6. $\int \frac{2xdx}{(x+1)(x^2+1)^2}$. **(Жауабы:** $\frac{x-1}{2(x^2+1)} - \frac{1}{2}\ln|x+1| + \frac{1}{4}\ln(1+x^2) + C.$**)**

7. $\int \frac{\ln(x+1)}{\sqrt{x+1}}dx.$ **(Жауабы:** $2\sqrt{x+1}(\ln(x+1)-2)+C.$**)**

8. $\int e^{\sqrt[3]{x}}dx.$ **(Жауабы:** $3e^{\sqrt[3]{x}}\left(\sqrt[3]{x^2} - 2\sqrt[3]{x} + 2\right) + C.$**)**

7.1-ҮТ

Анықталмаған интегралдарды табыңыз

(№ 1-5 тапсырмаларда интегралдау нәтижесін дифференциалдау арқылы тексеріңіз**)**

1.

1.1. $\int \frac{3+\sqrt[3]{x^2}-2x}{\sqrt{x}}dx.$

1.2. $\int \frac{2x^2+3\sqrt{x}-1}{2x}dx.$

1.3. $\int \frac{3\sqrt{x}+4x^2-5}{2x^2}dx.$

1.4. $\int \frac{2\sqrt{x}-x^2+3}{\sqrt[3]{x}}dx.$

1.5. $\int \frac{\sqrt[4]{x}-2x+5}{x^2}dx.$

1.6. $\int \frac{2x^3-\sqrt{x}+4}{\sqrt{x}}dx.$

1.7. $\int \left(\sqrt[3]{x} - \frac{2\sqrt[4]{x}}{x} + 3\right)dx.$

1.8. $\int \frac{2x^3-\sqrt{x^5}+1}{\sqrt{x}}dx.$

1.9. $\int \frac{3x^2-\sqrt[5]{x}+2}{x}dx.$

1.10. $\int \frac{2x^3-\sqrt{x}+4}{x^2}dx.$

1.11. $\int \frac{\sqrt[6]{x^5}-5x^2+3}{x}dx.$

1.12. $\int \left(x\sqrt{x} - \frac{1}{\sqrt{x^3}} + 1\right)dx.$

1.13. $\int\left(x^2-\frac{\sqrt[6]{x}}{x}-3\right)dx.$

1.14. $\int\frac{\sqrt[3]{x^2}-2x^5+3}{x}dx.$

1.15. $\int\left(\frac{\sqrt[3]{x}}{x}+2x^3-4\right)dx.$

1.16. $\int\frac{\sqrt{x^3}-3x^4+2}{x}dx.$

1.17. $\int\left(2x^3-3\sqrt{x^5}+\frac{4}{x}\right)dx.$

1.18. $\int\frac{2x^3-\sqrt{x^5}+5}{x^2}dx.$

1.19. $\int\frac{3x^2-\sqrt{x^3}+7}{x^3}dx.$

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

1.21. $\int\left(\sqrt[5]{x^2}-\frac{2}{x^3}+4\right)dx.$

1.22. $\int\frac{\sqrt{x}-2x^3+6}{x}dx.$

1.23. $\int\frac{\sqrt[5]{x}-2x^3+4}{x^2}dx.$

1.24. $\int\left(\sqrt{x}-\frac{3x^2}{\sqrt{x^3}}+2\right)dx.$

1.25. $\int\left(\sqrt[5]{x}-\frac{4}{x^5}+2\right)dx.$

1.26. $\int\frac{\sqrt[7]{x^6}-2x^2+3}{x}dx.$

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

1.28. $\int\left(\frac{2x^2}{\sqrt{x}}-\frac{5}{x}+6\right)dx.$

1.29. $\int\left(\frac{\sqrt[3]{x^2}}{x}-\frac{7}{x^3}+5\right)dx.$

1.30. $\int\left(\frac{5x^2}{\sqrt{x}}-\sqrt[3]{x^2}+2\right)dx.$

2.

2.1. $\int\sqrt{3+x}\,dx.$

2.2. $\int\sqrt[3]{1+x}\,dx.$

2.3. $\int\sqrt[3]{(1+x)^2}\,dx.$

2.4. $\int\frac{dx}{\sqrt{1+x}}.$

2.5. $\int \frac{dx}{\sqrt{(1-x)^3}}$.

2.6. $\int \frac{dx}{\sqrt[3]{2+x}}$.

2.7. $\int (1-4x)^7\,dx$.

2.8. $\int (1+4x)^5\,dx$.

2.9. $\int (1-3x)^4\,dx$.

2.10. $\int \sqrt{1+3x}\,dx$.

2.11. $\int \sqrt{5-4x}\,dx$.

2.12. $\int \frac{dx}{\sqrt[3]{5+3x}}$.

2.13. $\int \frac{dx}{\sqrt[3]{(1-4x)^5}}$.

2.14. $\int \frac{dx}{\sqrt[3]{(3-4x)^2}}$.

2.15. $\int \frac{dx}{\sqrt[3]{2-5x}}$.

2.16. $\int \sqrt[5]{3-2x}\,dx$.

2.17. $\int \sqrt[4]{1+3x}\,dx$.

2.18. $\int \sqrt[3]{1+3x}\,dx$.

2.19. $\int \frac{dx}{\sqrt{(3-x)^5}}$.

2.20. $\int \frac{dx}{\sqrt[3]{3+x}}$.

2.21. $\int \frac{dx}{(2+x)^3}$.

2.22. $\int \sqrt[3]{5-2x}\,dx$.

2.23. $\int \sqrt{5-4x}\,dx$.

2.24. $\int \sqrt[5]{(6-5x)^2}\,dx$.

2.25. $\int \sqrt[4]{2-5x}\,dx$.

2.26. $\int \sqrt[3]{4-2x}\,dx$.

2.27. $\int \sqrt{3-4x}\,dx$.

2.28. $\int \sqrt[5]{3+2x}\,dx$.

2.29. $\int \sqrt[4]{(3+5x)^3}\,dx$.

2.30. $\int \sqrt[3]{(2-x)^2}\,dx$.

3 .

3.1. $\int \frac{dx}{3-x}$. **3.2.** $\int \frac{dx}{3x+9}$. **3.3.** $\int \frac{dx}{2-3x}$.

3.4. $\int \frac{dx}{1-4x}$. **3.5.** $\int \frac{dx}{2+3x}$. **3.6.** $\int \frac{dx}{2-5x}$.

3.7. $\int \frac{dx}{3x-2}$. **3.8.** $\int \frac{dx}{2x+3}$. **3.9.** $\int \frac{dx}{3x-4}$.

3.10. $\int \frac{dx}{4-3x}$. **3.11.** $\int \frac{dx}{3x+4}$. **3.12.** $\int \frac{dx}{4x-2}$.

3.13. $\int \frac{dx}{5-3x}$. **3.14.** $\int \frac{dx}{4-7x}$. **3.15.** $\int \frac{dx}{5x-3}$.

3.16. $\int \frac{dx}{3-2x}$. **3.17.** $\int \frac{dx}{5+3x}$. **3.18.** $\int \frac{dx}{3-5x}$.

3.19. $\int \frac{dx}{5+4x}$. **3.20.** $\int \frac{dx}{6-3x}$. **3.21.** $\int \frac{dx}{6+5x}$.

3.22. $\int \frac{dx}{1-7x}$. **3.23.** $\int \frac{dx}{1+6x}$. **3.24.** $\int \frac{dx}{2+7x}$.

3.25. $\int \frac{dx}{7-3x}$. **3.26.** $\int \frac{dx}{5-2x}$. **3.27.** $\int \frac{dx}{2x+7}$.

3.28. $\int \frac{dx}{2x+9}$. **3.29.** $\int \frac{dx}{7x-3}$. **3.30.** $\int \frac{dx}{6x+1}$.

4 .

4.1. $\int \sin(2-3x)\,dx$. **4.2.** $\int \sin(3-2x)\,dx$.

