

I. Integrál nevlastní vlivem meze

$$1) \int_2^{\infty} \frac{1}{x} dx = \infty$$

$$2) \int_1^{\infty} \frac{2x^3 + 1}{x^2} dx = \infty$$

$$3) \int_3^{\infty} \frac{1}{(x-2)^2} dx = 1$$

$$4) \int_{\frac{1}{2}}^{\infty} \sqrt{2x+1} dx = \infty$$

$$5) \int_0^{\infty} \frac{1}{\sqrt{(x+1)^3}} dx = 2$$

$$6) \int_{-\infty}^{-0,5} \frac{1}{x^2 + x + 1} dx = \frac{\pi}{\sqrt{3}}$$

$$7) \int_{-\infty}^{\infty} \frac{1}{x^2 + 2x + 2} dx = \pi$$

$$8) \int_{-\infty}^{\infty} \frac{1}{x^2 - 2x + 5} dx = \frac{\pi}{2}$$

$$9) \int_{-\infty}^{-1} \frac{1}{(4x+1)^3} dx = -\frac{1}{72}$$

$$10) \int_{-\infty}^{\infty} \frac{dx}{x^2 + 4x + 9} = \frac{\pi}{\sqrt{5}}$$

$$11) \int_1^{\infty} \frac{\operatorname{arctg} x}{1+x^2} dx = \frac{3}{32} \pi^2$$

$$12) \int_2^{\infty} \frac{x}{\sqrt{x+2}} dx = \infty$$

II. Integrál nevlastní vlivem funkce

$$1) \int_0^4 \frac{dx}{\sqrt{x}} = 4$$

$$2) \int_0^1 \frac{dx}{\sqrt{1-x^2}} = \frac{\pi}{2}$$

$$3) \int_1^2 \frac{3x}{x-1} dx = \infty$$

$$4) \int_1^2 \frac{1}{\sqrt{x^2-1}} dx = \ln(2 + \sqrt{3})$$

$$5) \int_{\frac{\pi}{4}}^{\frac{\pi}{2}} \operatorname{tg} x dx = \infty$$

$$6) \int_0^1 \frac{x^2+1}{x-1} dx = -\infty$$

$$7) \int_0^1 \frac{x}{\sqrt{1-x^2}} dx = 1$$

$$8) \int_1^2 \frac{x}{\sqrt{x-1}} dx = \frac{8}{3}$$

$$9) \int_0^2 \frac{1}{\sqrt{2-x}} dx = 2\sqrt{2}$$

$$10) \int_1^2 \frac{1}{x^2-4x+3} dx = -\infty$$

$$11) \int_1^2 \frac{dx}{x \ln x} = \infty$$

$$12) \int_0^1 \ln x dx = -1$$

$$13) \int_{\frac{\pi}{2}}^{\pi} \frac{\sin x}{\cos^2 x} dx = \infty$$

$$14) \int_{-1}^2 \frac{dx}{x^3} \text{ diverguje}$$

III. Integrály s více singularitami

$$1) \int_0^{\infty} \frac{x+4}{x^3} dx = \infty$$

$$5) \int_2^3 \frac{dx}{\sqrt{(x-2) \cdot (3-x)}} = \pi$$

$$2) \int_{-2}^{\infty} \frac{1}{\sqrt{x+2}} dx = \infty$$

$$6) \int_0^{\infty} \frac{\operatorname{arctg} x}{x^2} dx = \infty$$

$$3) \int_1^{\infty} \frac{1}{x\sqrt{x-1}} dx = \pi$$

$$7) \int_1^{\infty} \frac{1}{x\sqrt{x^2-1}} dx = \frac{\pi}{2}$$

$$4) \int_{\frac{1}{2}}^{\infty} \frac{1}{x \cdot \ln^2 x} dx = \infty$$

$$8) \int_{-\infty}^1 \frac{1}{\sqrt[3]{x}} dx = -\infty$$

IV. Nevlastní integrály, pro jejichž výpočet musíte ovládat výpočet limit

$$1) \int_0^{\infty} x \cdot e^{-x} dx = 1$$

$$4) \int_0^e x^2 \ln x dx = \frac{2}{9} e^3$$

$$2) \int_2^{\infty} x e^{2-x} dx = 3$$

$$5) \int_{-\infty}^0 (x+3) e^x dx = 2$$

$$3) \int_{-\infty}^{-1} x e^{x+1} dx = -2$$

$$6) \int_{-\infty}^1 (2-x) e^{2x} dx = \frac{3}{4} e^2$$