Integrals

You are expected to have the following facts memorized.

1. $\displaystyle\int x^n \, dx = \frac{x^{n+1}}{n+1} + C, \ (n \neq -1)$

2. $\displaystyle\int \frac{1}{x} \, dx = \ln x + C$

3. $\displaystyle\int e^x \, dx = e^x + C$

4. $\displaystyle\int a^x \, dx = a^x \frac{1}{\ln a} + C$

5. $\displaystyle\int \sin x \, dx = -\cos x + C,$ $\qquad$ $\displaystyle\int \cos x \, dx = \sin x + C$

6. $\displaystyle\int \tan x \, dx = \ln|\sec x| + C,$ $\qquad$ $\displaystyle\int \cot x \, dx = -\ln|\csc x| + C$

7. $\displaystyle\int \sec x \, dx = \ln|\sec x + \tan x| + C,$ $\qquad$ $\displaystyle\int \csc x \, dx = -\ln|\csc x + \cot x| + C$

8. $\displaystyle\int \sec^2 x \, dx = \tan x + C,$ $\qquad$ $\displaystyle\int \csc^2 x \, dx = -\cot x + C$

9. $\displaystyle\int \sec x \tan x \, dx = \sec x + C,$ $\qquad$ $\displaystyle\int \csc x \cot x \, dx = -\csc x + C$

10. $\displaystyle\int \frac{1}{\sqrt{1-x^2}} \, dx = \sin^{-1} x + C$

11. $\displaystyle\int \frac{1}{1+x^2} \, dx = \tan^{-1} x + C$

12. $\displaystyle\int \frac{1}{a^2+x^2} \, dx = \frac{1}{a} \tan^{-1} \frac{x}{a} + C$

13. $\displaystyle\int \frac{1}{|x|\sqrt{x^2-1}} \, dx = \sec^{-1} x + C$

14. $\int \sinh x \, dx = \cosh x + C, \qquad \int \cosh x \, dx = \sinh x + C$