4.3. $\int \sin(5-3x)\,dx$. **4.4.** $\int \cos(2+3x)\,dx$.

4.5. $\int \cos(3+2x)\,dx$. **4.6.** $\int \sin(4-2x)\,dx$.

4.7. $\int \cos(5-2x)\,dx.$

4.8. $\int \cos(7x+3)\,dx.$

4.9. $\int \sin(8x-3)\,dx.$

4.10. $\int \sin(3+4x)\,dx.$

4.11. $\int \sin(3-4x)\,dx.$

4.12. $\int \cos(4x+3)\,dx.$

4.13. $\int \cos(3-4x)\,dx.$

4.14. $\int \cos(2+5x)\,dx.$

4.15. $\int \cos(3x+5)\,dx.$

4.16. $\int \sin(5x-3)\,dx.$

4.17. $\int \sin(5-3x)\,dx.$

4.18. $\int \sin(3x+6)\,dx.$

4.19. $\int \cos(5x-8)\,dx.$

4.20. $\int \cos(3x-7)\,dx.$

4.21. $\int \cos(5x-6)\,dx.$

4.22. $\int \sin(7x+1)\,dx.$

4.23. $\int \cos(7x+3)\,dx.$

4.24. $\int \sin(7-4x)\,dx.$

4.25. $\int \cos(3x-7)\,dx.$

4.26. $\int \sin(8x-5)\,dx.$

4.27. $\int \cos(8x-4)\,dx.$

4.28. $\int \sin(9x-1)\,dx.$

4.29. $\int \cos(10x-3)\,dx.$

4.30. $\int \sin(9x+7)\,dx.$

5.

5.1. $\int \frac{\sqrt{3}\,dx}{9x^2-3}.$

5.2. $\int \frac{dx}{\sqrt{9x^2+3}}.$

5.3. $\int \frac{dx}{9x^2+3}.$

5.4. $\int \frac{9\,dx}{\sqrt{9x^2-3}}.$

5.5. $\int \frac{dx}{\sqrt{3-9x^2}}.$

5.6. $\int \frac{dx}{7x^2-4}.$

5.7. $\int \frac{3\,dx}{\sqrt{7x^2-4}}.$

5.8. $\int \frac{dx}{5x^2+3}.$

5.9. $\int \frac{dx}{5x^2-3}.$

5.10. $\int \frac{dx}{\sqrt{3-5x^2}}.$

5.11. $\int \frac{dx}{\sqrt{5x^2+3}}.$

5.12. $\int \frac{dx}{\sqrt{4-7x^2}}.$

5.13. $\int \frac{\sqrt{5}\,dx}{\sqrt{3-4x^2}}$. **5.14.** $\int \frac{dx}{\sqrt{2x^2-9}}$. **5.15.** $\int \frac{dx}{\sqrt{2x^2+7}}$.

5.16. $\int \frac{dx}{\sqrt{3x^2+2}}$. **5.17.** $\int \frac{dx}{3x^2+2}$. **5.18.** $\int \frac{\sqrt{2}\,dx}{\sqrt{7-2x^2}}$.

5.19. $\int \frac{\sqrt{14}\,dx}{2x^2-7}$. **5.20.** $\int \frac{dx}{8x^2+9}$. **5.21.** $\int \frac{dx}{3x^2-2}$.

5.22. $\int \frac{dx}{4x^2+3}$. **5.23.** $\int \frac{dx}{\sqrt{4x^2+3}}$. **5.24.** $\int \frac{dx}{\sqrt{3-4x^2}}$.

5.25. $\int \frac{dx}{\sqrt{9-8x^2}}$. **5.26.** $\int \frac{dx}{4x^2-3}$. **5.27.** $\int \frac{dx}{8x^2-9}$.

5.28. $\int \frac{dx}{4x^2+7}$. **5.29.** $\int \frac{2\,dx}{4+3x^2}$. **5.30.** $\int \frac{2\,dx}{\sqrt{4x^2-3}}$.

6.

6.1. $\int \frac{2x\,dx}{\sqrt{5-4x^2}}$. **6.2.** $\int \frac{x\,dx}{\sqrt{5-3x^2}}$. **6.3.** $\int \frac{3x\,dx}{4x^2+1}$.

6.4. $\int \frac{4x\,dx}{\sqrt{3-4x^2}}$. **6.5.** $\int \frac{2x\,dx}{\sqrt{8x^2-9}}$. **6.6.** $\int \frac{4x\,dx}{\sqrt{4x^2+3}}$.

6.7. $\int \frac{x\,dx}{\sqrt{9-8x^2}}$. **6.8.** $\int \frac{\sqrt{3}x\,dx}{\sqrt{3x^2-2}}$. **6.9.** $\int \frac{2x\,dx}{\sqrt{3x^2-2}}$.

6.10. $\int \frac{2x\,dx}{\sqrt{7-2x^2}}$. **6.11.** $\int \frac{x\,dx}{2x^2-7}$. **6.12.** $\int \frac{x\,dx}{3x^2+8}$.

6.13. $\int \frac{2x\,dx}{3x^2-7}$. **6.14.** $\int \frac{2x\,dx}{\sqrt{2x^2+5}}$. **6.15.** $\int \frac{x\,dx}{\sqrt{7-3x^2}}$.

6.16. $\int \frac{x\,dx}{2x^2+9}$. **6.17.** $\int \frac{5x\,dx}{\sqrt{3-5x^2}}$. **6.18.** $\int \frac{x\,dx}{\sqrt{3x^2+8}}$.

6.19. $\int \frac{5x\,dx}{\sqrt{5x^2+3}}$. **6.20.** $\int \frac{x\,dx}{3x^2-6}$. **6.21.** $\int \frac{x\,dx}{5x^2+1}$.

6.22. $\int \frac{5x\,dx}{5x^2-3}$. **6.23.** $\int \frac{x\,dx}{2x^2-7}$. **6.24.** $\int \frac{9x\,dx}{\sqrt{1-9x^2}}$.

6.25. $\int \frac{3x\,dx}{9x^2+2}$. **6.26.** $\int \frac{5x\,dx}{\sqrt{7x^2-1}}$. **6.27.** $\int \frac{3x\,dx}{\sqrt{9x^2+5}}$.

6.28. $\int \frac{2x\,dx}{5x^2-3}$. **6.29.** $\int \frac{x\,dx}{3x^2-2}$. **6.30.** $\int \frac{7x\,dx}{7x^2+1}$.

7.

7.1. $\int \frac{dx}{\sqrt{2-5x^2}}$. **7.2.** $\int \frac{dx}{2x^2-5}$. **7.3.** $\int \frac{dx}{\sqrt{7x^2-3}}$.

7.4. $\int \frac{dx}{5x^2+2}$. **7.5.** $\int \frac{dx}{2x^2+3}$. **7.6.** $\int \frac{dx}{\sqrt{5x^2}+1}$.

7.7. $\int \frac{dx}{2x^2+9}$. **7.8.** $\int \frac{dx}{\sqrt{9-2x^2}}$. **7.9.** $\int \frac{dx}{\sqrt{9x^2+2}}$.

7.10. $\int \frac{dx}{5x^2-4}$. **7.11.** $\int \frac{dx}{3x^2-7}$. **7.12.** $\int \frac{dx}{3x^2+7}$.

7.13. $\int \frac{dx}{6x^2-7}$. **7.14.** $\int \frac{dx}{7x^2+6}$. **7.15.** $\int \frac{dx}{\sqrt{7-3x^2}}$.

7.16. $\int \frac{dx}{6x^2+1}$. **7.17.** $\int \frac{dx}{\sqrt{5x^2-1}}$. **7.18.** $\int \frac{dx}{3x^2-5}$.

7.19. $\int \frac{dx}{\sqrt{2-3x^2}}$. **7.20.** $\int \frac{dx}{\sqrt{8-3x^2}}$. **7.21.** $\int \frac{dx}{\sqrt{3x^2+8}}$.

