Resuelve las siguientes integrales indefinidas:

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

$$I(x) = 2\cdot\int x^3\, dx + 3\cdot\int x\, dx - 5\cdot\int 1\cdot dx = 2\cdot\frac{x^4}{4} + 3\cdot\frac{x^2}{2} - 5\cdot x + C$$

2.- $\int \frac{1}{x^4}\, dx \Rightarrow \quad I(x) = \int x^{-4}\, dx$

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

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

$$I(x) = \frac{x^{\frac{5}{3}}}{\frac{5}{3}} + C = \frac{3}{5}\cdot x^{\frac{5}{3}} + C$$

4.- $\int \frac{1}{\sqrt[3]{x}}\, dx \Rightarrow \quad I(x) = \int x^{-\frac{1}{3}}\, dx$

$$I(x) = \frac{x^{\frac{2}{3}}}{\frac{2}{3}} + C = \frac{3}{2}\cdot x^{\frac{2}{3}} + C$$

5.- $\int \text{sen}^3 x \cos x\, dx$

$$I(x) = \frac{\text{sen}^4 x}{4} + C$$

6.- $\int \text{tg}^2 x \sec^2 x\, dx$

$$I(x) = \frac{\text{tg}^3 x}{3} + C$$

7.- $\int \left(\text{tg}^3 x + \text{tg}^5 x\right) dx \Rightarrow \quad I(x) = \int \text{tg}^3 x \cdot \left(1 + \text{tg}^2 x\right) dx$

$$I(x) = \frac{\text{tg}^4 x}{4} + C$$

8.- $\int \text{sen}^3 x\, dx$

$$I(x) = \int \text{sen}\, x \cdot \text{sen}^2 x\, dx = \int \text{sen}\, x \cdot \left(1 - \cos^2 x\right) dx = \int \text{sen}\, x\, dx - \int \cos^2 x \cdot \text{sen}\, x\, dx =$$

$$= \int \text{sen}\, x\, dx + \int \cos^2 x \cdot (-\text{sen}\, x)\, dx = -\cos x + \frac{\cos^3 x}{3} + C$$

9.- $\int \frac{3x^2+1}{x^3+x+5}\,dx$

$I(x) = \ln\left(x^3+x+5\right) + C$

10.- $\int \frac{x^2}{x^3+8}\,dx$

$I(x) = \frac{1}{3}\cdot\int \frac{3\cdot x^2}{x^3+8}\,dx = \frac{1}{3}\cdot\ln\left(x^3+8\right) + C$

11.- $\int x\, e^{x^2}\,dx$

$I(x) = \frac{1}{2}\cdot\int e^{x^2}\cdot 2x\,dx = \frac{1}{2}\cdot e^{x^2} + C$

12.- $\int e^{\operatorname{sen} x}\cos x\,dx$

$I(x) = e^{\operatorname{sen}x} + C$

13.- $\int e^{2x+1}\,dx$

$I(x) = \frac{1}{2}\cdot\int e^{2x+1}\cdot 2\,dx = \frac{1}{2}\cdot e^{2x+1} + C$

14.- $\int 8^{2x+1}\,dx$

$I(x) = \frac{1}{2\cdot\ln(8)}\cdot\int 8^{2x+1}\cdot 2\cdot\ln(8)\,dx = \frac{1}{2\cdot\ln(8)}\cdot 8^{2x+1} + C$

15.- $\int e^x\cos e^x\,dx$

$I(x) = \operatorname{sen} e^x + C$

16.- $\int x^2\cos(x^3+9)\,dx$

$I(x) = \frac{1}{3}\cdot\int \cos\left(x^3+9\right)\cdot 3x^2\,dx = \frac{1}{3}\cdot\operatorname{sen}\left(x^3+9\right) + C$

17.- $\int x\cos(x^2+1)\,dx$

$I(x) = \frac{1}{2}\cdot\int \cos\left(x^2+1\right)\cdot 2x\,dx = \frac{1}{2}\cdot\operatorname{sen}\left(x^2+1\right) + C$

18.- $\int \frac{1}{\cos^2(2x+1)}\,dx$

$I(x) = \frac{1}{2}\cdot\int \frac{2}{\cos^2(2x+1)}\,dx = \frac{1}{2}\cdot\operatorname{tg}(2x+1) + C$

