{x^{5/2}}{5/2} + C$

$2\sqrt{x} + \frac{4}{3}\sqrt{x^3} + \frac{2\sqrt{x^5}}{5} + C$

or $\sqrt{x} - \frac{1}{2}x + \frac{2}{5}$

Andrea ochoa Alcavado

$\int (e^x+1)^2\,dx = \int (e^{x^2}+2e^x+1)\,dx$
$= \int e^{2x} + 2\int e^x + \int dx$
$\frac{1}{2}e^{2x} + 2e^x + x + C$

$\int \sqrt{16-9x^2}\,dx = \frac{1}{2}(3x)\sqrt{16-9x^2} + \frac{1}{2}(16)\,\text{ARCSEN}\,\frac{3x}{4} + C$
$9x^2 = 16 = A = 4$ $\quad \frac{3x}{2}\sqrt{16-9x^2} + 8\,\text{ARCSEN}\,\frac{3x}{4} + C$
$u^2 = 9x^2 = u\,3x$

$\int \frac{dx}{4x^2-9} = \frac{u^2}{4x^2} \quad \frac{u\,2x}{a^2=9} \quad a=3 \quad \frac{1}{6}\ln\left|\frac{2x-3}{2x+3}\right| + C$

$\int \frac{(x+6)(x-2)}{\sqrt{x}}\,dx = \int \frac{x^2-x-2}{\sqrt{x}}\,dx = \int \frac{x^2}{\sqrt{x}}\,dx - \int \frac{x}{\sqrt{x}}\,dx - 2\int \frac{dx}{\sqrt{x}}$
$= \int x^{2}\cdot x^{-1/2}\,dx - \int x\cdot x^{1/2}\,dx \quad = \frac{x^{5/2}}{5/2} - \frac{x^{3/2}}{3/2} - \frac{x^{1/2}}{1/2} + C$
$= \frac{2}{5}\sqrt{x^5} - \frac{2}{3}\sqrt{x^3} - 4\sqrt{x} + C$

$\int \frac{(1+\sqrt{x})^2}{\sqrt{x}}\,dx = \int \frac{(2\sqrt{x}+2)}{\sqrt{x}}\,dx$
$= \int \frac{dx}{\sqrt{x}} + 2\int \frac{\sqrt{x}}{\sqrt{x}}\,dx + \int \frac{x}{\sqrt{x}}\,dx$
$= \int x^{-1/2}\,dx + 2\int dx + \int x^{1/2}\,dx \quad = \frac{x^{1/2}}{\frac{1}{2}} + 2x + \frac{x^{5/2}}{5/2} + C$
$= 2\sqrt{x} + 2x + \frac{2}{5}\sqrt{x^5} + C.$

$\int \frac{1}{x-2}\,dx = \frac{1}{2\sqrt{2}}\ln\left|\frac{\sqrt{x}-\sqrt{2}}{\sqrt{x}+\sqrt{2}}\right| + C$
$u = x$
$u = \sqrt{x}$
$a^2 = 2$
$a = \sqrt{2}$

$\int \frac{dx}{x^2-49} = \frac{1}{2(7)}\ln\left|\frac{x-7}{x+7}\right| + C$
$= \frac{1}{14}\ln\left|\frac{x-7}{x+7}\right| + C$
$u^2 = x^2$
$u = x$
$a^2 = 49$
$a = 7$

Ejemplo 3

$\int \sqrt[3]{x}\,dx = \int x^{1/3}\,dx = \frac{x^{4/3}}{\frac{4}{3}} + C$

$u = x$

$m = 1/3$

$m+1 = 4/3$ $= \frac{3x^{4/3}}{4} + C$

$= \boxed{\frac{3\sqrt[3]{x^4}}{4} + C}$

$\int \frac{dx}{\sqrt[3]{x^2}}$ $\int (2x^2 - 5x + 3)\,dx$ $\int (1-x)\sqrt{x}\,dx$

$\int x^{-2/3}\,dx = \int x^{-2/3}\,dx = \frac{x^{1/3}}{\frac{1}{3}} + C = \boxed{3\sqrt[3]{x} + C}$

$\int (2x^2 - 5x + 3)\,dx$ $\int (1-x)\sqrt{x}\,dx$

$\int 2x^2\,dx - \int 5x\,dx + \int 3\,dx$ $\int u^m\,du = \frac{u^{m+1}}{m+1} + C$

$2\int x^2\,d - 5\int x\,dx + 3\int dx$

$\boxed{\frac{2x^3}{3} - \frac{5x^2}{2} + 3x + C}$

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

$(1-x)\sqrt{x}$ $\frac{2}{2} + \frac{1}{2} = \frac{3}{2}$ $= 2\frac{\sqrt[3]{x^3}}{3} - \frac{2}{5}\sqrt[3]{x^5}$

$(1-x)\,x^{1/2}$

$\int x^{1/2} - x^{3/2}\,dx$

$\int x^{1/2}\,dx - \int x^{3/2}\,dx = \frac{x^{3/2}}{\frac{3}{2}} - \frac{x^{5/2}}{\frac{5}{2}} + C$