7.22. $\int \frac{dx}{\sqrt{3x^2+2}}$. **7.23.** $\int \frac{dx}{2x^2+7}$. **7.24.** $\int \frac{dx}{4x^2-3}$.

7.25. $\int \frac{dx}{3x^2+4}$. **7.26.** $\int \frac{dx}{\sqrt{8x^2-9}}$. **7.27.** $\int \frac{dx}{\sqrt{5-4x^2}}$.

7.28. $\int \frac{dx}{\sqrt{1-3x^2}}$. **7.29.** $\int \frac{dx}{\sqrt{4x^2+5}}$. **7.30.** $\int \frac{dx}{3x^2-2}$.

8.

8.1. $\int e^{2x-7}dx$. **8.2.** $\int e^{3+5x}dx$. **8.3.** $\int e^{2-3x}dx$.

8.4. $\int e^{2x+1}dx$. **8.5.** $\int e^{7x-2}dx$. **8.6.** $\int e^{5x-7}dx$.

8.7. $\int e^{5x+7}dx$. **8.8.** $\int e^{7-2x}dx$. **8.9.** $\int e^{3-4x}dx$.

8.10. $\int e^{10x+2}dx$. **8.11.** $\int e^{2x-10}dx$. **8.12.** $\int e^{4x+3}dx$.

8.13. $\int e^{4x+5}dx$. **8.14.** $\int e^{6x-1}dx$. **8.15.** $\int e^{5-2x}dx$.

8.16. $\int e^{4-3x}dx$. **8.17.** $\int e^{3-5x}dx$. **8.18.** $\int e^{1-4x}dx$.

8.19. $\int e^{2-5x}dx$. **8.20.** $\int e^{6x-4}dx$. **8.21.** $\int e^{8x+1}dx$.

8.22. $\int e^{2-6x}dx$. **8.23.** $\int e^{2-4x}dx$. **8.24.** $\int e^{3-6x}dx$.

8.25. $\int e^{4-5x}dx$. **8.26.** $\int e^{5-x}dx$. **8.27.** $\int e^{7+3x}dx$.

8.28. $\int e^{2x+3}dx$. **8.29.** $\int e^{8x+1}dx$. **8.30.** $\int e^{4-7x}dx$.

9.

9.1. $\int \frac{dx}{(2x+1)\sqrt[3]{\ln^2(2x+1)}}$. **9.2.** $\int \frac{\sqrt[3]{\ln^2(1-x)}}{x-1}dx$.

9.3. $\int \frac{dx}{(1-x)\sqrt[3]{\ln^2(1-x)}}$. **9.4.** $\int \frac{dx}{(1-x)\sqrt{\ln^3(1-x)}}$.

9.5. $\int \frac{\ln^3(1-x)}{x-1}dx$. **9.6.** $\int \frac{\sqrt{\ln(2x-1)}}{2x-1}dx$.

9.7. $\int \frac{\sqrt[3]{\ln(3x+1)}}{3x+1}dx.$

9.8. $\int \frac{dx}{(x+1)\ln^2(x+1)}.$

9.9. $\int \frac{dx}{(x+1)\sqrt[3]{\ln(x+1)}}.$

9.10. $\int \frac{\sqrt[5]{\ln^2(x+1)}}{x+1}dx.$

9.11. $\int \frac{\sqrt{\ln^5(x+1)}}{x+1}dx.$

9.12. $\int \frac{\sqrt[7]{\ln^2(x+1)}}{x+1}dx.$

9.13. $\int \frac{\sqrt{\ln^3(x+1)}}{x+1}dx.$

9.14. $\int \frac{dx}{(x+1)\sqrt[5]{\ln(x+1)}}.$

9.15. $\int \frac{\sqrt{\ln^7(x+1)}}{x+1}dx.$

9.16. $\int \frac{dx}{(x+2)\sqrt{\ln(x+2)}}.$

9.17. $\int \frac{\ln^4(3x+1)}{3x+1}dx.$

9.18. $\int \frac{dx}{(x-3)\ln^4(x-3)}.$

9.19. $\int \frac{dx}{(x+5)\ln^3(x+5)}.$

9.20. $\int \frac{\ln^3(x-5)}{x-5}dx.$

9.21. $\int \frac{\sqrt[3]{\ln(x+4)}}{x+4}dx.$

9.22. $\int \frac{\ln^5(x-7)}{x-7}dx.$

9.23. $\int \frac{\sqrt{\ln^3(x+3)}}{x+3}dx.$

9.24. $\int \frac{\sqrt[3]{\ln^4(x-5)}}{x-5}dx.$

9.25. $\int \frac{dx}{(x+3)\ln^4(x+3)}.$

9.26. $\int \frac{\ln^5(x-8)}{x-8}dx.$

9.27. $\int \frac{\sqrt{\ln^3(x+6)}}{x+6}dx.$

9.28. $\int \frac{dx}{(x-4)\ln^5(x-4)}.$

9.29. $\int \frac{\ln^6(x+9)}{x+9}dx.$

9.30. $\int \frac{\ln(3x+5)}{(3x+5)}dx.$

10.

10.1. $\int \sin^4 2x\cos 2x\,dx.$

10.2. $\int \frac{\cos 2x}{\sin^3 2x}dx.$

10.3. $\int \frac{\sin 3x}{\cos^4 3x}dx.$

10.4. $\int \frac{\sin x}{\sqrt[3]{\cos x}}dx.$

10.5. $\int \frac{\sin x}{\cos^5 x}dx.$

10.6. $\int \cos^7 2x\sin 2x\,dx.$

10.7. $\int \frac{\cos x}{\sin x+2}dx.$

10.8. $\int \frac{\cos x}{3-\sin x}dx.$

10.9. $\int \frac{\sin x}{\sqrt{\cos x+3}}dx.$

10.10. $\int \frac{\sin x}{\sqrt[3]{\cos x+1}}dx.$

10.11. $\int \frac{\cos x}{\sqrt{(\sin x-4)^3}}dx.$

10.12. $\int \frac{\sin 3x}{\cos^2 3x}dx.$

10.13. $\int \frac{\sin 5x}{\sqrt{\cos 5x}}dx.$

10.14. $\int \frac{\cos 4x}{\sin^3 4x}dx.$

10.15. $\int \sin^3 4x\cos 4x\,dx.$

10.16. $\int \sqrt[3]{\cos 2x}\sin 2x\,dx.$

10.17. $\int \sqrt{\cos^3 2x}\sin 2x\,dx.$

10.18. $\int \frac{\sin 4x}{\sqrt[3]{\cos^2 4x}}dx.$

10.19. $\int \sin^3 5x\cos 5x\,dx.$

10.20. $\int \frac{\cos 5x}{\sqrt{\sin^3 5x}}dx.$

10.21. $\int \frac{\sin 5x}{\cos^4 5x}dx.$

10.22. $\int \sqrt{\cos 7x}\sin 7x\,dx.$

10.23. $\int \sin^6 3x\cos 3x\,dx.$

10.24. $\int \frac{\cos 6x}{\sin^7 6x}dx.$

10.25. $\int \sqrt{\cos^3 2x}\sin 2x\,dx.$

10.26. $\int \sin^4 8x\cos 8x\,dx.$

10.27. $\int \sin^5 4x\cos 4x\,dx.$

10.28. $\int \frac{\sin 4x}{\sqrt[3]{\cos 4x}}dx.$

10.29. $\int \frac{\sin 2x}{\sqrt[3]{\cos^4 2x}}dx.$

10.30. $\int \frac{\cos 6x}{\sin^4 6x}dx.$

11.

