

Całki niewłaściwe

$$1. \int_0^1 \frac{dx}{\sqrt{x^3}}, \quad I = \frac{\sqrt{5}}{2}$$

$$2. \int_0^2 \frac{dx}{\sqrt{4-x^2}}, \quad I = \frac{\pi}{2}$$

$$3. \int_1^3 \frac{dx}{\sqrt{(x-1)(3-x)}}, \quad I = \pi$$

$$4. \int_{-2}^0 \frac{1}{(2-x)^2} \cdot \sqrt[3]{\frac{2-x}{2+x}} dx, \quad I = \frac{3}{8} \sqrt[3]{2}$$

$$5. \int_0^1 \frac{x^2 dx}{\sqrt{x-x^2}}, \quad I = \frac{3}{8} \pi$$

$$6. \int_{-2}^{-1} \frac{dx}{x\sqrt{x^2-1}}, \quad I = -\frac{\pi}{3}$$

$$7. \int_0^{\frac{\pi}{2}} \frac{dx}{\cos^2 2x}, \quad I = +\infty$$

$$8. \int_0^{\frac{\pi}{2}} \operatorname{tg} x dx, \quad I = +\infty$$

$$1. \int_{-\infty}^{+\infty} \frac{(\arctg x)^2}{1+x^2} dx, \quad I = \frac{\pi^3}{12}$$

$$2. \int_{\sqrt{3}}^{+\infty} \frac{dx}{x^2+9}, \quad I = \frac{\pi}{9}$$

$$3. \int_1^{+\infty} \frac{dx}{x(x+1)^2}, \quad I = \ln 2 - \frac{1}{2}$$

$$4. \int_{\frac{\pi}{4}}^{\infty} x \cos x^2 dx, \quad \text{całka rozbieżna}$$

$$5. \int_0^{\infty} x \ln(x^2+1) dx, \quad I = \infty$$

$$6. \int_{-\infty}^{\infty} \frac{dx}{x^2-4x+13}, \quad I = \frac{1}{9} \pi$$

Zbadać zbieżność szeregów liczbowych

$$1. \sum_{n=1}^{\infty} \frac{1}{3n+1}; \quad (\text{rozb.})$$

$$2. \sum_{n=1}^{\infty} \frac{n}{e^{n^2}}; \quad (\text{zb.})$$

$$3. \sum_{n=1}^{\infty} \frac{n+2}{n^2-n}; \quad (\text{rozb.})$$

$$4. \sum_{n=1}^{\infty} \frac{(n!)^3}{(2n)!}; \quad (\text{rozb.})$$

$$5. \sum_{n=1}^{\infty} n \left(\frac{2}{7}\right)^n; \quad (\text{zb.})$$

$$6. \sum_{n=1}^{\infty} \left(\frac{n+3}{n+4}\right)^{n^2}; \quad (\text{zb.})$$

$$7. \sum_{n=1}^{\infty} (-1)^{n+1} \frac{\ln n}{n}; \quad (\text{zb.})$$

$$8. \sum_{n=1}^{\infty} (-1)^{n-1} \left(\frac{3n+4}{4n+2}\right)^n \quad (\text{zb. bery.})$$

$$9. \sum_{n=1}^{\infty} \frac{(-1)^n n!}{100^n}$$

$$10. \sum_{n=1}^{\infty} \frac{\cos(n\pi)}{n - \ln n}$$

$$11. \sum_{n=1}^{\infty} (-1)^{n+1} \frac{n+2}{n^2+3}$$