Pág 331, 4 h y j

$$h)\quad \int \frac{dx}{\sqrt{25-9x^2}} = \int \frac{\frac{dx}{5}}{\frac{\sqrt{25-9x^2}}{5}} = \int \frac{\frac{dx}{5}}{\sqrt{\frac{25-9x^2}{25}}} = \int \frac{\frac{dx}{5}}{\sqrt{1-\frac{9x^2}{25}}} =$$

$$= \int \frac{\frac{dx}{5}}{\sqrt{1-\left(\frac{3x}{5}\right)^2}} = \left\{ \begin{array}{l} t = \frac{3x}{5} \\ dt = \frac{3}{5}dx \rightarrow \quad \frac{dt}{3} = \frac{dx}{5} \end{array} \right\} = \int \frac{\frac{dt}{3}}{\sqrt{1-t^2}} = \frac{1}{3}\int \frac{dt}{\sqrt{1-t^2}} =$$

$$= \frac{1}{3}\, arcsen\, t + C = \frac{1}{3}\, arcsen\left(\frac{3x}{5}\right) + C$$

$$j)\quad \int e^{5x-2}\, dx = \left\{ \begin{array}{l} t = 5x-2 \\ dt = 5\, dx \rightarrow \quad \frac{dt}{5} = dx \end{array} \right\} = \int e^t \frac{dt}{5} = \frac{1}{5}\int e^t dt = \frac{1}{5}\; e^t + C = \frac{1}{5}\, e^{5x-2} + C$$

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$$R1)\quad \int x\sqrt{x+5}dx = \left\{ \begin{array}{l} t^2 = x+5 \quad \rightarrow \quad x = t^2 - 5 \\ 2\,t\,dt = 1\,dx \quad \rightarrow \quad dx = 2\,t\,dt \end{array} \right\} = \int \left(t^2-5\right)\sqrt{t^2}\; 2\,t\,dt =$$

$$\left(t^2-5\right)\sqrt{t^2}\; 2\,t = \left(t^2-5\right)t\; 2\,t = 2\,t^4 - 10\,t^2$$

$$= \int \left(2\,t^4 - 10\,t^2\right)dt = 2\,\frac{t^5}{5} - 10\frac{t^3}{3} + C = \frac{2}{5}\,t^5 - \frac{10}{3}\,t^3 + C =$$

$$= \frac{2}{5}\sqrt{(x+5)^5} - \frac{10}{3}\sqrt{(x+5)^3} + C$$

$$R2)\quad \int \frac{dx}{\sqrt{x}+\sqrt[3]{x}} = \left\{ \begin{array}{l} t^6 = x \\ 6\,t^5\,dt = dx \end{array} \right\} = \int \frac{6\,t^5\,dt}{\sqrt{t^6}+\sqrt[3]{t^6}} = \int \frac{6\,t^5\,dt}{t^3+t^2} = \int \frac{6\,t^3\,dt}{t+1} =$$

$$= 6\int \frac{t^3\,dt}{t+1} = \quad (continua\ en\ *)$$

Calculemos la división polinómica,

t^3				$t+1$
$-t^3$	$-t^2$			t^2-t+1
0	t^2	$+t$		
	0	t		
		$-t$	-1	
		0	$\boxed{-1}$	

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

$$(*) = 6\int \frac{t^3\,dt}{t+1} = 6\int\left(t^2 - t + 1 + \frac{-1}{t+1}\right)dt = 6\left[\frac{t^3}{3} - \frac{t^2}{2} + t - \int\frac{dt}{t+1}\right] =$$

$$= 6\left[\frac{t^3}{3} - \frac{t^2}{2} + t - Ln|t+1|\right] + C = 2t^3 - 3t^2 + 6t - 6Ln|t+1| + C =$$

$$Deshacemos\ el\ cambio:\ t^6 = x \quad \to \quad t = \sqrt[6]{x} \quad \to \quad \begin{cases} t^3 = \left(\sqrt[6]{x}\right)^3 = \sqrt{x} \\ t^2 = \left(\sqrt[6]{x}\right)^2 = \sqrt[3]{x} \end{cases}$$

$$= 2\sqrt{x} - 3\sqrt[3]{x} + 6\sqrt[6]{x} - 6Ln\left|\sqrt[6]{x} + 1\right| + C$$