UDS
PASIÓN POR EDUCAR

NOMBRE DEL ALUMNO: MAURICIO CASTILLO OZUNA

NOMBRE DEL MAESTRO: JUAN JOSÉ OJEDA TRUJILLO

NOMBRE DEL TRABAJO: EXAMEN FINAL

MATERIA: MATEMÁTICA APLICADA

GRADO: SEXTO CUATRIMESTRE

GRUPO: ÚNICO

1. $\int \text{sen}^2 x \; dx$

$\int \dfrac{1 - \cos(2x)}{2} \; dx$

$\dfrac{1}{2} \times \int 1 - \cos(2x) \; dx$

$\dfrac{1}{2} \times \left(\int 1 \, dx - \int \cos(2x) \, dx \right)$

$\dfrac{1}{2} \times \left(x - \dfrac{\sin(2x)}{2} \right)$

$\dfrac{1}{2} x - \dfrac{\sin(2x)}{4} + C$

$$2 = \frac{\int sen^3 \, x}{3} \, dx$$

$$\frac{1}{3} \times \int sen(x)^3 \, dx$$

$$\frac{1}{3} \times \int sen(x)^2 \, sen(x) \, dx$$

$$\frac{1}{3} \times \int -1 + t^2 \, dt$$

$$\frac{1}{3} \times \left(-\int 1 \, dt + \int t^2 \, dt \right)$$

$$\frac{1}{3} \times \left(-t + \frac{t^3}{3} \right)$$

$$\frac{1}{3} \times \left(-Cos(x) + \frac{Cos(x)^3}{3} \right)$$

$$- \frac{Cos(x)}{3} + \frac{Cos(x)^3}{9} + C$$

3.- $\int \operatorname{sen}^2 x + \operatorname{Cos}^2 x \, dx$

$\int 1 \, dx$

$x + C$

$$4: \quad \int \frac{\cos^3 2x}{3} \, dx$$

$$\frac{1}{3} \times \int \cos(2x)^3 \, dx$$

$$\frac{1}{3} \times \int \frac{\cos(t)^3}{2} \, dt$$

$$\frac{1}{3} \times \frac{1}{2} \times \int \cos(t)^3 \, dt$$

$$\frac{1}{6} \times \int \cos(t)^2 \cos(t) \, dt$$

$$\frac{1}{6} \times \int 1 - u^2 \, du$$

$$\frac{1}{6} \times \left(\int 1 \, du - \int u^2 \, du \right)$$

$$\frac{1}{6} \times \left(u - \frac{u^3}{3} \right)$$

$$\frac{1}{6} \times \left(\sin(t) - \frac{\sin(t)^3}{3} \right)$$

$$\frac{1}{6} \times \left(\sin(2x) - \frac{\sin(2x)^3}{3} \right)$$

$$\frac{\sin(2x)}{6} - \frac{\sin(2x)^3}{18} + C$$

5:- $\int \sec^4 2x \; dx$

$\int \dfrac{\sec(t)^4}{2} \; dt$

$\dfrac{1}{2} \times \int \sec(t)^4 \; dt$

$\dfrac{1}{2} \times \left(\dfrac{1}{3} \times \sec(t)^2 \tan(t) + \dfrac{2}{3} \times \int \sec(t)^2 \; dt \right)$

$\dfrac{1}{2} \times \left(\dfrac{1}{3} \times \sec(2x)^2 \tan(2x) + \dfrac{2}{3} \times \tan(2x) \right)$

$\dfrac{\sin(2x)}{6 \cos(2x)^3} + \dfrac{\tan(2x)}{3 \cos(2x)} + C$

6- $\int (2x^2 - 5x + 3) \, 3 \, dx$

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

$3 \left(\int 2x^2 \, dx - \int 5x \, dx + \int 3 \, dx \right)$

$3 \left(\dfrac{2x^3}{3} - \dfrac{5x^2}{2} + 3x \right)$

$2x^3 - \dfrac{15x^2}{2} + 9x + C$

7.- $\int \dfrac{(x^3 + 5x^2 - 4)}{x^2}\, dx$

$\int \dfrac{x^3}{x^2} + \dfrac{5x^2}{x^2} - \dfrac{4}{x^2}\, dx$

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

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

$\dfrac{x^2}{2} + 5x + \dfrac{4}{x} + C$

$$8 = \int \frac{(x^2)}{(4\sqrt{x^3 + 2}}\, dx$$

$$\frac{1}{4} \int \frac{x^2}{\sqrt{x^3 + 2}}\, dx$$

$$\frac{1}{4} \left(\frac{2}{3} \cdot \right)$$

$$\frac{1}{4} \left(\frac{2}{3}\right)\left(\sqrt{x^3 + 2}\right)$$

$$\frac{1}{6} \left(\sqrt{x^3 + 2}\right) + C$$

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

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

$3 \times \int -\frac{1}{2} \times \sqrt{t} \, dt$

$3 \times \left(-\frac{1}{2}\right) \times \int \sqrt{t} \, dt$

$-\frac{3}{2} \times \int t^{\frac{1}{2}} \, dt$

$-\frac{3}{2} \times \frac{2t\sqrt{t}}{3}$

$-\frac{3}{2} \times \frac{2(1-x^2)\sqrt{1-x^2}}{3}$

$\underline{(-1+x^2)\sqrt{1-x^2} + C}$

10. $\int \dfrac{(1+x)^2}{\sqrt{x}}\, dx$

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

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

$\int \dfrac{1}{x^{\frac{1}{2}}} + 2x^{\frac{1}{2}} + x^{\frac{3}{2}}\, dx$

$\int \dfrac{1}{x^{\frac{1}{2}}}\, dx + \int 2x^{\frac{1}{2}}\, dx + \int x^{\frac{3}{2}}\, dx$

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