TÍTULO Integrales . Viridiana Merida Ortiz FECHA

1) $\int x^4 dx$ $\int x^n dx = \frac{x^{n+1}}{n+1} + C$

$\int x^4 dx = \frac{x^{4+1}}{4+1} + C$

$\int x^4 dx = \frac{x^5}{5} + C = \frac{1}{5}x^5 + C$

2) $\int 3x^2 dx$ $\int k \cdot f(x) dx = k \cdot \int f(x) dx$

$3\int x^2 dx = 3\frac{x^{2+1}}{2+1} + C$

$3\int x^2 dx = 3\frac{x^3}{3} + C = x^3 + C$

3) $\int (3x^2 + 2x + 6x^3 + 1) dx$ $\int [f(x) \pm g(x)] dx = \int f(x) dx \pm \int g(x) dx$

$= \int 3x^2 dx + \int 2x dx + \int 6x^3 dx + \int x dx$

$= 3\int x^2 dx + 2\int x dx + 6\int x^3 dx + \int x dx$

$= 3\frac{x^{2+1}}{2+1} + 2\frac{x^{1+1}}{1+1} + 6\frac{x^{3+1}}{3+1} + \frac{x^{1+1}}{1+1} + C$

$= \frac{3x^3}{3} + \frac{2x^2}{2} + \frac{6x^4}{4} + \frac{x^2}{2} + C$

$= x^3 + x^2 + \frac{6}{4}x^4 + \frac{x^2}{2} + C$

4) $\int \frac{2x^2 + 3x^4 + x + 5}{x} \cdot dx$ $\int [f(x) \pm g(x)] dx = \int f(x) dx \pm \int g(x) dx$

$= \int \frac{2x^2}{x} dx + \int \frac{3x^4}{x} dx + \int \frac{x}{x} dx + \int \frac{5}{x} dx$

$= 2\int x\, dx + 3\int x^3 dx + \int dx + 5\int \frac{dx}{x}$

$= \frac{2x^2}{2} + \frac{2x^4}{4} + x + 5 \cdot Ln|x| + C$

$= x^2 + \frac{2}{4}x^4 + x + 5 \cdot Ln|x| + C$

5) $\int \sqrt{x} \cdot \left(x + \frac{3}{x}\right) dx$

$= \int x \cdot \sqrt{x}\, dx + \int \frac{3\sqrt{x}}{x} dx$

$= \int x \cdot x^{1/2} dx + \frac{3x^{1/2}}{x} dx$

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

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

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

$= \frac{2}{5}x^{5/2} + 6x^{1/2} + C = \frac{2}{5}\sqrt{x^5} + 6\sqrt{x} + C$

6) $\int (x^{3/5} - x)\, dx$

$= \int x^{3/5} dx - \int x\, dx$

$= \frac{x^{3/5+1}}{3/5+1} - \frac{x^{1+1}}{1+1} + C = \frac{x^{8/5}}{8/5} - \frac{x^2}{2} + C$

$= \frac{5}{8}x^{8/5} - \frac{1}{2}x^2 + C$

7) $\int \frac{5}{x^2} dx$

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

$= \frac{5x^{-1}}{-1} + C = \frac{-5}{x} + C$

8) $\int \frac{x^3 + 2}{x} dx$

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

$= \frac{x^{2+1}}{2+1} + 2 \cdot \ln|x| + C$

$= \frac{1}{3}x^3 + 2\ln|x| + C$

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

$= \int 2x^5\,dx + \int 6x\,dx + \int 3x^2\,dx$

$= 2\int x^5\,dx + 6\int x\,dx + 3\int x^2\,dx$

$= \frac{2x^{5+1}}{5+1} + \frac{6x^{1+1}}{1+1} + \frac{3x^{2+1}}{2+1} = \frac{2x^6}{6} + \frac{6x^2}{2} + \frac{3x^3}{3}$

$= \frac{2}{6}x^6 + 3x^2 + x^3$

10) $\int \frac{\sqrt[3]{x^2} + \sqrt{x} + x}{x}\,dx =$

$= \int \frac{\sqrt[3]{x^2}}{x}\,dx + \int \frac{\sqrt{x}}{x}\,dx + \int \frac{x}{x}\,dx$

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

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

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

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

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