



UNIVERSIDAD DEL SURESTE DE LA FRONTERA: COMALAPA.

ASIGNATURA: Cálculo Diferencial E Integral.

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ALUMNO: Ramiro Gerardo Resendíz Valdéz.

CUATRIMESTRE: Segundo (2do).

CARRERA: Ingeniería en sistemas computacionales.

PARCIAL: Cuarto (4^{to}).

TRABAJO: Actividad 2 (Integrales definidas algebraicas).

FECHA: 11 de abril del 2021.

Integrales definidas: ejercicios.

① $\int_1^2 x^4 dx = \frac{x^{4+1}}{4+1} = \frac{x^5}{5} \Big|_1^2 = \dots$ fórmula $y \Big|_a^b = (b) - (a)$

$= \frac{(2)^5}{5} - \frac{(1)^5}{5} = \frac{32}{5} - \frac{1}{5} = \frac{31}{5}$

$A = \frac{31}{5} U^2$

② $\int_3^5 3x dx = 3 \int_3^5 x dx = \frac{3x^2}{2} \Big|_3^5 = \frac{3(5)^2}{2} - \frac{3(3)^2}{2}$

$= \frac{3(25)}{2} - \frac{3(9)}{2} = \frac{75}{2} - \frac{27}{2} = \frac{48}{2}$

$A = \frac{48}{2} U^2$

③ $\int_1^3 (5x^2 - 2x + 3) dx = \left[\int_1^3 5x^2 dx - 2 \int_1^3 x dx + 3 \int_1^3 dx \right]$

$= \left[\frac{5x^3}{3} - \frac{2x^2}{2} + 3x \right]_1^3 = \left[\frac{5x^3}{3} - x^2 + 3x \right]_1^3 = \dots$

$= \frac{5(3)^3}{3} - 3^2 + 3(3) - \left(\frac{5(1)^3}{3} - 1^2 + 3(1) \right)$

$= \frac{5(27)}{3} - 9 + 9 - \left(\frac{5}{3} - 1 + 3 \right) = \frac{135}{3} - \frac{5}{3} + 1 - 3$

$= \frac{135 - 5 + 1 - 9}{3} = \frac{128}{3}$ $A = \frac{128}{3} U^2$

$$\begin{array}{r|l} 3 & 72 \\ \hline 3 & 24 \\ 1 & 8 \\ 1 & 8 \end{array}$$

$$\begin{array}{r|l} 3 & 11 & 3 & 21 \\ \hline 3 & 11 & 3 & 21 \\ 1 & 1 & 1 & 1 \end{array}$$

$$\textcircled{4} \int_1^2 (3x^2 + x + 2) dx = \left[3 \int x^2 dx + \int x dx + 2 \int dx \right]_1^2 =$$

$$\left[\frac{3x^3}{3} + \frac{x^2}{2} + 2x \right]_1^2 = \left[\frac{x^3}{3} + \frac{x^2}{2} + 2x \right]_1^2$$

$$= \frac{2^3}{3} + \frac{2^2}{2} + 2(2) - \left(\frac{1^3}{3} + \frac{1^2}{2} + 2(1) \right)$$

$$= \frac{8}{3} + \frac{4}{2} + 4 - \frac{1}{3} - \frac{1}{2} - 2$$

$$= \frac{8}{3} + 2 + 4 - \frac{1}{3} - \frac{1}{2} - 2 = \frac{8+2+4-1-1-2}{6}$$

$$= \frac{10}{6} = \frac{5}{3} \quad \boxed{A = \frac{5}{3} U^2}$$

$$\textcircled{5} \int_{-3}^2 (2x^2 - 3x) dx = \left[2 \int x^2 dx - 3 \int x dx \right]_{-3}^2$$

$$= \left[\frac{2x^3}{3} - \frac{3x^2}{2} \right]_{-3}^2 = \frac{2(2)^3}{3} - \frac{3(2)^2}{2} - \left(\frac{2(-3)^3}{3} - \frac{3(-3)^2}{2} \right)$$

$$= \frac{2(8)}{3} - \frac{3(4)}{2} - \left(\frac{2(-27)}{3} - \frac{3(9)}{2} \right)$$

$$= \frac{16}{3} - \frac{12}{2} + \frac{54}{3} + \frac{27}{2} = \frac{16-6+18+27}{6}$$

$$= \frac{16-6+18+27}{6} = \frac{55}{6} \quad \boxed{A = \frac{55}{6} U^2}$$