

# EXAMEN



- Materia: MATEMATICA aplicada
- Carrera: TEC. ENFERMERIA
- Semestre/
- BRENDA MAYARI ALVARADO BRAVO

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$$1.- \int x^2 \operatorname{sen} x \, dx$$

$$u = x^2 \quad du = 2x \, dx$$

$$du = 2x$$

$$x^2 \operatorname{sen} x - \int 2x \cos x \, dx$$

$$u = 2x \quad du = \cos x$$

$$du = 2 \quad v = \operatorname{sen} x \quad -2x \cos x + \int 2 \operatorname{sen} x \, dx$$

$$x^2 \operatorname{sen} x - 2x \cos x + 2 \cos x + C$$

$$R = x^2 \operatorname{sen} x - \cos x (2x - 2) + C$$

$$2.- \int x^3 e^2 x \, dx$$

$$\int x^4 e^2 \, dx \quad e^2 x \left( \frac{x^5}{5} \right)$$

$$e^2 \int x^4 \, dx \quad \frac{e^2 \cdot x^5}{5}$$

$$\frac{e^2 x^5}{5} - C \quad R = \frac{e^2 x^5}{5} + C$$

$$3. \int x^2 \sqrt{1-x} dx \quad \frac{d}{dx}(1-x) = \frac{d}{du}(u^2)$$

$$\int (-2u^6 + 4u^4)$$

$$\int -2u^6 du + \int 4u^4 + \int -2u^2$$

$$\frac{-2}{7} u^7 + \frac{4}{5} u^5 - \frac{2}{3} u^3$$

$$\frac{2(1-x)^{7/2}}{7} + \frac{4(1-x)^{5/2}}{5} - \frac{2(1-x)^{3/2}}{3}$$

$$R = \frac{2(15x^2 + 12x + 8)(1-x)^{3/2}}{105}$$

$$4. \int e^{ax} \cos bx dx$$

$$ea \int x \cos(bx) dx$$

$$\left( \frac{ea(x \sin(bx))}{b} - \int \frac{\sin(bx) dx}{b} \right)$$

$$ea \left( \frac{x \sin(bx)}{b} + \frac{\cos(bx)}{b^2} \right)$$

$$ea(x \sin(bx) + \cos(bx)) + C$$

$$R = \frac{e \cdot a (\cos(b \cdot x) + \sin(b \cdot x) b \cdot x) + C}{b^2}$$

$$5. \int \sin^3 x \, dx$$

$$\int (1 - \cos(x)^2) \sin(x) \, dx$$

$$\int (\cos(x)^2 \sin(x) + \sin(x)) \, dx$$

$$\frac{u^3}{3} + \int \sin(x) \, dx$$

$$\frac{\cos(x)^3}{3} - \cos(x)$$

$$R = -\frac{(1 + \sin(x)^2) \cos(x)}{3} + C$$

$$6. \int x^2 \ln x \, dx$$

$$v = x^2 \quad v = \frac{x}{3}$$

$$dv = \frac{1}{x}$$

$$\frac{x^3}{3} \ln x - \int \frac{x^3}{3} \cdot \frac{1}{x} \, dx$$

$$\int \frac{x^3}{3x} \, dx$$

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

$$\frac{x^3}{3} \ln x - \frac{1}{3} \cdot \frac{x^3}{3} + C$$

$$R = \frac{x^3}{3} \ln x - \frac{x^3}{9} + C$$

$$7. \int x^2 \ln x \, dx$$

$$v = x^2 \quad du = \ln x$$

$$v = \ln x \quad du = x^2$$

$$du = \frac{1}{x} \quad v = \frac{x^3}{3}$$

$$\frac{x^3}{3} \ln x - \int \frac{x^3}{3} \cdot \frac{1}{x} \, dx$$

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

$$\frac{x^3}{3} \ln x - \frac{1}{3} \cdot \frac{x^3}{3} + C$$

$$\int \frac{x^3}{3x} \, dx$$

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

$$R = \frac{x^3}{3} \ln x - \frac{x^3}{9} + C$$

$$8. \int \ln x^2 \cos x \, dx$$

$$\int 1 \ln x^2 \cos(x) \, dx$$

$$1 \ln x^2 \cos(x) \, dx$$

$$R = \ln(x^2) - \sin(x) + 2x - 2 + C$$