Useful identities

1. $\displaystyle\int x^n\,dx = \frac{1}{n+1}x^{n+1} + C \quad (n \neq -1)$
2. $\displaystyle\int \frac{1}{x}\,dx = \ln|x| + C$
3. $\displaystyle\int \sin x\,dx = -\cos x + C$
4. $\displaystyle\int \cos x\,dx = \sin x + C$
5. $\displaystyle\int \sec^2 x\,dx = \tan x + C$
6. $\displaystyle\int \csc^2 x\,dx = -\cot x + C$
7. $\displaystyle\int \csc x \cot x\,dx = -\csc x + C$
8. $\displaystyle\int \sec x \tan x\,dx = \sec x + C$
9. $\displaystyle\int e^x\,dx = e^x + C$
10. $\displaystyle\int \tan x\,dx = -\ln|\cos x| + C$
11. $\displaystyle\int \cot x\,dx = \ln|\sin x| + C$
12. $\displaystyle\int \sec x\,dx = \ln|\sec x + \tan x| + C$
13. $\displaystyle\int \csc x\,dx = -\ln|\csc x + \cot x| + C$
14. $\displaystyle\int \frac{1}{a^2+x^2}\,dx = \frac{1}{a}\tan^{-1}\left(\frac{x}{a}\right) + C$
15. $\displaystyle\int \frac{1}{\sqrt{a^2-x^2}}\,dx = \sin^{-1}\left(\frac{x}{a}\right) + C$
16. $\displaystyle\int \frac{1}{x\sqrt{x^2-a^2}}\,dx = \frac{1}{a}\sec^{-1}\left(\frac{|x|}{a}\right) + C$
17. $\displaystyle\int \sec^3 x\,dx = \frac{1}{2}\left(\sec x \tan x + \ln|\sec x + \tan x|\right) + C$
18. $\sin(2x) = 2\sin x \cos x$
19. $\cos(2x) = \cos^2 x - \sin^2 x = 1 - 2\sin^2 x = 2\cos^2 x - 1$
20. $\displaystyle\cos^2 x = \frac{1+\cos(2x)}{2}$
21. $\displaystyle\sin^2 x = \frac{1-\cos(2x)}{2}$