11.1. $\int \frac{\sqrt{\operatorname{tg}^3 x}}{\cos^2 x}dx.$

11.2. $\int \frac{dx}{\cos^2 x\sqrt{\operatorname{tg}^3 x}}.$

11.3. $\int \frac{dx}{\sin^2 x\operatorname{ctg}^4 x}.$

11.4. $\int \frac{\operatorname{ctg}^5 2x}{\sin^2 2x}dx.$

11.5. $\int \frac{\operatorname{tg}^3 4x}{\cos^2 4x}dx.$

11.6. $\int \frac{\sqrt[3]{\operatorname{tg} 5x}}{\cos^2 5x}dx.$

11.7. $\int \frac{\sqrt[3]{\operatorname{ctg}^2 x}}{\sin^2 x}dx.$

11.8. $\int \frac{dx}{\sin^2 x\operatorname{ctg}^3 x}.$

11.9. $\int \frac{dx}{\cos^2 3x\operatorname{tg}^4 3x}.$

11.10. $\int \frac{\sqrt{\operatorname{ctg} 7x}}{\sin^2 7x}dx.$

11.11. $\int \frac{\sqrt[5]{\operatorname{ctg} 3x}}{\sin^2 3x}dx.$

11.12. $\int \frac{\operatorname{tg}^4 7x}{\cos^2 7x}dx.$

11.13. $\int \frac{\operatorname{ctg}^5 6x}{\sin^2 6x}dx.$

11.14. $\int \frac{\sqrt[3]{\operatorname{tg}^5 4x}}{\cos^2 4x}dx.$

11.15. $\int \frac{\operatorname{ctg}^4 3x}{\sin^2 3x}dx.$

11.16. $\int \frac{dx}{\cos^2 4x\sqrt{\operatorname{tg} 4x}}.$

11.17. $\int \frac{dx}{\sin^2 3x\operatorname{ctg}^3 3x}.$

11.18. $\int \frac{\operatorname{tg} 6x}{\cos^2 6x}dx.$

11.19. $\int \frac{dx}{\sin^2 x \operatorname{ctg}^3 x}$.

11.20. $\int \frac{\sqrt{\operatorname{ctg} 4x}}{\sin^2 4x} dx$.

11.21. $\int \frac{ctg^5 4x}{\sin^2 4x} dx$.

11.22. $\int \frac{\sqrt[3]{\operatorname{ctg} 7x}}{\cos^2 7x} dx$.

11.23. $\int \frac{\sqrt[5]{\operatorname{tg}^2 3x}}{\cos^2 3x} dx$.

11.24. $\int \frac{\sqrt{\operatorname{ctg}^3 5x}}{\sin^2 5x} dx$.

11.25. $\int \frac{dx}{\sin^2 x \sqrt[5]{\operatorname{ctg}^4 x}}$.

11.26. $\int \frac{dx}{\cos^2 x \sqrt[5]{\operatorname{tg}^2 x}}$.

11.27. $\int \frac{\operatorname{tg}^6 2x}{\cos^2 2x} dx$.

11.28. $\int \frac{\sqrt{\operatorname{ctg}^5 x}}{\sin^2 x} dx$.

11.29. $\int \frac{\sqrt[5]{\operatorname{ctg}^2 x}}{\sin^2 x} dx$.

11.30. $\int \frac{\operatorname{tg}^7 3x}{\cos^2 3x} dx$.

12.

12.1. $\int \frac{\sqrt{\operatorname{arctg}^6 3x}}{1+9x^2} dx$.

12.2. $\int \frac{\sqrt[3]{\arcsin x}}{\sqrt{1-x^2}} dx$.

12.3. $\int \frac{\arccos^2 3x}{\sqrt{1-9x^2}} dx$.

12.4. $\int \frac{\operatorname{arcctg}^3 2x}{1+4x^2} dx$.

12.5. $\int \frac{\sqrt[3]{\arccos^2 x}}{\sqrt{1-x^2}} dx$.

12.6. $\int \frac{dx}{\left(1+x^2\right) \operatorname{arctg}^3 x}$.

12.7. $\int \frac{\arccos 3x}{\sqrt{1-9x^2}} dx$.

12.8. $\int \frac{\sqrt[3]{\operatorname{arctg}^2 x}}{1+x^2} dx$.

12.9. $\int \frac{\arcsin^5 2x}{\sqrt{1-4x^2}} dx$.

12.10. $\int \frac{dx}{\sqrt{1-x^2} \arcsin^4 x}$.

12.11. $\int \frac{\arccos^3 2x}{\sqrt{1-4x^2}}dx.$

12.12. $\int \frac{\operatorname{arcctg}^7 3x}{1+9x^2}dx.$

12.13. $\int \frac{\arccos 4x}{\sqrt{1-16x^2}}dx.$

12.14. $\int \frac{\arcsin^4 x}{\sqrt{1-x^2}}dx.$

12.15. $\int \frac{\arcsin^3 2x}{\sqrt{1-4x^2}}dx.$

12.16. $\int \frac{dx}{\left(1+x^2\right)\operatorname{arctg}^7 x}.$

12.17. $\int \frac{\sqrt[3]{\operatorname{arctg} 2x}}{1+4x^2}dx.$

12.18. $\int \frac{\operatorname{arcctg}^6 3x}{1+9x^2}dx.$

12.19. $\int \frac{\sqrt{\operatorname{arcctg}^3 x}}{1+x^2}dx.$

12.20. $\int \frac{dx}{\left(1+x^2\right)\sqrt{\operatorname{arctg} x}}.$

12.21. $\int \frac{dx}{\left(1+x^2\right)\operatorname{arctg}^5 x}.$

12.22. $\int \frac{\arccos^7 x}{\sqrt{1-x^2}}dx.$

12.23. $\frac{\sqrt[3]{\arccos 2x}}{\sqrt{1-4x^2}}dx.$

12.24. $\int \frac{\operatorname{arcctg}^4 5x}{1+25x^2}dx.$

12.25. $\int \frac{\arcsin^2 5x}{\sqrt{1-25x^2}}dx.$

12.26. $\int \frac{dx}{\sqrt{1-25x^2}\arcsin 5x}.$

12.27. $\int \frac{\operatorname{arctg}^8 3x}{1+9x^2}dx.$

12.28. $\int \frac{\arccos^2 7x}{\sqrt{1-49x^2}}dx.$

12.29. $\int \frac{\sqrt[5]{\operatorname{arctg}^3 x}}{1+x^2}dx.$

12.30. $\int \frac{\operatorname{arcctg}^4 8x}{1+64x^2}dx.$

13.

13.1. $\int \frac{x\,dx}{e^{3x^2+4}}.$

13.2. $\int \frac{x\,dx}{e^{x^2+3}}.$

13.3. $\int \frac{x^2 dx}{e^{x^3+1}}$.

13.4. $\int e^{\cos x} \sin x\, dx$.

13.5. $\int e^{2x^3-1} x^2 dx$.

13.6. $\int \frac{\sin x}{e^{\cos x}} dx$.

13.7. $\int e^{7x^2+2} x\, dx$.

13.8. $\int e^{3-x^2} x\, dx$.

13.9. $\int e^{4x^2+5} x\, dx$.

13.10. $\int \frac{dx}{\sqrt{1-x^2}\, e^{\arcsin x}}$.

13.11. $\int e^{5x^2-3} x\, dx$.

13.12. $\int e^{1-4x^2} x\, dx$.

13.13. $\int e^{3x^2+4} x\, dx$.

13.14. $\int e^{\sin x+1} \cos x\, dx$.

13.15. $\int e^{4-x^2} x\, dx$.

13.16. $\int e^{tgx} \frac{1}{\cos^2 x} dx$.

13.17. $\int e^{3\cos x+2} \sin x\, dx$.

13.18. $\int e^{4\sin x-1} \cos x\, dx$.

13.19. $\int e^{5x^2-3} x\, dx$.

13.20. $\int e^{5-2x^2} x\, dx$.

13.21. $\int e^{4-3x^2} x\, dx$.

13.22. $\int e^{\cos 2x} \sin 2x\, dx$.

