

Chapter 15

Indefinite Integration



Table 15-1: Constant of integration illustrated

| Function $f(x)$ | Derivative $\frac{dy}{dx}$ | | Function $f(x)$ | Derivative $\frac{dy}{dx}$ |
|------------------------|----------------------------|--|------------------------|----------------------------|
| $y_1 = 3x^2 - 5x + 17$ | $6x - 5$ | | $y_2 = 3x^2 - 5x + 8$ | $6x - 5$ |
| $y_3 = 3x^2 - 5x$ | $6x - 5$ | | $y_4 = 3x^2 - 5x - 20$ | $6x - 5$ |

Table 15-2: Standard integrals

| y | $\int y \cdot dx$ | y | $\int y \cdot dx$ |
|---------------------------------|---|-----------------------------------|---|
| $\sec x$ | $\ln \tan x + \sec x + C$ | $\sec ax$ | $\frac{\ln \tan ax + \sec ax }{a} + C$ |
| $\operatorname{cosec} x$ | $-\ln \cot x + \operatorname{cosec} x + C$ | $\operatorname{cosec} ax$ | $-\frac{\ln \cot ax + \operatorname{cosec} ax }{a} + C$ |
| $\cot x$ | $\ln \sin x + C$ | $\cot ax$ | $\frac{\ln \sin ax }{a} + C$ |
| $\sec^2 x$ | $\tan x + C$ | $\sec^2 ax$ | $\frac{\tan ax}{a} + C$ |
| $\operatorname{cosec}^2 x$ | $-\cot x + C$ | $\operatorname{cosec}^2 ax$ | $-\frac{1}{a}\cot ax + C$ |
| $\sec x \tan x$ | $\sec x + C$ | $\sec ax \tan ax$ | $\frac{1}{a}\sec ax + C$ |
| $\operatorname{cosec} x \cot x$ | $-\operatorname{cosec} x + C$ | $\operatorname{cosec} ax \cot ax$ | $-\frac{1}{a}\operatorname{cosec} ax + C$ |
| $\frac{1}{\sqrt{1-x^2}}$ | $\sin^{-1} x + C$ | $\frac{-1}{x\sqrt{x^2-1}}$ | $\operatorname{cosec}^{-1} x + C$ |
| $\frac{-1}{\sqrt{1-x^2}}$ | $\cos^{-1} x + C$ | $\frac{1}{x\sqrt{x^2-1}}$ | $\sec^{-1} x + C$ |
| $\frac{1}{1+x^2}$ | $\tan^{-1} x + C$ | $\frac{-1}{1+x^2}$ | $\cot^{-1} x + C$ |



Thank You