12-amaliy mashg'ulot

KASR RATSIONAL VA BA'ZI IRRATSIONAL FUNKSIYALARNI INTEGRALLASH

1. Kasr ratsional funksiyalarni integrallash

Integrallarni hisoblang:

1. $\int \frac{dx}{x(2+x)}$. **2.** $\int \frac{dx}{x(5+2x)}$. **3.** $\int \frac{dx}{x\left(\frac{3}{2}+\frac{5}{7}x\right)}$.

4. $\int \frac{dx}{x(a+bx)}$. **5.** $\int \frac{dx}{(x+1)(x-3)}$. **6.** $\int \frac{dx}{(2x+3)(x+4)}$.

Integrallarni hisoblang:

5. $\int \frac{dx}{x(4+x^2)}$. **6.** $\int \frac{dx}{x(3+4x)^2}$. **7.** $\int \frac{dx}{x(a+bx)^2}$.

8. $\int \frac{dx}{(2+x)(x-3)^2}$. **9.** $\int \frac{dx}{(3-4x)(5-2x)^2}$. **10.** $\int \frac{dx}{(a+bx)(c+fx)^2}$.

Integrallarni hisoblang:

11. $\int \frac{dx}{x(a+bx)(c+fx)}$. **12.** $\int \frac{dx}{x(x^2+3x+5)}$. **13.** $\int \frac{dx}{(x-3)(3x^2+4x+2)}$.

14. $\int \frac{dx}{(2x+5)(x^2-4x+7)}$. **15.** $\int \frac{4x+8}{4x^2+6x-13}dx$. **16.** $\int \frac{x+2}{3x^2-x+5}dx$.

Integrallarni hisoblang:

17. $\int \frac{x^6-2x^4-3x^3-9x^2+4}{x^5-5x^3+4x}dx$. **18.** $\int \frac{x^5-2x^2+3}{x^2-4x+4}dx$.

19. $\int \frac{2x^4-3x^3+4x^2-5x+6}{x^2-3x+1}dx$. **20.** $\int \frac{x^3-x+1}{(x-2)^5}dx$.

Integrallarni hisoblang:

21. $\int \frac{x^2+1}{x(x-1)^3}dx$. **22.** $\int \frac{dx}{(x-2)^2(x+3)^3}$.

23. $\int \frac{dx}{(x+1)(x+2)^2(x+3)^3}$. **24.** $\int \frac{x^2}{(1-x^2)^3}dx$.

Integrallarni hisoblang:

25. $\int \frac{x^3+x+1}{x^4-1}dx$. **26.** $\int \frac{dx}{(x^2-4x+5)(x^2-4x+3)}$.

27. $\int \frac{x^3-6}{x^4+6x^2+8}dx$. **28.** $\int \frac{(3x^2-2)dx}{9x^4-13x^2+4}$.

29. $\int \frac{(3x^2-2)x\,dx}{(x+2)^2(3x^2-2x+4)}$. **30.** $\int \frac{18-11x}{(x^2-9x+20)(x^2+2x+2)}dx$.

2. Ba’zi irrasional ifodalarni integrallash

Quyidagi integrallarni hisoblang.

1. $\int \frac{dx}{\sqrt{x}+\sqrt[4]{x}}$. **2.** $\int \frac{dx}{\sqrt[3]{x}+\sqrt{x}}$.

3. $\int \frac{dx}{1+\sqrt{x+1}}$. **4.** $\int \frac{1+\sqrt{x+1}}{2+\sqrt{x+1}}dx$.

5. $\int \frac{dx}{\sqrt[3]{x}+2\sqrt[4]{x}+\sqrt{x}}$. **6.** $\int \frac{1-\sqrt{x+1}}{1+\sqrt[3]{x+1}}dx$..

7. $\int \frac{\sqrt{x+1}+1}{\sqrt{x+1}-1}dx$. **8.** $\int \frac{\sqrt{x+1}-\sqrt{x-1}}{\sqrt{x+1}+\sqrt{x-1}}dx$.

Quyidagi integrallarni (Eyler almashtirishlaridan foydalanib) hisoblang.

9. $\int \frac{dx}{1+\sqrt{x^2+2x+2}}$. **10.** $\int \frac{dx}{x\sqrt{4x^2+4x+3}}$. **11.** $\int \frac{dx}{(1+x)\sqrt{1+x+x^2}}$.

12. $\int \frac{dx}{x+\sqrt{x^2-x+1}}$. **13.** $\int \frac{dx}{x\sqrt{x^2-x-5}}$. **14.** $\int \frac{dx}{x+\sqrt{x^2-x+4}}$.

15. $\int \frac{dx}{x\sqrt{2+x-x^2}}$. **16.** $\int \frac{x\,dx}{\sqrt{(6x-8-x^2)^3}}$.

Quyidagi integrallarni, binomial differensiallarni integrallash usulidan foydalanib,hisoblang.

17. $\int \sqrt[3]{x}\left(1+\sqrt{x}\right)^2 dx$. **18.** $\int \frac{1}{\sqrt[6]{x}}\left(\sqrt[3]{x}-1\right)^2 dx$.

19. $\int \frac{dx}{\sqrt[4]{x^3}\left(\sqrt[8]{x}-1\right)^5}$. **20.** $\int \frac{dx}{x\left(1+\sqrt[3]{x}\right)^2}$.

21. $\int \frac{\sqrt{1+\sqrt[3]{x}}}{\sqrt[3]{x^2}}dx$. **22.** $\int \frac{\sqrt[3]{1+x^3}}{x^2}dx$.

23. $\int \sqrt{x}\sqrt[3]{1+\sqrt[4]{x^3}}dx$. **24.** $\int \frac{dx}{x\sqrt{1+x^3}}$.

Quyidagi integrallarni, $\int R\left(x,\sqrt{x^2+a^2}\right)dx$, $\int R\left(x,\sqrt{a^2-x^2}\right)dx$ ifodalarni integrallash usulidan foydalanib, hisoblang.

25. $\int \sqrt{9-x^2}dx$. **26.** $\int \sqrt{9-16x^2}dx$.

27. $\int \sqrt{a^2-b^2x^2}dx$. **28.** $\int \frac{dx}{\sqrt{(4-x^2)^3}}$.

29. $\int \frac{dx}{\sqrt{(a^2-b^2x^2)^3}}$. **30.** $\int \frac{dx}{x\sqrt{a^2-b^2x^2}}$.

31. $\int x\sqrt{(a^2-b^2x^2)^m}dx$. **32.** $\int x^2\sqrt{a^2-b^2x^2}dx$.