13.23. $\int e^{1-6x^2} x\, dx$.

13.24. $\int e^{x^3+1} x^2 dx$.

13.25. $\int \frac{e^{arctgx}}{1+x^2} dx$.

13.26. $\int e^{3x^3} x^2 dx$.

13.27. $\int \frac{x^4}{e^{x^5+1}} dx$.

13.28. $\int \frac{x}{e^{x^2-3}} dx$.

13.29. $\int \frac{x}{e^{2x^2+1}} dx$.

13.30. $\int e^{4-5x^2} x\, dx$.

14.

14.1. $\int \frac{x-1}{7x^2+4} dx$.

14.2. $\int \frac{1-2x}{5x^2-1} dx$.

14.3. $\int \frac{2x+1}{5x^2+1}dx.$

14.4. $\int \frac{x+3}{\sqrt{x^2+4}}dx.$

14.5. $\int \frac{3x-2}{2x^2+7}dx.$

14.6. $\int \frac{5-x}{3x^2+1}dx.$

14.7. $\int \frac{5+x}{3x^2+1}dx.$

14.8. $\int \frac{2x-5}{\sqrt{7x^2+3}}dx.$

14.9. $\int \frac{2x-3}{\sqrt{x^2+9}}dx.$

14.10. $\int \frac{3x-2}{3x^2+1}dx.$

14.11. $\int \frac{x-1}{5-2x^2}dx.$

14.12. $\int \frac{2x+3}{1-3x^2}dx.$

14.13. $\int \frac{2x+3}{5x^2+2}dx.$

14.14. $\int \frac{x-3}{4x^2+1}dx.$

14.15. $\int \frac{x-3}{1-4x^2}dx.$

14.16. $\int \frac{3x-1}{4-x^2}dx.$

14.17. $\int \frac{5x-2}{x^2+9}dx.$

14.18. $\int \frac{2x+5}{\sqrt{5x^2+1}}dx.$

14.19. $\int \frac{1-2x}{\sqrt{3x^2+2}}dx.$

14.20. $\int \frac{2x-4}{x^2+16}dx.$

14.21. $\int \frac{2x-3}{\sqrt{4-x^2}}dx.$

14.22. $\int \frac{2x-1}{\sqrt{5-3x^2}}dx.$

14.23. $\int \frac{3x+4}{5-2x^2}dx.$

14.24. $\int \frac{3x-3}{\sqrt{1-x^2}}dx.$

14.25. $\int \frac{5x+2}{\sqrt{x^2+9}}dx.$

14.26. $\int \frac{3-2x}{x^2-8}dx.$

14.27. $\int \frac{x-5}{8-4x^2}dx.$

14.28. $\int \frac{x+4}{7x^2+3}dx.$

14.29. $\int \frac{3x+2}{\sqrt{2x^2-1}}dx.$ **14.30.** $\int \frac{x-5}{\sqrt{4-9x^2}}dx.$

7.1– шығару үлгісі (§ 7.2; 7.2.1 *п. қараңыз*)

Анықталмаған интегралдарды табу керек (**1-5** ***тапсырмалардың интегралдарының нәтижелерін дифференциалдап тексеру керек***).

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

► Интеграл астындағы функцияны бөліміне бөліп және § 7.1, 3° а), б) қасиеттерін, сонымен бірге анықталмаған интегралдардың негізгі кестесін пайдаланып табамыз:

$$\int \frac{3-2x^4+\sqrt[3]{x^2}}{\sqrt[4]{x}}dx = 3\int x^{-\frac{1}{4}}dx - 2\int x^{\frac{15}{4}}dx + \int x^{\frac{5}{12}}dx =$$

$$= 4x^{\frac{3}{4}} - \frac{8}{19}x^{\frac{19}{4}} + \frac{12}{17}x^{\frac{17}{12}} + C = 4\sqrt[4]{x^3} - \frac{8}{19}\sqrt[4]{x^{19}} + \frac{12}{17}\sqrt[12]{x^{17}} + C.$$

Алынған нәтижені тексереміз:

$$\left(4x^{\frac{3}{4}} - \frac{8}{19}x^{\frac{19}{4}} + \frac{12}{17}x^{\frac{17}{12}} + C\right)' = 4\cdot\frac{3}{4}x^{-\frac{1}{4}} - \frac{8}{19}\frac{19}{4}x^{\frac{15}{4}} + \frac{12}{17}\frac{17}{12}x^{\frac{5}{12}} =$$

$$= 3x^{-\frac{1}{4}} - 2x^{\frac{15}{4}} + x^{\frac{5}{12}}. \quad ◄$$

Назарыңызға: 7.2.1п. 1 а,б мысалдарды қараңыз.

2. $\int \frac{dx}{\sqrt[5]{(4-8x)^2}}.$

► § 7.1, 4°-қасиетті пайдаланамыз:

$$\int \frac{dx}{\sqrt[5]{(4-8x)^2}} = \int (4-8x)^{-\frac{2}{5}} dx = -\frac{5}{8\cdot 3}(4-8x)^{\frac{3}{5}} + C = -\frac{5}{24}\sqrt[5]{(4-8x)^3} + C.$$

Нәтижені тексереміз:

$$\left(-\frac{5}{24}(4-8x)^{\frac{3}{5}} + C\right)' = -\frac{5}{24}\,\frac{3}{5}(4-8x)^{-\frac{2}{5}}(-8) = (4-8x)^{-\frac{2}{5}}. \quad \blacktriangleleft$$

3. $\int \frac{dx}{6-7x}$.

► §7.1, 3°-қасиетті пайдаланамыз: $\int \frac{dx}{6-7x} = -\frac{1}{7}\ln|6-7x| + C.$

Алынған нәтижені тексереміз:

$$\left(-\frac{1}{7}\ln|6-7x| + C\right)' = -\frac{1}{7}\,\frac{1}{6-7x}\cdot(-7) = \frac{1}{6-7x}. \quad \blacktriangleleft$$

4. $\int \cos(2-5x)\,dx$.

► §7.1, 3°-қасиетті пайдаланамыз:

$$\int \cos(2-5x)\,dx = -\frac{1}{5}\sin(2-5x) + C.$$

Нәтижені тексеруді орындаймыз:

$$\left(-\frac{1}{5}\sin(2-5x) + C\right)' = -\frac{1}{5}\cos(2-5x)\cdot(-5) = \cos(2-5x). \quad \blacktriangleleft$$

5. $\int \frac{3\,dx}{\sqrt{4x^2-3}}$.

► § 7.1, 3°-қасиетті пайдаланамыз:

$$\int \frac{3\,dx}{\sqrt{4x^2-3}} = \frac{3}{2}\int \frac{d(2x)}{\sqrt{(2x)^2-3}} = \frac{3}{2}\ln\left|2x+\sqrt{4x^2-3}\right| + C.$$

Алынған нәтижені тексереміз:

$$\left(\frac{3}{2}\ln\left|2x+\sqrt{4x^2-3}\right| + C\right)' = \frac{3}{2}\left(\frac{2+\dfrac{8x}{2\sqrt{4x^2-3}}}{2x+\sqrt{4x^2-3}}\right) =$$

$$= \frac{3}{2}\frac{2\left(\sqrt{4x^2-3}+2x\right)}{\left(2x+\sqrt{4x^2-3}\right)\sqrt{4x^2-3}} = \frac{3}{\sqrt{4x^2-3}}. \quad \blacktriangleleft$$

6. $\int \frac{7xdx}{3x^2+4}.$

► Бөлшектің алымын оның бөлімінің туындысы шығатындай етіп түрлендіреміз және 7.2.1п. теореманы пайдаланамыз (1 а, б- мысалды қараңыз):

$$\int \frac{7xdx}{3x^2+4} = \frac{7}{6}\int \frac{6xdx}{3x^2+4} = \frac{7}{6}\ln\left(3x^2+4\right) + C. \quad \blacktriangleleft$$

