2. cvičení

Spočtěte:

1 $\displaystyle\int_0^1 \int_{-1}^2 \frac{3x^2}{y+2}\,\mathrm{d}x\,\mathrm{d}y$

2 $\displaystyle\int_{-1}^1 \int_0^3 (x^2+y^2)\,\mathrm{d}x\,\mathrm{d}y$

3 $\displaystyle\int_0^{\frac{\pi}{2}} \int_0^{\pi} \sin(x+2y)\,\mathrm{d}x\,\mathrm{d}y$

4 $\displaystyle\int_1^2 \int_0^1 (2y+3xy^2+x^3)\,\mathrm{d}y\,\mathrm{d}x$

5 $\displaystyle\int_0^2 \int_0^1 \frac{x}{(x+y)^2}\,\mathrm{d}y\,\mathrm{d}x$

6 $\displaystyle\int_1^2 \int_0^1 x^y\,\mathrm{d}x\,\mathrm{d}y$

7 $\displaystyle\int_0^2 \int_{-1}^1 (3x^2y^2+x^4y-x+y)\,\mathrm{d}x\,\mathrm{d}y$

8 $\displaystyle\int_0^{\sqrt{5}} \int_0^2 \frac{xy}{\sqrt{y^2+1}}\,\mathrm{d}x\,\mathrm{d}y$

9 $\displaystyle\int_3^6 \int_1^e \frac{y+\ln^2 x}{x}\,\mathrm{d}x\,\mathrm{d}y$

10 $\displaystyle\int_0^1 \int_1^2 (x+\ln y)\,\mathrm{d}y\,\mathrm{d}x$

11 $\displaystyle\int_0^1 \int_0^2 x\cdot e^{x+y}\,\mathrm{d}x\,\mathrm{d}y$

12 $\displaystyle\int_2^4 \int_0^{\frac{\pi}{2}} (x+y)\cdot\sin y\,\mathrm{d}y\,\mathrm{d}x$

13 $\displaystyle\int_0^{\sqrt[3]{3}} \int_0^{\sqrt{3}} \frac{y^2}{1+x^2}\,\mathrm{d}x\,\mathrm{d}y$

14 $\displaystyle\int_1^5 \int_0^1 \sqrt{2x+y}\,\mathrm{d}x\,\mathrm{d}y$

15 $\displaystyle\int_{\frac{1}{2}}^4 \int_0^2 xy\cdot\ln(xy)\,\mathrm{d}y\,\mathrm{d}x$

16 $\displaystyle\int_0^1 \int_0^1 \frac{1}{x+y}\,\mathrm{d}x\,\mathrm{d}y$

Výsledky: **1** $9\ln\frac{3}{2}$; **2** 20; **3** 0; **4** $\frac{25}{4}$; **5** $\ln 3$; **6** $\ln\frac{3}{2}$; **7** $\frac{152}{15}$; **8** $2\sqrt{6}-2$; **9** $\frac{29}{2}$; **10** $2\ln 2-\frac{1}{2}$; **11** e^3-e^2+e-1; **12** 8; **13** $\frac{\pi}{3}$; **14** $\frac{2}{15}(49\sqrt{7}-25\sqrt{5}-9\sqrt{3}+1)$; **15** $16\ln 8-\frac{63}{4}$; **16** $2\ln 2$.

Spočtěte:

1 $\displaystyle\int_0^1 \int_{x^2}^{\sqrt{x}} \frac{y^3}{x^2}\,\mathrm{d}y\,\mathrm{d}x$

2 $\displaystyle\int_0^{\frac{\pi}{2}} \int_{-x}^{x} \cos(x+y)\,\mathrm{d}y\,\mathrm{d}x$

3 $\displaystyle\int_0^1 \int_{y^2}^{y} 2y\cdot e^x\,\mathrm{d}x\,\mathrm{d}y$

4 $\displaystyle\int_0^1 \int_{\sqrt{1+y^2}}^{1+y} xy^2\,\mathrm{d}x\,\mathrm{d}y$

5 $\displaystyle\int_0^2 \int_0^{y^2} e^{\frac{x}{y}}\,\mathrm{d}x\,\mathrm{d}y$

6 $\displaystyle\int_0^e \int_{-x}^{x} e^{\frac{y}{x}}\,\mathrm{d}y\,\mathrm{d}x$

7 $\displaystyle\int_1^4 \int_{\frac{1}{x^2}}^{x^2} \sqrt{\frac{x}{y}}\,\mathrm{d}y\,\mathrm{d}x$

8 $\displaystyle\int_0^1 \int_{y^3}^{\frac{1}{y^3}} \sqrt[3]{\frac{y}{x^2}}\,\mathrm{d}x\,\mathrm{d}y$

9 $\displaystyle\int_0^1 \int_{-x}^{x} (x+2y)\cdot e^x\,\mathrm{d}y\,\mathrm{d}x$

10 $\displaystyle\int_0^{\frac{\pi}{2}} \int_{y}^{y+\pi} (x-y)\cdot\sin(x+y)\,\mathrm{d}x\,\mathrm{d}y$

11 $\displaystyle\int_{-1}^2 \int_0^{y} \frac{y^3}{x^2+y^2}\,\mathrm{d}x\,\mathrm{d}y$

12 $\displaystyle\int_1^e \int_{x}^{x^2} \frac{1}{x^2}\cdot\ln\frac{y}{x}\,\mathrm{d}y\,\mathrm{d}x$

Výsledky: **1** $\frac{3}{14}$; **2** 1; **3** $3-e$; **4** $\frac{1}{4}$; **5** e^2-1; **6** $\frac{e}{2}(e^2-1)$; **7** $\frac{104}{5}$; **8** $\frac{54}{7}$; **9** $2e-4$; **10** -2; **11** $\frac{3\pi}{4}$; **12** $3-e$.