

## 9.7 Reduction Formulas

$$1018. \int x^n e^{mx} dx = \frac{1}{m} x^n e^{mx} - \frac{n}{m} \int x^{n-1} e^{mx} dx$$

$$1019. \int \frac{e^{mx}}{x^n} dx = -\frac{e^{mx}}{(n-1)x^{n-1}} + \frac{m}{n-1} \int \frac{e^{mx}}{x^{n-1}} dx, \quad n \neq 1.$$

$$1020. \int \sinh^n x dx = \frac{1}{n} \sinh^{n-1} x \cosh x - \frac{n-1}{n} \int \sinh^{n-2} x dx$$

$$1021. \int \frac{dx}{\sinh^n x} = -\frac{\cosh x}{(n-1)\sinh^{n-1} x} - \frac{n-2}{n-1} \int \frac{dx}{\sinh^{n-2} x}, \quad n \neq 1.$$

$$1022. \int \cosh^n x dx = \frac{1}{n} \sinh x \cosh^{n-1} x \cosh x + \frac{n-1}{n} \int \cosh^{n-2} x dx$$

$$1023. \int \frac{dx}{\cosh^n x} = -\frac{\sinh x}{(n-1)\cosh^{n-1} x} + \frac{n-2}{n-1} \int \frac{dx}{\cosh^{n-2} x}, \quad n \neq 1.$$

$$1024. \int \sinh^n x \cosh^m x dx = \frac{\sinh^{n+1} x \cosh^{m-1} x}{n+m} \\ + \frac{m-1}{n+m} \int \sinh^n x \cosh^{m-2} x dx$$

$$1025. \int \sinh^n x \cosh^m x dx = \frac{\sinh^{n-1} x \cosh^{m+1} x}{n+m} \\ - \frac{n-1}{n+m} \int \sinh^{n-2} x \cosh^m x dx$$

$$1026. \int \tanh^n x dx = -\frac{1}{n-1} \tanh^{n-1} x + \int \tanh^{n-2} x dx, \quad n \neq 1.$$

$$1027. \int \coth^n x dx = -\frac{1}{n-1} \coth^{n-1} x + \int \coth^{n-2} x dx, \quad n \neq 1.$$

$$1028. \int \operatorname{sech}^n x dx = \frac{\operatorname{sech}^{n-2} x \tanh x}{n-1} + \frac{n-2}{n-1} \int \operatorname{sech}^{n-2} x dx, \quad n \neq 1.$$

$$1029. \int \sin^n x dx = -\frac{1}{n} \sin^{n-1} x \cos x + \frac{n-1}{n} \int \sin^{n-2} x dx$$

$$1030. \int \frac{dx}{\sin^n x} = -\frac{\cos x}{(n-1)\sin^{n-1} x} + \frac{n-2}{n-1} \int \frac{dx}{\sin^{n-2} x}, \quad n \neq 1.$$

$$1031. \int \cos^n x dx = \frac{1}{n} \sin x \cos^{n-1} x + \frac{n-1}{n} \int \cos^{n-2} x dx$$

$$1032. \int \frac{dx}{\cos^n x} = \frac{\sin x}{(n-1)\cos^{n-1} x} + \frac{n-2}{n-1} \int \frac{dx}{\cos^{n-2} x}, \quad n \neq 1.$$

$$1033. \int \sin^n x \cos^m x dx = \frac{\sin^{n+1} x \cos^{m-1} x}{n+m} \\ + \frac{m-1}{n+m} \int \sin^n x \cos^{m-2} x dx$$

$$1034. \int \sin^n x \cos^m x dx = -\frac{\sin^{n-1} x \cos^{m+1} x}{n+m} \\ + \frac{n-1}{n+m} \int \sin^{n-2} x \cos^m x dx$$

$$1035. \int \tan^n x dx = \frac{1}{n-1} \tan^{n-1} x - \int \tan^{n-2} x dx, \quad n \neq 1.$$

$$1036. \int \cot^n x dx = -\frac{1}{n-1} \cot^{n-1} x - \int \cot^{n-2} x dx, \quad n \neq 1.$$

$$1037. \int \sec^n x dx = \frac{\sec^{n-2} x \tan x}{n-1} + \frac{n-2}{n-1} \int \sec^{n-2} x dx, n \neq 1.$$

$$1038. \int \csc^n x dx = -\frac{\csc^{n-2} x \cot x}{n-1} + \frac{n-2}{n-1} \int \csc^{n-2} x dx, n \neq 1.$$

$$1039. \int x^n \ln^m x dx = \frac{x^{n+1} \ln^m x}{n+1} - \frac{m}{n+1} \int x^n \ln^{m-1} x dx$$

$$1040. \int \frac{\ln^m x}{x^n} dx = -\frac{\ln^m x}{(n-1)x^{n-1}} + \frac{m}{n-1} \int \frac{\ln^{m-1} x}{x^n} dx, n \neq 1.$$

$$1041. \int \ln^n x dx = x \ln^n x - n \int \ln^{n-1} x dx$$

$$1042. \int x^n \sinh x dx = x^n \cosh x - n \int x^{n-1} \cosh x dx$$

$$1043. \int x^n \cosh x dx = x^n \sinh x - n \int x^{n-1} \sinh x dx$$

$$1044. \int x^n \sin x dx = -x^n \cos x + n \int x^{n-1} \cos x dx$$

$$1045. \int x^n \cos x dx = x^n \sin x - n \int x^{n-1} \sin x dx$$

$$1046. \int x^n \sin^{-1} x dx = \frac{x^{n+1}}{n+1} \sin^{-1} x - \frac{1}{n+1} \int \frac{x^{n+1}}{\sqrt{1-x^2}} dx$$

$$1047. \int x^n \cos^{-1} x dx = \frac{x^{n+1}}{n+1} \cos^{-1} x + \frac{1}{n+1} \int \frac{x^{n+1}}{\sqrt{1-x^2}} dx$$

$$1048. \int x^n \tan^{-1} x dx = \frac{x^{n+1}}{n+1} \tan^{-1} x - \frac{1}{n+1} \int \frac{x^{n+1}}{1+x^2} dx$$

$$1049. \int \frac{x^n dx}{ax^n + b} = \frac{x}{a} - \frac{b}{a} \int \frac{dx}{ax^n + b}$$

$$1050. \int \frac{dx}{(ax^2 + bx + c)^n} = \frac{-2ax - b}{(n-1)(b^2 - 4ac)(ax^2 + bx + c)^{n-1}} \\ - \frac{2(2n-3)a}{(n-1)(b^2 - 4ac)} \int \frac{dx}{(ax^2 + bx + c)^{n-1}}, \quad n \neq 1.$$

$$1051. \int \frac{dx}{(x^2 + a^2)^n} = \frac{x}{2(n-1)a^2(x^2 + a^2)^{n-1}} + \frac{2n-3}{2(n-1)a^2} \int \frac{dx}{(x^2 + a^2)^{n-1}}, \\ n \neq 1.$$

$$1052. \int \frac{dx}{(x^2 - a^2)^n} = -\frac{x}{2(n-1)a^2(x^2 - a^2)^{n-1}} \\ - \frac{2n-3}{2(n-1)a^2} \int \frac{dx}{(x^2 - a^2)^{n-1}}, \quad n \neq 1.$$