7. $\int \frac{dx}{\sqrt{6-5x^2}}.$

► $\int \frac{dx}{\sqrt{6-5x^2}} = \frac{1}{\sqrt{5}}\int \frac{d\left(\sqrt{5}x\right)}{\sqrt{\left(\sqrt{6}\right)^2-\left(\sqrt{5}x\right)^2}} = \frac{1}{\sqrt{5}}\arcsin\frac{\sqrt{5}x}{\sqrt{6}} + C.$ ◄

8. $\int e^{5-4x}dx.$

▶ $\int e^{5-4x}dx=-\frac{1}{4}\int e^{5-4x}d\left(5-4x\right)=-\frac{1}{4}e^{5-4x}+C.$ ◀

9. $\int\frac{\sqrt[7]{\ln^3\left(x+2\right)}}{x+2}dx.$

.▶

$$\int\frac{\sqrt[7]{\ln^3\left(x+2\right)}}{x+2}dx=\int\ln^{\frac{3}{7}}\left(x+2\right)d\left(\ln\left(x+2\right)\right)=\frac{7}{10}\ln^{\frac{10}{7}}\left(x+2\right)+C=$$

$$=\frac{7}{10}\sqrt[7]{\ln^{10}\left(x+2\right)}+C.$$ ◀

10. $\int\frac{\cos 3xdx}{\sqrt[5]{\sin 3x-4}}.$

▶

$$\int\frac{\cos 3xdx}{\sqrt[5]{\sin 3x-4}}=\frac{1}{3}\int\left(\sin 3x-4\right)^{-\frac{1}{5}}3\cos 3xdx=\frac{1}{3}\int\left(\sin 3x-4\right)^{-\frac{1}{5}}d\left(\sin 3x-4\right)=$$

$$=\frac{1}{3}\frac{5}{4}\left(\sin 3x-4\right)^{\frac{4}{5}}+C=\frac{5}{12}\sqrt[5]{\left(\sin 3x-4\right)^4}+C.$$ ◀

11. $\int\frac{dx}{\sin^2 4x\sqrt[3]{ctg^2 4x}}.$

▶ $\int\frac{dx}{\sin^2 4x\sqrt[3]{\operatorname{ctg}^2 4x}}=-\frac{1}{4}\int\operatorname{ctg}^{-\frac{2}{3}}4x\left(-\frac{4}{\sin^2 4x}dx\right)=$

$$=\frac{1}{4}\int\operatorname{ctg}^{-\frac{2}{3}}4x\,d\left(\operatorname{ctg}4x\right)=-\frac{3}{4}\operatorname{ctg}^{\frac{1}{3}}4x+C=-\frac{3}{4}\sqrt[3]{\operatorname{ctg}4x}+C.$$ ◀

12. $\int\frac{\sqrt[3]{\operatorname{arcctg}^5 2x}}{1+4x^2}dx.$

▶ $$\int \frac{\sqrt[3]{\operatorname{arcctg}^5 2x}}{1+4x^2}\,dx = -\frac{1}{2}\int \operatorname{arcctg}^{\frac{5}{2}} 2x\left(-\frac{2}{1+4x^2}\right)dx =$$

$$= -\frac{1}{2}\int \operatorname{arcctg}^{\frac{5}{3}} 2x\, d\left(\operatorname{arcctg} 2x\right) =$$

$$= -\frac{1}{2}\frac{3}{8}\operatorname{arcctg}^{\frac{8}{3}} 2x + C = -\frac{3}{16}\sqrt[3]{\operatorname{arcctg}^8 2x} + C. \quad ◀$$

13. $\int e^{3\cos x+2}\sin x dx.$

▶

$$\int e^{3\cos x+2}\sin x dx = -\frac{1}{3}\int e^{3\cos x+2} d\left(3\cos x+2\right) = -\frac{1}{3}e^{3\cos x+2} + C.$$

◀

14. $\int \frac{3x+10}{6x^2-4}\,dx.$

▶ $$\int \frac{3x+10}{6x^2-4}\,dx = \int \frac{3xdx}{6x^2-4} + 10\int \frac{dx}{6x^2-4} = \frac{1}{4}\int \frac{12xdx}{6x^2-4} +$$

$$+\frac{10}{\sqrt{6}}\int \frac{\sqrt{6}dx}{\left(\sqrt{6}x\right)^2-2^2} = = \frac{1}{4}\ln\left|6x^2-4\right| + \frac{5}{2\sqrt{6}}\ln\left|\frac{\sqrt{6}x-2}{\sqrt{6}x+2}\right| + C. \quad ◀$$

7.2–YT

Anıqtalmağan integraldı tabıŋız

1.

1.1 $\int \frac{2-3x}{x^2+2}dx.$ **Jauabı:** $\sqrt{2}\operatorname{arctg}\frac{x}{\sqrt{2}} - \frac{3}{2}\ln\left|x^2+2\right| + C.$

1.2. $\int \frac{3-5x}{\sqrt{1-x^2}}dx.$ **Jauabı:** $3\arcsin x + 5\sqrt{1-x^2} + C.$

1.3. $\int \frac{8-13x}{\sqrt{x^2-1}}dx.$ **Жауабы:** $8\ln\left|x+\sqrt{x^2-1}\right|-13\sqrt{x^2-1}+C.$

1.4. $\int \frac{6x+1}{2x^2-1}dx.$ **Жауабы:** $\frac{3}{2}\ln\left|2x^2-1\right|+\frac{\sqrt{2}}{4}\ln\left|\frac{\sqrt{2}x-1}{\sqrt{2}x+1}\right|+C.$

1.5. $\int \frac{x-2}{\sqrt{2-x^2}}dx.$ **Жауабы:** $-\sqrt{2-x^2}-2\arcsin\frac{x}{\sqrt{2}}+C.$

1.6. $\int \frac{3-7x}{\sqrt{1-4x^2}}dx.$ **Жауабы:** $\frac{3}{2}\arcsin 2x+\frac{7}{4}\sqrt{1-4x^2}+C.$

1.7. $\int \frac{5-3x}{\sqrt{2x^2+1}}dx.$ **Жауабы:** $\frac{5}{\sqrt{2}}\ln\left|\sqrt{2x}+\sqrt{2x^2+1}\right|-\frac{3}{2}\sqrt{2x^2+1}+C.$

1.8. $\int \frac{1+x}{\sqrt{2-x^2}}dx.$ **Жауабы:** $\arcsin\frac{x}{\sqrt{2}}-\sqrt{2-x^2}+C.$

1.9. $\int \frac{3x+2}{2x^2+1}dx.$ **Жауабы:** $\frac{3}{4}\ln\left|2x^2+1\right|+\sqrt{2}\operatorname{arctg}\sqrt{2}x+C.$

1.10. $\int \frac{1-5x}{1+25x^2}dx.$ **Жауабы:** $\frac{1}{5}\operatorname{arctg}5x-\frac{1}{10}\ln\left|1+25x^2\right|+C.$

1.11. $\int \frac{4x-3}{3x^2-4}dx.$ **Жауабы:** $\frac{2}{3}\ln\left|3x^2-4\right|-\frac{\sqrt{3}}{4}\ln\left|\frac{\sqrt{3}x-2}{\sqrt{3}x+2}\right|+C.$

1.12. $\int \frac{5x+1}{\sqrt{x^2-6}}dx.$ **Жауабы:** $5\sqrt{x^2-6}+\ln\left|x+\sqrt{x^2-6}\right|+C.$

1.13. $\int \frac{x-3}{9x^2+7}dx.$ **Жауабы:** $\frac{1}{18}\ln\left|9x^2+7\right|-\frac{1}{\sqrt{7}}\operatorname{arctg}\frac{3x}{\sqrt{7}}+C.$

1.14. $\int \frac{5-3x}{\sqrt{4-3x^2}}dx.$ **Жауабы:** $\frac{5}{\sqrt{3}}\arcsin\frac{\sqrt{3}x}{2}+\sqrt{4-3x^2}+C.$

