

# Иррациональные алгебраические функции—Интегралы

Интегралы, содержащие  $x^{1/2}$

$$180. \quad \int x^{p/2} dx = \frac{2}{p+2} x^{(p+2)/2},$$

$$180.1. \quad \int x^{1/2} dx = \int \sqrt{x} dx = \frac{2}{3} x^{3/2}.$$

$$180.3. \quad \int x^{3/2} dx = \frac{2}{5} x^{5/2}.$$

$$180.5. \quad \int x^{5/2} dx = \frac{2}{7} x^{7/2}.$$

$$181. \quad \int \frac{dx}{x^{p/2}} = -\frac{2}{(p-2) x^{(p-2)/2}}.$$

$$181.1. \quad \int \frac{dx}{x^{1/2}} = \int \frac{dx}{\sqrt{x}} = 2x^{1/2}. \quad 181.3. \quad \int \frac{dx}{x^{3/2}} = -\frac{2}{x^{1/2}}.$$

$$181.5. \quad \int \frac{dx}{x^{5/2}} = -\frac{2}{3x^{3/2}}. \quad 181.7. \quad \int \frac{dx}{x^{7/2}} = -\frac{2}{5x^{5/2}}.$$

- 185.11. 
$$\int \frac{x^{1/2} dx}{a^2 + b^2 x} = \frac{2x^{1/2}}{b^2} - \frac{2a}{b^3} \operatorname{arctg} \frac{bx^{1/2}}{a}.$$
- 185.13. 
$$\int \frac{x^{3/2} dx}{a^2 + b^2 x} = \frac{2}{3} \frac{x^{3/2}}{b^2} - \frac{2a^2 x^{1/2}}{b^4} + \frac{2a^3}{b^5} \operatorname{arctg} \frac{bx^{1/2}}{a}.$$
- 185.21. 
$$\int \frac{x^{1/2} dx}{(a^2 + b^2 x)^2} = -\frac{x^{1/2}}{b^2 (a^2 + b^2 x)} + \frac{1}{ab^3} \operatorname{arctg} \frac{bx^{1/2}}{a}.$$
- 185.23. 
$$\int \frac{x^{3/2} dx}{(a^2 + b^2 x)^2} = \frac{2x^{3/2}}{b^2 (a^2 + b^2 x)} + \frac{3a^2 x^{1/2}}{b^4 (a^2 + b^2 x)} - \frac{3a}{b^5} \operatorname{arctg} \frac{bx^{1/2}}{a}.$$
- 186.11. 
$$\int \frac{dx}{(a^2 + b^2 x) x^{1/2}} = \frac{2}{ab} \operatorname{arctg} \frac{bx^{1/2}}{a}.$$
- 186.13. 
$$\int \frac{dx}{(a^2 + b^2 x) x^{3/2}} = -\frac{2}{a^2 x^{1/2}} - \frac{2b}{a^3} \operatorname{arctg} \frac{bx^{1/2}}{a}.$$
- 186.21. 
$$\int \frac{dx}{(a^2 + b^2 x)^2 x^{1/2}} = \frac{x^{1/2}}{a^2 (a^2 + b^2 x)} + \frac{1}{a^3 b} \operatorname{arctg} \frac{bx^{1/2}}{a}.$$
- 186.23. 
$$\int \frac{dx}{(a^2 + b^2 x)^2 x^{3/2}} = -\frac{2}{a^2 (a^2 + b^2 x) x^{1/2}} - \frac{3b^2 x^{1/2}}{a^4 (a^2 + b^2 x)} - \frac{3b}{a^5} \operatorname{arctg} \frac{bx^{1/2}}{a}.$$
- 187.11. 
$$\int \frac{x^{1/2} dx}{a^2 - b^2 x} = -\frac{2x^{1/2}}{b^2} + \frac{a}{b^3} \ln \left| \frac{a + bx^{1/2}}{a - bx^{1/2}} \right|.$$
- 187.13. 
$$\int \frac{x^{3/2} dx}{a^2 - b^2 x} = -\frac{2}{3} \frac{x^{3/2}}{b^2} - \frac{2a^2 x^{1/2}}{b^4} + \frac{a^3}{b^5} \ln \left| \frac{a + bx^{1/2}}{a - bx^{1/2}} \right|.$$
- 187.21. 
$$\int \frac{x^{1/2} dx}{(a^2 - b^2 x)^2} = \frac{x^{1/2}}{b^2 (a^2 - b^2 x)} - \frac{1}{2ab^3} \ln \left| \frac{a + bx^{1/2}}{a - bx^{1/2}} \right|.$$
- 187.23. 
$$\int \frac{x^{3/2} dx}{(a^2 - b^2 x)^2} = \frac{3a^2 x^{1/2} - 2b^2 x^{3/2}}{b^4 (a^2 - b^2 x)} - \frac{3a}{2b^5} \ln \left| \frac{a + bx^{1/2}}{a - bx^{1/2}} \right|.$$
- 188.11. 
$$\int \frac{dx}{(a^2 - b^2 x) x^{1/2}} = \frac{1}{ab} \ln \left| \frac{a + bx^{1/2}}{a - bx^{1/2}} \right|.$$
- 188.13. 
$$\int \frac{dx}{(a^2 - b^2 x) x^{3/2}} = -\frac{2}{a^2 x^{1/2}} + \frac{b}{a^3} \ln \left| \frac{a + bx^{1/2}}{a - bx^{1/2}} \right|.$$
- 188.21. 
$$\int \frac{dx}{(a^2 - b^2 x)^2 x^{1/2}} = \frac{x^{1/2}}{a^2 (a^2 - b^2 x)} + \frac{1}{2a^3 b} \ln \left| \frac{a + bx^{1/2}}{a - bx^{1/2}} \right|.$$

$$188.23. \int \frac{dx}{(a^2 - b^2x)^2 x^{3/2}} = \frac{-2}{a^2(a^2 - b^2x)x^{1/2}} + \frac{3b^2x^{1/2}}{a^4(a^2 - b^2x)} + \frac{3b}{2a^5} \ln \left| \frac{a + bx^{1/2}}{a - bx^{1/2}} \right|.$$

$$189.1. \int \frac{x^{1/2} dx}{a^4 + x^2} = \frac{-1}{2a\sqrt{2}} \ln \frac{x + a\sqrt{2x} + a^2}{x - a\sqrt{2x} + a^2} + \frac{1}{a\sqrt{2}} \operatorname{arctg} \frac{a\sqrt{2x}}{a^2 - x}.$$

$$189.2. \int \frac{dx}{(a^4 + x^2)x^{1/2}} = \frac{1}{2a^3\sqrt{2}} \ln \frac{x + a\sqrt{2x} + a^2}{x - a\sqrt{2x} + a^2} + \frac{1}{a^3\sqrt{2}} \operatorname{arctg} \frac{a\sqrt{2x}}{a^2 - x}.$$

$$189.3. \int \frac{x^{1/2} dx}{a^4 - x^2} = \frac{1}{2a} \ln \left| \frac{a + x^{1/2}}{a - x^{1/2}} \right| - \frac{1}{a} \operatorname{arctg} \frac{x^{1/2}}{a}.$$

$$189.4. \int \frac{dx}{(a^4 - x^2)x^{1/2}} = \frac{1}{2a^3} \ln \left| \frac{a + x^{1/2}}{a - x^{1/2}} \right| + \frac{1}{a^3} \operatorname{arctg} \frac{x^{1/2}}{a}.$$