

Gerardo Martin Hidalgo

$$\textcircled{1} \int (2x^2 - 5x + 3)^3 dx$$

$$(2x^2 - 5x + 3)(2x^2 - 5x + 3)(2x^2 - 5x + 3)$$

$$4x^4 - 10x^3 + 6x^2$$

$$-10x^3 + 23x^2 - 15x$$

$$6x^2 - 15x + 9$$

$$(4x^4 - 20x^3 + 47x^2 - 30x + 9)(2x^2 - 5x + 3)$$

$$8x^6 - 40x^5 + 94x^4 - 60x^3 + 18x^2$$

$$-20x^5 + 100x^4 - 135x^3 + 150x^2 - 45x$$

$$12x^4 - 60x^3 + 141x^2 - 90x + 27$$

$$8 \int x^6 dx - 60 \int x^5 dx + 20 \int x^4 dx - 355 \int x^3 dx + 309 \int x^2 dx + 135 \int x dx + 27 \int dx$$

$$\frac{8}{7} x^7 - \frac{60}{6} x^6 + \frac{20}{5} x^5 - \frac{355}{4} x^4 + \frac{309}{3} x^3 - \frac{135}{2} x^2 + 27x + C$$

$$\textcircled{2} \int (x^3 + 5x^2 - 4) dx = \int \left(\frac{x^3}{x^2} + \frac{5x^2}{x^2} - \frac{4}{x^2} - \frac{4}{x^2} \right) dx$$

$$= \int \left(x + 5 - \frac{4}{x^2} \right) dx = \int x dx + 5 \int dx - 4 \int x^{-2} dx$$

$$= \frac{x}{2} + 5x - \frac{4}{-1} x^{-1} = \frac{x^2}{2} + 5x + \frac{4}{x} + C$$

$$\textcircled{3} \int \frac{x^2 dx}{x^5 + 2} = \int x^2 (x^3 + 2)^{-1/4} dx =$$

$$= \frac{1}{4} \int (x^4 + 2x) dx$$

$$\frac{1}{4} \int x^4 dx + \frac{1}{4} \int (2x) dx = \frac{1}{4} \frac{x^5}{5} + \frac{1}{4} \frac{2x^2}{2} + C$$

$$\frac{x^5}{20} + \frac{1}{4} x^2 + C$$

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$$\textcircled{4} \int \sqrt[3]{(x-2)} x dx = \int (x-x^3)^{1/3} x dx = \int (x-x^3)^{1/3} dx \\ = \frac{x-x^3}{4/3} = \frac{3}{4} (x-x^3)^{4/3} = \boxed{\frac{3}{4} \sqrt[4]{(x-2)^4} + C}$$

$$\textcircled{5} \int \frac{(1+x^2)}{\sqrt{x}} dx = \int \frac{(1+2x+x^2)}{\sqrt{x}} dx = \int (1+2x+x^2)x^{-1/2} dx \\ \int x^{1/2} dx + 2 \int x^{-1/2} dx + \int x^{3/2} dx = x^{3/2} + 4x^{1/2} + \frac{2}{5} x^{5/2} + C \\ = \boxed{\sqrt{x^3} + \frac{4}{\sqrt{x}} + \frac{2}{5} x^{5/2} + C}$$

$$\textcircled{6} \int \frac{\sqrt{x}}{x^2} dx = \int \sqrt{x} x^{-2} dx = \int x^{1/2} x^{-2} dx = \int x^{-3/2} dx \\ = \frac{x^{-1/2}}{-1/2} + C = \boxed{-\frac{2}{\sqrt{x}} + C}$$

$$\textcircled{7} \int \frac{2x^3}{\sqrt{x^5}} dx = \int 2x^3 (x^{-5/2}) dx = 2 \int x^{1/2} dx = \\ = \frac{2x^{3/2}}{3/2} + C = \frac{4}{3} x^{3/2} + C = \boxed{\frac{4}{3} \sqrt{x^3} + C}$$

$$\textcircled{9} \frac{dx}{x^2 + 10x^{-1} + 30} = \int (7x^2 + 10x^{-1} + \frac{1}{30}) dx \\ = \int 7x^2 dx + 10 \int x^{-1} dx + \frac{1}{30} \int dx = \frac{7x^3}{3} + 10 \ln|x| + \frac{x}{30} + C \\ = \boxed{\frac{7x^3}{3} + 10 \ln|x| + \frac{x}{30} + C}$$

$$\textcircled{10} \int \frac{dx}{4x^2 - 16} = \frac{1}{2(3x)} \ln \left| \frac{4+3x}{4-3x} \right| + C$$

$$\textcircled{8} \int \frac{dx}{4x^2 + 9} = \frac{1}{3} \text{ARCTAN} \frac{2x}{3} + C$$