1.15. $\int \frac{4-2x}{\sqrt{1-4x^2}}dx.$ **Жауабы:** $2\arcsin 2x+\frac{1}{2}\sqrt{1-4x^2}+C.$

1.16. $\int \frac{5-x}{2+x^2}dx.$ **Жауабы:** $\frac{5}{\sqrt{2}}\operatorname{arctg}\frac{x}{\sqrt{2}}-\frac{1}{2}\ln\left|2+x^2\right|+C.$

1.17. $\int \frac{1+3x}{\sqrt{1+4x^2}}dx.$ **Жауабы:** $\frac{1}{2}\ln\left|2x+\sqrt{1+4x^2}\right|+\frac{3}{4}\sqrt{1+4x^2}+C.$)

1.18. $\int \frac{5-4x}{\sqrt{1-x^2}}dx.$ **Жауабы:** $5\arcsin x+4\sqrt{1-x^2}+C.$

1.19. $\int \frac{5x-1}{\sqrt{x^2-3}}dx.$ **Жауабы:** $5\sqrt{x^2-3}-\ln\left|x+\sqrt{x^2-3}\right|+C.$

1.20. $\int \frac{1-3x}{4x^2-1}dx.$ **Жауабы:** $\frac{1}{4}\ln\left|\frac{2x-1}{2x+1}\right|-\frac{3}{8}\ln\left|4x^2-1\right|+C.$

1.21. $\int \frac{x-5}{3-2x^2}dx.$ **Жауабы:** $-\frac{1}{4}\ln\left|3-2x^2\right|+\frac{5}{2\sqrt{6}}\ln\left|\frac{\sqrt{2}x-\sqrt{3}}{\sqrt{2}x+\sqrt{3}}\right|+C.$

1.22. $\int \frac{x+4}{\sqrt{9-x^2}}dx.$ **Жауабы:** $-\sqrt{9-x^2}+4\arcsin\frac{x}{3}+C.$

1.23. $\int \frac{2x-7}{x^2-5}dx.$ **Жауабы:** $\ln\left|x^2-5\right|-\frac{7}{2\sqrt{5}}\ln\left|\frac{x-\sqrt{5}}{x+\sqrt{5}}\right|+C.$

1.24. $\int \frac{7x-2}{\sqrt{x^2-1}}dx.$ **Жауабы:** $7\sqrt{x^2-1}-2\ln\left|x+\sqrt{x^2-1}\right|+C.$

1.25. $\int \frac{1+3x}{\sqrt{x^2+1}}dx.$ **Жауабы:** $\ln\left|x+\sqrt{x^2+1}\right|+3\sqrt{x^2+1}+C.$

1.26. $\int \frac{x-5}{x^2+7}dx.$ **Жауабы:** $\frac{1}{2}\ln\left|x^2+7\right|-\frac{5}{\sqrt{7}}\operatorname{arctg}\frac{x}{\sqrt{7}}+C.$

1.27. $\int \frac{3-7x}{1+x^2}dx.$ **Жауабы:** $3\operatorname{arctg}x-\frac{7}{2}\ln\left|1+x^2\right|+C.$

1.28. $\int \frac{8-2x}{1+3x^2}dx.$ **Жауабы:** $\frac{1}{\sqrt{3}}\operatorname{arctg}\sqrt{3}x-\frac{1}{3}\ln\left|1+3x^2\right|+C.$

1.29. $\int \frac{3x+7}{\sqrt{x^2+4}}dx.$ **Жауабы:** $3\sqrt{x^2+4}+7\ln\left|x+\sqrt{x^2+4}\right|+C.$

1.30. $\int \frac{2x-1}{\sqrt{3x^2-4}}dx.$ **Жауабы:** $\frac{2}{3}\sqrt{3x^2-4}-\frac{1}{\sqrt{3}}\ln\left|\sqrt{3}x+\sqrt{3x^2-4}\right|+C.$

2.

2.1. $\int \frac{\sin 2x}{1+3\cos 2x}dx.$ **Жауабы:** $-\frac{1}{6}\ln\left|1+3\cos 2x\right|+C.$

2.2. $\int \frac{3x^3}{1-x^4}dx.$ **Жауабы:** $-\frac{3}{4}\ln\left|1-x^4\right|+C.$

2.3. $\int \frac{\sin 3x}{3-\cos 3x}dx.$ **Жауабы:** $\frac{1}{3}\ln\left|3-\cos 3x\right|+C.$

2.4. $\int \frac{e^x}{2e^x+3}dx.$ **Жауабы:** $\frac{1}{2}\ln\left|2e^x+3\right|+C.$

2.5. $\int \frac{\sin 2x}{\cos^2 x-4}dx.$ **Жауабы:** $-\ln\left|\cos^2 x-4\right|+C.$

2.6. $\int \frac{e^x}{4-3e^x}dx.$ **Жауабы:** $-\frac{1}{3}\ln\left|4-3e^x\right|+C.$

2.7. $\int \frac{x^2}{7-5x^3}dx.$ **Жауабы:** $-\frac{1}{15}\ln\left|7-5x^3\right|+C.$

2.8. $\int \frac{\sin 2x}{3\sin^2 x+4}dx.$ **Жауабы:** $\frac{1}{3}\ln\left|3\sin^2 x+4\right|+C.$

2.9. $\int \frac{e^{2x}}{5+e^{2x}}dx.$ **Жауабы:** $\frac{1}{2}\ln\left|5+e^{2x}\right|+C.$

2.10. $\int \frac{4x^3}{7+2x^4}dx.$ **Жауабы:** $\frac{1}{2}\ln\left|7+2x^4\right|+C.$

2.11. $\int \frac{4x-5}{2x^2-5x+17}dx.$ **Жауабы:** $\ln\left|2x^2-5x+17\right|+C.$

2.12. $\int \frac{7x^3}{2x^4-5}dx.$ **Жауабы:** $\frac{7}{8}\ln\left|2x^4-5\right|+C.$

2.13. $\int \frac{\cos 3x}{\sqrt{\sin 3x-2}}dx.$ **Жауабы:** $\frac{2}{3}\sqrt{\sin 3x-2}+C.$

2.14. $\int \frac{\sin 2x}{\sqrt{1+\cos^2 x}}dx.$ **Жауабы:** $-2\sqrt{1+\cos^2 x}+C.$

2.15. $\int \frac{\sin x}{1+3\cos x}dx.$ **Жауабы:** $-\frac{1}{3}\ln\left|1+3\cos x\right|+C.$

2.16. $\int \frac{\sin 2x}{4-\sin^2 x}dx.$ **Жауабы:** $-\ln\left|4-\sin^2 x\right|+C.$

2.17. $\int \frac{e^{3x}}{e^{3x}-5}dx.$ **Жауабы:** $\frac{1}{3}\ln\left|e^{3x}-5\right|+C.$

2.18. $\int \frac{x^2}{7+3x^3}dx.$ **Жауабы:** $\frac{1}{9}\ln\left|7+3x^3\right|+C.$

2.19. $\int \frac{3x+3}{x^2+2}dx.$ **Жауабы:** $\frac{3}{2}\ln\left|x^2+2\right|+C.$

2.20. $\int \frac{e^{2x}}{\sqrt{e^{2x}+3}}dx.$ **Жауабы:** $\sqrt{e^{2x}+3}+C.$

2.21. $\int \frac{3x^2+1}{x^3+x-10}dx.$ **Жауабы:** $\ln\left|x^3+x-10\right|+C.$

2.23. $\int \frac{x^4}{\sqrt{x^5+3}}dx.$ **Жауабы:** $\frac{2}{5}\sqrt{x^5+3}+C.$

2.24. $\int \frac{3x^2-2}{\sqrt{2x^3-4x}}dx.$ **Жауабы:** $\sqrt{2x^3-4x}+C.$

2.25. $\int \frac{\cos 7x}{\sqrt{5-\sin 7x}}dx.$ **Жауабы:** $-\frac{2}{7}\sqrt{5-\sin 7x}+C.$

2.26. $\int \frac{\sin 4x}{\sqrt{\cos 4x+3}}dx.$ **Жауабы:** $-\frac{1}{2}\sqrt{\cos 4x+3}+C.$

2.27. $\int \frac{12x^2+5x^4}{4x^3+x^5}dx.$ **Жауабы:** $\ln\left|4x^3+x^5\right|+C.$

2.28. $\int \frac{4e^{2x}}{\sqrt{1-e^{2x}}}dx.$ **Жауабы:** $-4\sqrt{1-e^{2x}}+C.$

2.29. $\int \frac{\sin 2x}{\sqrt{6-\cos^2 x}}dx.$ **Жауабы:** $2\sqrt{6-\cos^2 x}+C.$

2.30. $\int \frac{7x}{\sqrt{5x^2-4}}dx.$ **Жауабы:** $\frac{7}{5}\sqrt{5x^2-4}+C.$

3.

