Francisco Javier Gómez Hernández

1: $\int \sqrt{x}\,dx$

- Desarrollo

* Aplicando $\sqrt[n]{a^m} = a^{m/n}$

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

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

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

* Convertir en radical

- Resultado $= \boxed{\frac{2}{3}\sqrt{x^3} + C}$

2: $\int \frac{2}{\sqrt{x^3}}\,dx$

- Desarrollo

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

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

* Aplicando Fórmula $\int k\,dx = k\int dx$

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

* Aplicando Fórmula $\int x^n dx = \frac{x^{n-1}}{n+1} + C$

$= 2\frac{x^{-3/2+2/2}}{-3/2+2/2} = 2\cdot\frac{x^{-1/2}}{-1/2} + C = 2(-2)x^{-1/2} + C = -4x^{-1/2} + C$

* Convertir en radical

$= -\frac{4}{x^{1/2}} + C$

- Resultado $= \boxed{-\frac{4}{\sqrt{x}} + C}$

3: $\int \frac{5}{\sqrt{x}}\,dx$

- Desarrollo

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

$= \int \frac{5}{x^{1/2}}\,dx = \int 5x^{1/2}\,dx$

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*Aplicando Fórmula: $\int k\,dx = k\int dx$

$= 5\int x^{-1/2}\,dx$

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

$= 5\,\frac{x^{-1/2+2/2}}{-1/2+2/2} = 5\,\frac{x^{1/2}}{1/2} + C = 5 \cdot 2\,x^{1/2} + C = 10x^{1/2} + C$

* Convertir en radical:

$\sqrt[n]{a^m} = a^{m/n}$

∘ Resultado: $= \boxed{10\sqrt{x} + C}$

4. $\int (2x^2 + 4x + 2)\,dx$

* Desarrollo:

*Aplicando Fórmulas: $\int (u \pm v \pm w)\,dx = \int u\,dx \pm \int v\,dx \pm \int w\,dx$ y $\int k\,dx = k\int dx$

$= \int 2x^2\,dx + \int 4x\,dx + \int 2\,dx = 2\int x^2\,dx + 4\int x\,dx + 2\int dx$

*Aplicando Fórmulas:

$\int x^n\,dx = \frac{x^{n+1}}{n+1} + C$ y $\int dx = x + C$

$= 2\,\frac{x^{2+1}}{2+1} + 4\,\frac{x^{1+1}}{1+1} + 2x = \frac{x^3}{3} + 4\,\frac{x^2}{2} + 2x + C = \frac{2x^3}{3} + \frac{4x^2}{2} + 2x + C$

∘ Resultado:

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

5. $\int 8\sqrt{x}\,dx$

∘ Desarrollo:

*Aplicando: $\sqrt[n]{a^m} = a^{m/n}$ y $\int k\,dx = k\int dx$

$= 8\int \sqrt{x}\,dx = 8\int x^{1/2}\,dx$

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

$= 8\,\frac{x^{1/2+2/2}}{1/2+2/2} = 8\,\frac{x^{3/2}}{3/2} + C = 8\,\frac{2}{3}\,x^{3/2} + C = \frac{16}{3}\,x^{3/2} + C$

* Convertir en radical

∘ Resultado: $\boxed{\frac{16}{3}\sqrt{x^3} + C}$

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6: $\int \frac{2}{5\sqrt{x^2}}\,dx$

- Desarrollo:

* Aplicando: $\sqrt[n]{a^m} = a^{m/n}$, $\frac{1}{a^n} = a^{-n}$ y $\int k\,dx = k\int dx$

$= \int \frac{2}{x^{2/5}}\,dx = \int 2x^{-2/5}\,dx = 2\int x^{-2/5}\,dx$

* Aplicando: $\int x^n\,dx$

$= 2\,\frac{x^{-2/5+5/5}}{-2/5+5/5} = 2\,\frac{x^{3/5}}{3/5} + C = 2\,\frac{5}{3}x^{3/5} + C = \frac{10}{3}x^{3/5}$

* Convertir a radical

- Resultado: $= \boxed{\frac{10}{3}\sqrt[5]{x^3} + C}$

7: $\int 4x^2\,dx$

- Desarrollo

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

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

- Resultado:

$= \boxed{4/3\,x^3 + C}$

8: $\int \frac{6}{\sqrt{x}}\,dx$

- Desarrollo

* Aplicando: $\sqrt[n]{a^m} = a^{m/n}$ $\frac{1}{a^n} = a^{-n}$ y $\int k\,dx = k\int dx$

$= 6\int \frac{d}{x^{1/2}} = 6\int x^{-1/2}\,dx$

* Aplicando: $\int x^n\,dx$

$= 6\,\frac{x^{-1/2+2/2}}{-1/2+2/2} = 6\,\frac{x^{1/2}}{1/2} + C = 6\cdot 2x^{1/2} + C = 12x^{1/2} + C$

* Convertir a radical

- Resultado: $\boxed{12\sqrt{x} + C}$

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9: $\int 4(2x^3+2x)\,dx$

- Desarrollo

* Realizar Multiplicación:

$4(2x^3+2x) = 4(2x^3)+4(2x) = 8x^3+8x$

* Sustitución e integral:

$\int(8x^3+8x)\,dx$

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

y $\int k\,dx = k\int dx$

$= \int 8x^3\,dx + \int 8x\,dx = 8\int x^3\,dx + 8\int x\,dx$

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

$= 8\frac{x^{3+1}}{3+1} + 8\frac{x^{1+1}}{1+1} = 8\frac{x^4}{4} + \frac{x^2}{2} + C = \frac{8x^4}{4} + \frac{8x^2}{2} + C$

- Resultado

$= \boxed{2x^4+4x^2+C}$

10: $\int \sqrt{x^5}\,dx$

- Desarrollo:

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

$= \int x^{5/2}\,dx$

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

$= \frac{x^{5/2+2/2}}{5/2+2/2} = \frac{x^{7/2}}{7/2} + C = \frac{2}{7}x^{7/2} + C$

- Resultado:

$\boxed{2/7\sqrt{x^7} + C}$