FORMULAS

1. $\int \sin x\,dx = -\cos x + C$
2. $\int \cos x\,dx = \sin x + C$
3. $\int \sec^2 x\,dx = \tan x + C$
4. $\int \sec x \tan x\,dx = \sec x + C$
5. $\int \csc^2 x\,dx = -\cot x + C$
6. $\int \csc x \cot x\,dx = -\csc x + C$
7. $\int e^x\,dx = e^x + C$

8. $\int (\theta^3 - \csc^2\theta)\,d\theta$

$= \frac{\theta^{3+1}}{3+1} - (-\cot\theta) + C$

$= \frac{1}{4}\theta^4 + \cot\theta + C$

9. $\int (5x^2 - 4e^x)\,dx$

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

$= 5 \cdot \frac{x^3}{3} - 4e^x + C$

$= \frac{5}{3}x^3 - 4e^x + C$

10. $\int \frac{1}{\cos^2 x}\,dx$

$\sec x = \frac{1}{\cos x}$

$= \int \sec^2 x\,dx$

$= \tan x + C$

RECALL

$\sin^2 + \cos^2 = 1$

$\cos^2 = 1 - \sin^2$

11. $\int \frac{\sin x}{1 - \sin^2 x}\,dx$

$= \int \frac{\sin x}{\cos^2 x}\,dx$

$= \int \frac{\sin x}{\cos x \cos x}\,dx$

$= \int \frac{\sin x}{\cos x} \cdot \frac{1}{\cos x}\,dx$

$= \int \tan x \cdot \sec x\,dx$

$= \sec x + C$

RECALL

$\tan x = \frac{\sin x}{\cos x}$

$\sec x = \frac{1}{\cos x}$

NOTE

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

12. $\int (\sin x + 5^x)\,dx$

$= -\cos x + \left(\frac{1}{\ln 5}\right)5^x + C$

NOTE

$$\int \frac{1}{x}\,dx = \ln|x| + C$$

13. $\int \left(\frac{5}{x} + \csc^2 x\right)dx$

$= 5 \cdot \ln|x| - \cot x + C$