Індивідуальне завдання.

1. За допомогою ейлеревих інтегралів обчислити наступні інтеграли:

1. $\int_0^3 x^2\sqrt{9-x^2}\,dx,$.
2. $\int_0^\infty \frac{x^2}{\left(2+3x^2\right)^2}dx.$
4. $\int_1^2 \frac{(x-1)^2(2-x)^2}{(x+1)^6}dx.$
5. $\int_0^\infty \frac{\sqrt[4]{x}}{(1+x)^2}dx.$
7. $\int_0^{\pi/2} \sin x\cos^2 x dx.$
8. $\int_0^1 x^3\left(1-x^3\right)^{\frac{1}{3}}dx.$
9. $\int_0^{\pi/2} tg^{\frac{1}{3}}x dx.$
10. $\int_0^{\pi/2} \sin^3 x\cos x dx.$
11. $\int_0^\infty \frac{\sqrt[5]{x}}{\left(1+x^3\right)^2}dx.$
12. $\int_0^1 x^3\left(\ln\frac{1}{x}\right)^5 dx.$
13. $\int_0^\infty \frac{sh3x}{ch5x}dx.$
14. $\int_0^2 x^2\sqrt{4-x^2}\,dx,$.
15. $\int_0^\infty \frac{x^2}{1+x^3}dx.$

16. $\int_0^{\pi/2} \sin^4 x \cos^4 x dx$.

17. $\int_1^3 \frac{(x-1)(3-x)^2}{(x+1)^5} dx$.

18. $\int_0^{\infty} \frac{x}{(1+2x)^2} dx$.

19. $\int_0^{\infty} \frac{x^5}{1+x^4} dx$.

20. $\int_0^5 x^2 \sqrt{5^2 - x^2}\, dx$, .

21. $\int_0^{\pi/2} \sin^3 x \cos^3 x dx$.

22. $\int_0^{\infty} \frac{shx}{ch2x} dx$.

23. $\int_{\pi/2}^{\pi} \sin^3\left(x - \frac{\pi}{2}\right) \cos^4\left(x - \frac{\pi}{2}\right) dx$.

24. $\int_0^4 x^2 \sqrt{16 - x^2}\, dx$, .

2. Виразити через ейлерові інтеграли:

1. $\int_0^{\infty} x^2 e^{-x^2} dx$.

2. $\int_0^{\pi} \frac{\sin^2 x}{\left(1 + \frac{1}{3}\cos x\right)^3} dx$.

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

5. $\int_0^{\infty} \frac{x^{\frac{1}{3}} \ln x}{1+x} dx$.

7. $\int_0^{\infty} \frac{x \ln x}{1+x^3} dx$.

8. $\int_0^{\infty} \frac{\ln^2 x}{1+x^4} dx$.

9. $\int_0^{\infty} \frac{x^3 - x^2}{(1+x)\ln x} dx$.

10. $\int_0^1 \frac{x^{-\frac{1}{2}} - x^{\frac{1}{2}}}{1-x} dx$.

11. $\int_0^{\infty} \frac{sh2x}{sh3x} dx$.

12. $\int_0^{\pi} \frac{\sin x}{\left(1+\frac{1}{2}\cos x\right)^2} dx$.

13. $\int_0^{\infty} \frac{x}{1+x^2} dx$.

14. $\int_0^{\infty} \frac{x^{\frac{1}{2}} \ln x}{1+x} dx$.

15. $\int_0^{\infty} x^4 e^{-x^2} dx$.

16. $\int_0^1 \frac{x^{-\frac{2}{3}} - x^{\frac{1}{3}}}{1-x} dx$.

17. $\int_0^{\pi/4} \sin^2 2x \cos^3 2x dx$.

18. $\int_{\pi}^{2\pi} \sin^3\left(\frac{x-\pi}{2}\right) \cos^4\left(\frac{x-\pi}{2}\right) dx$.

19. $\int_0^2 x^2 \sqrt{(2-x)(2+x)} dx$.

20. $\int_2^5 \frac{(x-2)(5-x)^2}{(x+1)^5} dx$.

21. $\int_0^{1/3} x^2 \sqrt{\frac{1}{9} - x^2}\, dx$.

22. $\int_0^{\infty} x^6 e^{-x^2}\, dx$.

23. $\int_0^{\pi/2} \sin^2 2x dx$.

24. $\int_0^{\infty} x^2 e^{-x^2+5}\, dx$.