

9.2 Integrals of Rational Functions

$$876. \int a dx = ax + C$$

$$877. \int x dx = \frac{x^2}{2} + C$$

$$878. \int x^2 dx = \frac{x^3}{3} + C$$

$$879. \int x^p dx = \frac{x^{p+1}}{p+1} + C, p \neq -1.$$

$$880. \int (ax + b)^n dx = \frac{(ax + b)^{n+1}}{a(n+1)} + C, n \neq -1.$$

$$881. \int \frac{dx}{x} = \ln|x| + C$$

$$882. \int \frac{dx}{ax + b} = \frac{1}{a} \ln|ax + b| + C$$

$$883. \int \frac{ax + b}{cx + d} dx = \frac{a}{c}x + \frac{bc - ad}{c^2} \ln|cx + d| + C$$

$$884. \int \frac{dx}{(x + a)(x + b)} = \frac{1}{a - b} \ln \left| \frac{x + b}{x + a} \right| + C, a \neq b.$$

$$885. \int \frac{xdx}{a + bx} = \frac{1}{b^2} (a + bx - a \ln|a + bx|) + C$$

$$886. \int \frac{x^2 dx}{a+bx} = \frac{1}{b^3} \left[\frac{1}{2}(a+bx)^2 - 2a(a+bx) + a^2 \ln|a+bx| \right] + C$$

$$887. \int \frac{dx}{x(a+bx)} = \frac{1}{a} \ln \left| \frac{a+bx}{x} \right| + C$$

$$888. \int \frac{dx}{x^2(a+bx)} = -\frac{1}{ax} + \frac{b}{a^2} \ln \left| \frac{a+bx}{x} \right| + C$$

$$889. \int \frac{xdx}{(a+bx)^2} = \frac{1}{b^2} \left(\ln|a+bx| + \frac{a}{a+bx} \right) + C$$

$$890. \int \frac{x^2 dx}{(a+bx)^2} = \frac{1}{b^3} \left(a+bx - 2a \ln|a+bx| - \frac{a^2}{a+bx} \right) + C$$

$$891. \int \frac{dx}{x(a+bx)^2} = \frac{1}{a(a+bx)} + \frac{1}{a^2} \ln \left| \frac{a+bx}{x} \right| + C$$

$$892. \int \frac{dx}{x^2-1} = \frac{1}{2} \ln \left| \frac{x-1}{x+1} \right| + C$$

$$893. \int \frac{dx}{1-x^2} = \frac{1}{2} \ln \left| \frac{1+x}{1-x} \right| + C$$

$$894. \int \frac{dx}{a^2-x^2} = \frac{1}{2a} \ln \left| \frac{a+x}{a-x} \right| + C$$

$$895. \int \frac{dx}{x^2-a^2} = \frac{1}{2a} \ln \left| \frac{x-a}{x+a} \right| + C$$

$$896. \int \frac{dx}{1+x^2} = \tan^{-1} x + C$$

$$897. \int \frac{dx}{a^2 + x^2} = \frac{1}{a} \tan^{-1} \frac{x}{a} + C$$

$$898. \int \frac{xdx}{x^2 + a^2} = \frac{1}{2} \ln(x^2 + a^2) + C$$

$$899. \int \frac{dx}{a + bx^2} = \frac{1}{\sqrt{ab}} \arctan \left(x \sqrt{\frac{b}{a}} \right) + C, \quad ab > 0.$$

$$900. \int \frac{xdx}{a + bx^2} = \frac{1}{2b} \ln \left| x^2 + \frac{a}{b} \right| + C$$

$$901. \int \frac{dx}{x(a + bx^2)} = \frac{1}{2a} \ln \left| \frac{x^2}{a + bx^2} \right| + C$$

$$902. \int \frac{dx}{a^2 - b^2x^2} = \frac{1}{2ab} \ln \left| \frac{a + bx}{a - bx} \right| + C$$

$$903. \int \frac{dx}{ax^2 + bx + c} = \frac{1}{\sqrt{b^2 - 4ac}} \ln \left| \frac{2ax + b - \sqrt{b^2 - 4ac}}{2ax + b + \sqrt{b^2 - 4ac}} \right| + C,$$

$$b^2 - 4ac > 0.$$

$$904. \int \frac{dx}{ax^2 + bx + c} = \frac{2}{\sqrt{4ac - b^2}} \arctan \frac{2ax + b}{\sqrt{4ac - b^2}} + C,$$

$$b^2 - 4ac < 0.$$