19.- $\int \operatorname{tg}^2 x\,dx$

$I(x) = \int\left[\left(\operatorname{tg}^2 x+1\right)-1\right]dx = \int\left(\operatorname{tg}^2 x+1\right)dx - \int 1\,dx = \operatorname{tg}x - x + C$

$$I(x)=\int \frac{sen^2 x}{cos^2 x}\,dx=\int \frac{1-cos^2 x}{cos^2 x}\,dx=\int \frac{1}{cos^2 x}\,dx-\int 1\,dx = tgx - x + C$$

20.- $\int \frac{x}{\sqrt{1-x^4}}\,dx$

$$I(x)=\int \frac{x}{\sqrt{1-\left(x^2\right)^2}}\,dx=\frac{1}{2}\cdot\int \frac{2\,x}{\sqrt{1-\left(x^2\right)^2}}\,dx=\frac{1}{2}\cdot arcsen\ x^2+C$$

21.- $\int \frac{\cos x}{1+sen^2 x}\,dx$

$$I(x)=\int \frac{\cos x}{1+(sen\,x)^2}\,dx = arctg(sen\,x)+C$$

22.- $\int \frac{x^2}{1+x^6}\,dx$

$$I(x)=\int \frac{x^2}{1+\left(x^3\right)^2}\,dx=\frac{1}{3}\cdot\int \frac{3\,x^2}{1+\left(x^3\right)^2}\,dx=\frac{1}{3}\cdot arctg\left(x^3\right)+C$$

23.- $\int \frac{1+2x}{1+x^2}\,dx$

$$I(x)=\int \frac{1}{1+x^2}\,dx+\int \frac{2x}{1+x^2}\,dx = arctg\,x+\ln\left(1+x^2\right)+C$$

24.- $\int \frac{x-1}{x^2-2x-6}\,dx$

$$I(x)=\frac{1}{2}\cdot\int \frac{2\cdot(x-1)}{x^2-2x-6}\,dx=\frac{1}{2}\cdot\int \frac{2x-2}{x^2-2x-6}\,dx=\frac{1}{2}\cdot\ln\left(x^2-2x-6\right)+C$$

25.- $\int \frac{x^2+1}{x-1}\,dx$

$$\begin{array}{r|l} x^2+1 & x-1 \\ \hline -x^2+x & x+1 \\ x+1 & \\ -x+1 & \\ 2 & \end{array}$$

$$I(x)=\int \left(x+1+\frac{2}{x-1}\right)dx=\frac{x^2}{2}+x+2\cdot\ln(x-1)+C$$

26.- $\int \frac{x^3+1}{x^2-5x+4}\,dx$

$$\begin{array}{r|l} x^3+1 & x^2-5x+4 \\ \hline -x^3+5x^2-4x & x+5 \\ 5x^2-4x+1 & \\ -5x^2+25x-20 & \\ 21x-19 & \end{array}$$

$$I(x)=\int \left(x+5+\frac{21x-19}{x^2-5x+4}\right)dx=\frac{x^2}{2}+5x+I_1(x)+C$$

$I_1(x)=\int \frac{21x-19}{x^2-5x+4}\,dx$ **Se resuelve por descomposición en fracciones simples.**

27.- $\int \frac{\operatorname{sen} x + \operatorname{tg} x}{\cos x}\,dx$

$$I(x)=\int \frac{\operatorname{sen}x}{\cos x}\,dx+\int \frac{\operatorname{sen}x}{\cos^2 x}\,dx=-\int \frac{-\operatorname{sen}x}{\cos x}\,dx-\int \cos^{-2}x\cdot(-\operatorname{sen}x)\,dx=-\ln(\cos x)-\frac{\cos^{-1}x}{-1}+C=$$

$$=\ln\left(\frac{1}{\cos x}\right)+\frac{1}{\cos x}+C$$

28.- $\int \frac{(Lx)^3}{x}\,dx$

$$I(x)=\int (\ln x)^3\cdot\frac{1}{x}\,dx=\frac{(\ln x)^4}{4}+C$$

29.- $\int \frac{1}{x\sqrt{1-L^2 x}}\,dx$

$$I(x)=\int \frac{\frac{1}{x}}{\sqrt{1-(\ln x)^2}}\,dx=\operatorname{arcsen}(\ln x)+C$$