UDS UNIVERSIDAD DEL SURESTE

"Pasión por educar"

"MATERIA". MATEMÁTICAS APLICADA

NOMBRE DEL DOCENTE. JUAN JOSE OJEDA

PRESENTA: EXAMEN

ALUMNO:CITLALI LÓPEZ JIMÉNEZ .

SEXTO SEMESTRE

LICENCIATURA

SEMIESCOLARIZADO

FECHA DE ENTREGA: 7-julio-2021

$$1\int_{-2} SEN^2 x\,dx$$

$$= -\frac{\cos x \, SEN x}{2} + \frac{1}{2}\int 1\,dx$$

$$= -\frac{\cos x \, SEN x}{2} + \frac{x}{2} + C$$

$$= \frac{x - \frac{SEN\,2x}{2}}{2}\Bigg|_{-2}^{2} + C$$

$$= -\frac{SEN\ 4 - 4}{2} = 2,378$$

$$2\int_{-3}^{3} \operatorname{SEN}^3 \frac{x}{3}\, dx$$

$$u = \frac{x}{3} \qquad \frac{du}{dx} = \frac{1}{3}$$

$$dx = 3\,du$$

$$= 3\int_{-3}^{3} \operatorname{SEN} u\, du$$

$$= \int_{-3}^{3} (1 - \cos^2(u))\, du$$

$$v = \cos u \qquad \frac{dv}{du} = \operatorname{SEN} u \qquad du = \frac{-1\, dv}{\operatorname{SEN} u}$$

$$= \int_{-3}^{3} (v^2 - 1)\, dv = \int_{-3}^{3} v^2\, dv - \int_{-3}^{3} 1\, dv$$

$$= \frac{v^3}{3} - v = \frac{\cos^3 u}{3} - \cos u$$

$$= \cos^3 \frac{x}{3} - 3 \cos \frac{x}{3} \Big]_{-3}^{3} = 0$$

$$3\int_{\pi/2}^{\pi} \operatorname{SEN}^2 x \cos^2 x \, dx = \int_{\pi/2}^{\pi} 1 \, dx = x\Big]_{\pi/2}^{\pi} = 1.57$$

$$4\int_{\pi/2}^{\pi} \cos^3 \frac{2}{3}x \, dx = \int_{\pi/2}^{\pi} \cos^3 u \, du = \int_{\pi/2}^{\pi} \cos u \,(1-\operatorname{SEN}^2 u)\, du$$

$$u = \frac{2}{3}x \qquad du = \frac{2}{3}dx$$

$$dx = \frac{3}{2}\,du$$

$$= \int_{\pi/2}^{\pi} (1-v^2)\, du = \int_{\pi/2}^{\pi} 1\, du - \int v^2\, du$$

$$v = \operatorname{SEN} u \qquad \frac{du}{dv} = \cos u$$

$$du = \frac{1}{\cos u}\, du$$

$$= v + \frac{v^3}{3} = \operatorname{SEN} u - \frac{\operatorname{SEN} u^3}{3}$$

$$= \frac{3\operatorname{SEN}\left(\frac{2}{3}x\right)}{2} = \frac{\operatorname{SEN}\left(\frac{2x}{3}\right)}{2}\Big]_{\pi/2}^{\pi} = 9$$

$$5\int_{-\pi/12}^{\pi} \sec^4 2x\,dx = \int_{-\pi/12}^{\pi} \sec^2 u\,(\tan^2 u + 1)\,du$$

$u = 2x \quad \frac{du}{dx} = 2$

$dx = 1/2\,du$

$= \int_{-\pi/12}^{\pi} (v^2+1)\,du = \frac{v}{3} + v = \frac{\tan^3 u}{3} + \tan u$

$v = \tan u \quad \frac{dv}{du} = \sec^2 u$

$du = \frac{1}{\sec^4}\,dv$

$= \frac{\tan^2(2x)}{6} + \frac{\tan 2x}{2}\Big]_{-\pi/12}^{\pi}$

LA INTEGRAN ES DIVERGENTE

$$6\int_{-\pi/12}^{\pi/2} \operatorname{sen} 2x \cos 3x\,dx = \int_{-\pi/12}^{\pi} \frac{\operatorname{sen} 5x\,dx - \operatorname{sen} x\,dx}{2}$$

$u = 5x \quad \frac{du}{dx} = 5$

$dx = \frac{1}{5}\,du$

$= \frac{1}{2}\int_{-\pi/12}^{\pi} \operatorname{sen} 5x\,dx - \frac{1}{2}\int_{-\pi/2}^{\pi} \operatorname{sen} x\,dx$

$= \frac{1}{2}\left[-\frac{\cos 5x}{5} - \frac{\cos x}{2}\right]_{-\pi/12}^{\pi}$

$= \frac{\cos 5x - 5\cos x}{10}\Big]_{-\pi/2}^{\pi} = -\frac{2}{5}$

7) $\int_{-3}^{3} (1+\cos 3x)\frac{3}{2}\,dx = \int_{-3}^{3} \frac{3(\cos(3x)+1)}{2}\,dx$

$u = 3x \quad \frac{du}{dx} = 3 \quad = \frac{3}{2}\int \cos 3x\,dx + 3\int 1\,dx$

$du = 3\,dx$

$= \frac{3}{2}\left[\frac{\text{SEN } 3x}{3} - x\right]_{-3}^{3} = \frac{\text{SEN } 3x}{2} + \frac{3x}{2}\Big]_{-3}^{3}$

$= \text{SEN } 9 + 9 = 9,412$

8) $\int_{-4}^{1} 1 - \text{SEN } 2x\,dx = \int_{-4}^{1} dx - \int \text{SEN } 2x\,dx = x - \cos u\Big]_{-4}^{1}$

$u = 2x \quad \frac{du}{dx} = 2 \quad = x - \left(-\cos\frac{2x}{2}\right)\Big]_{-4}^{1}$

$dx = \frac{1}{2}\,du$

$= \cos\frac{2x}{2} + x\Big]_{-4}^{1}$

$= \frac{\text{Co}(e - \cos 2 - 10}{2} = 4,86$