$$\int \frac{R(x)dx}{\sqrt{ax^2+bx+c}}$$

- (2.1) $$\int \frac{P(x)dx}{\sqrt{ax^2+bx+c}} = Q(x)\sqrt{ax^2+bx+c} + \lambda \int \frac{dx}{\sqrt{ax^2+bx+c}},\ \mathrm{deg}Q(x) < \mathrm{deg}P(x)$$
- (2.2) $$\int \frac{dx}{(x-\alpha)^k\sqrt{ax^2+bx+c}} = \left[t = \frac{1}{x-\alpha}\right] = \int \frac{t^{k-1}dt}{\sqrt{a_1t^2+b_1t+c_1}} = (2.1)$$
- (2.3) $$\int \frac{(Mx+N)dx}{(x^2+px+q)^k\sqrt{ax^2+bx+c}}$$
  - $\frac{b}{p} = \frac{c}{q} = a$: $$\int \frac{(Mx+N)dx}{(x^2+px+q)^{\frac{2k+1}{2}}}$$
    - $$\int \frac{(2x+p)dx}{(x^2+px+q)^{\frac{2k+1}{2}}} = \int \frac{d(x^2+px+q)}{(x^2+px+q)^{\frac{2k+1}{2}}} = \frac{2}{(1-2k)(x^2+px+q)^{\frac{2k-1}{2}}} + C$$
    - Or $[t = x + p/2] =$ (3)
    - $$\int \frac{dx}{(x^2+px+q)^{\frac{2k+1}{2}}} = \left[t = (\sqrt{x^2+px+q})' \text{ (Abel substitution)}\right] = \int R(t)dt$$
  - $\frac{b}{p} = a$: $[x = t - p/2]$
  - else: $\left[x = \frac{\alpha t+\beta}{t+1}\right]$
    - $$\int \frac{P(t)dt}{(t^2+\lambda)^k\sqrt{st^2+r}},\ \mathrm{deg}P(x) \leq 2k{-}1$$
      - $$\int \frac{tdt}{(t^2+\lambda)^k\sqrt{st^2+r}} = \left[u^2 = st^2+r\right] = \int R(u)du$$
      - $$\int \frac{dt}{(t^2+\lambda)^k\sqrt{st^2+r}} = \left[v = (\sqrt{st^2+r})' \text{ (Abel substitution)}\right] = \int R(v)dv$$