Francisco Javier Gómez Hernández

1:- $\int 12x^7\,dx$

- Desarrollo:

*Aplicando Formulas: $\int k\,dx$ y $\int x^n dx = \frac{x^{n+1}}{n+1} + c$

$= 12\int x^7 dx = \frac{12x^{7+1}}{7+1} = 12\frac{x^8}{8} + c = \frac{12}{8}x^8 + c$

*Resultado: $= \frac{3}{4}x^8 + c$

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

- Desarrollo:

*Aplicando Fórmulas: $\int (u \pm v \pm w)dx = \int u\,dx \pm \int v\,dx \pm \int w\,dx$, y $\int k\,dx = k\int dx = \int x^3 dx + \int 5x^2 dx - \int 2\,dx = \int x^3 dx + 5\int x^2 dx - 2\int dx$

*Aplicando Fórmulas: $\int x^n dx = \frac{x^{n+1}}{n+1} + c$ y $\int dx = x + c$

$= \frac{x^{3+1}}{3+1} + 5\frac{x^{2+1}}{2+1} - 2\int dx = \frac{x^4}{4} + 5\frac{x^3}{3} - 2x + c$

*Resultado: $\frac{x^4}{4} + \frac{5}{3}x^3 - 2x + c$

3:- $\int x^4(5 - x^2)\,dx$

- Desarrollo:

*Realizar Multiplicación:

$x^4(5 - x^2) = 5x^4 - x^6$

*Sustituir:

$\int (5x^4 - x^6)\,dx$

*Aplicando Fórmulas: $\int (u \pm v \pm w)\,dx = \int u\,dx \pm \int v\,dx \pm \int w\,dx$ y $\int k\,dx = k\int dx = \int 5x^4 dx - \int x^6 dx = 5\int x^4 dx - \int x^6 dx$

*Aplicando Fórmulas: $\int x^n dx = \frac{x^{n+1}}{n+1} + c$

$= 5\frac{x^{4+1}}{4+} - \frac{x^{6+1}}{6+1} + c = 5\frac{x^5}{5} - \frac{x^7}{7} + c$

*Resultado: $x^5 - \frac{x^7}{7} + c$

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4.- $\int \left(\sqrt{x} - \frac{1}{\sqrt{x}}\right) dx$

- Desarrollo

*Aplican Propiedades: $\sqrt[n]{a^m} = {}^{m/n}$ y $a^{\frac{1}{n}} = a^{-n}$

$= \int \left(x^{1/2} - \frac{1}{x^{1/2}}\right) dx = \int \left(x^{1/2} - x^{-1/2}\right) dx$

*Aplicar Fórmula: $\int (u \pm v \pm w)\, dx = \int u\,dx \pm \int v\,dx \pm \int w\,dx$

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

*Aplicar Fórmula: $\int x^n\,dx = \frac{x^{n+1}}{n+1} + C$

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

*Convertir a radicales: $a^{m/n} = \sqrt[n]{a^m}$

*Resultado: $\frac{2}{3}\sqrt{x^3} - 2\sqrt{x} + c$

5.- $\int (8x^4 + 4x^3 - 6x^2 + 5)\, dx$

- Desarrollo:

*Aplicar Fórmulas: $\int (u \pm v \pm w)\, dx = \int u\,dx \pm \int v\,dx \pm \int w\,dx \pm$

y $\int K\,dx = K\int dx$ $= \int 8x^4\,dx + \int 4x^3\,dx - \int 6x^2\,dx + \int 5\,dx$

$= 8\int x^4\,dx + 4\int x^3\,dx - 6\int x^2\,dx + 5\int dx$

*Aplicar Fórmulas: $\int x^n\,dx = \frac{x^{n+1}}{n+1} + C$

$= 8\frac{x^{4+1}}{4+1} + 4\frac{x^{3+1}}{3+1} - 6\frac{x^{2+1}}{2+1} + 5\int dx = 8\frac{x^5}{5} + 4\frac{x^4}{4} - 6\frac{x^3}{3} + 5x + C$

*Resultado: $= \frac{8x^5}{5} + x^4 - 2x^3 + 5x + C$

6.- $\int (4x^3 - 3x^2 - 6x - 1)\, dx$

- Desarrollo.

* Aplicar Fórmulas: $\int (u \pm v \pm w)\, dx = \int u\,dx = \int u\,dx \pm \int v\,dx \pm$

$\int w\,dx$ y $\int K\,dx = K\int dx$

$= \int 4x^3\,dx - \int 3x^2\,dx - \int 6x\,dx - \int dx$

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$= 4\int x^3 dx + 3\int x^2 dx - 6\int x dx - \int dx$

*Aplicar Fórmulas: $\int x^n dx = \frac{x^{n+1}}{n+1} + C$ y $\int dx = x + C$

$= 4\frac{x^{3+1}}{3+1} - 3\frac{x^{2+1}}{2+1} - 6\frac{x^{1+1}}{1+1} - \int dx = 4\frac{x^4}{4} - 3\frac{x^3}{3} - 6\frac{x^2}{2} - x + C$

*Resultado: $x^4 - x^3 - 3x^2 - x + C$

7.- $\int (3 - 2t + t^2) dt$

◦ Desarrollo:

*Aplicando Fórmulas: $\int (u \pm v \pm w) dx = \int u dx \pm \int v dx \pm \int w dx$ y $\int K dx = K\int dx$ $= \int 3 dt - \int 2t dt + \int t^2 dt = 3\int dt - 2\int t dt + \int t^2 dt$

*Aplicando Fórmulas: $\int x^n dx = \frac{x^{n+1}}{n+1} + C$ y $\int dx = x + C$

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

*Resultado: $3t - t^2 + \frac{t^3}{3} + C$