3.1. $\int \frac{1-2x-x^3}{1+x^2}dx.$ **Жауабы:** $-\frac{x^2}{2}-\frac{1}{2}\ln\left|x^2+1\right|+\operatorname{arctg}x+C.$

3.2. $\int \frac{7-x^2}{1-x}dx.$ **Жауабы:** $\frac{x^2}{2}+x-6\ln\left|1-x\right|+C.$

3.3. $\int \frac{x^3+2}{x^2-1}dx.$ **Жауабы:** $\frac{x^2}{2}+\frac{1}{2}\ln\left|x^2-1\right|+\ln\left|\frac{x-1}{x+1}\right|+C.$

3.4. $\int \frac{8x^3-1}{2x+1}dx.$ **Жауабы:** $\frac{4}{3}x^3-x^2+x-\ln\left|2x+1\right|+C.$

3.5. $\int \frac{x^5-2}{x^2-4}dx.$ **Жауабы:** $\frac{1}{4}x^4+2x^2+8\ln\left|x^2-4\right|-\frac{1}{2}\ln\left|\frac{x-2}{x+2}\right|+C.$

3.6. $\int \frac{2x^4-3}{x^2+1}dx.$ **Жауабы:** $\frac{2}{3}x^3-2x-\operatorname{arctg}x+C.$

3.7. $\int \frac{x^3-1}{2x+1}dx.$ **Жауабы:** $\frac{1}{6}x^3-\frac{1}{8}x^2+\frac{1}{8}x-\frac{9}{16}\ln\left|2x+1\right|+C.$

3.8. $\int \frac{x^5}{1-x^3}dx.$ **Жауабы:** $-\frac{1}{3}x^3-\frac{1}{3}\ln\left|1-x^3\right|+C.$

3.9. $\int \frac{x^2}{x^2+3}dx.$ **Жауабы:** $x-\sqrt{3}\operatorname{arctg}\frac{x}{\sqrt{3}}+C.$

3.10. $\int \frac{6x^3+x^2-2x+1}{2x-1}dx.$ **Жауабы:** $x^3+x^2+\frac{1}{2}\ln|2x-1|+C.$

3.11. $\int \frac{x^4}{x^2-3}dx.$ **Жауабы:** $\frac{x^3}{3}+3x+\frac{9}{2\sqrt{3}}\ln\left|\frac{x-\sqrt{3}}{x+\sqrt{3}}\right|+C.$

3.12. $\int \frac{x^3+5x}{x^2+1}dx.$ **Жауабы:** $\frac{x^2}{2}+2\ln|x^2+1|+C.$

3.13. $\int \frac{x^2-5x+6}{x^2+4}dx.$ **Жауабы:** $x-\frac{5}{2}\ln|x^2+4|+\operatorname{arctg}\frac{x}{2}+C.$

3.14. $\int \frac{x^3-1}{x+3}dx.$ **Жауабы:** $\frac{x^3}{3}-\frac{3}{2}x^2+9x-28\ln|x+3|+C.$

3.15. $\int \frac{x^3}{x^2-1}dx.$ **Жауабы:** $\frac{1}{2}x^2+\frac{1}{2}\ln|x^2-1|+C.$

3.16. $\int \frac{x^4+1}{x^2+1}dx.$ **Жауабы:** $\frac{1}{3}x^3-x+2\operatorname{arctg}x+C.$

3.17. $\int \frac{x^4-2x^2-1}{x^2+1}dx.$ **Жауабы:** $\frac{x^3}{3}-3x+2\operatorname{arctg}x+C.$

3.18. $\int \frac{x^4+2}{x^2-4}dx.$ **Жауабы:** $\frac{x^3}{3}+4x+\frac{9}{2}\ln\left|\frac{x-2}{x+2}\right|+C.$

3.19. $\int \frac{x^3-3}{x+5}dx.$ **Жауабы:** $\frac{x^3}{3}-\frac{5}{2}x^2+25x-128\ln|x+5|+C.$

3.20. $\int \frac{x^3+1}{x^2+1}dx.$ **Жауабы:** $\frac{1}{2}x^2-\frac{1}{2}\ln|x^2+1|+\operatorname{arctg}x+C.$

3.21. $\int \frac{1-2x^4}{x^2+1}dx.$ **Жауабы:** $-\frac{2}{3}x^3+2x-\operatorname{arctg}x+C.$

3.22. $\int \frac{2x^3-3}{x-2}dx.$ **Жауабы:** $\frac{2}{3}x^3+2x^2+8x+13\ln|x-2|+C.$

3.23. $\int \frac{2x^2+5}{x+1}dx.$ **Жауабы:** $2x+3\operatorname{arctg}x+C.$

3.24. $\int \frac{x^3+3x+1}{x^2+2}dx.$ **Жауабы:** $\frac{x^2}{2}+\frac{1}{2}\ln\left|x^2+2\right|+\frac{1}{\sqrt{2}}\operatorname{arctg}\frac{x}{\sqrt{2}}+C.$

3.25. $\int \frac{x^2+x}{2-x}dx.$ **Жауабы:** $-\frac{x^2}{2}-3x-6\ln\left|x-2\right|+C.$

3.26. $\int \frac{2x^2+5}{x-7}dx.$ **Жауабы:** $x^2+14x+103\ln\left|x-7\right|+C.$

3.27. $\int \frac{2x^3+3}{x-1}dx.$ **Жауабы:** $\frac{2}{3}x^3+x^2+2x+5\ln\left|x-1\right|+C.$

3.28. $\int \frac{1-x^4}{x^2+4}dx.$ **Жауабы:** $-\frac{x^3}{3}+4x-\frac{15}{2}\operatorname{arctg}\frac{x}{2}+C.$

3.29. $\int \frac{x^2+4}{x-3}dx.$ **Жауабы:** $\frac{x^2}{2}+3x+13\ln\left|x-3\right|+C.$

3.30. $\int \frac{2x^2+3}{2x^2-1}dx.$ **Жауабы:** $x+\sqrt{2}\ln\left|\frac{\sqrt{2}x-1}{\sqrt{2}x+1}\right|+C.$

4.

4.1. $\int \sin^2(1-x)dx.$ **Жауабы:** $\frac{1}{2}x+\frac{1}{4}\sin 2(1-x)+C.$

4.2. $\int \sin^3(1-x)dx.$ **Жауабы:** $\cos(1-x)-\frac{1}{3}\cos^3(1-x)+C.$

4.3. $\int\left(1-2\sin\frac{x}{5}\right)^2dx.$ **Жауабы:** $3x+20\cos\frac{x}{5}-5\sin\frac{2x}{5}+C.$

4.4. $\int \cos 5x\sin^3 5x\,dx.$ **Жауабы:** $-\frac{1}{20}\cos^4 5x+C.$

4.5. $\int \cos^3(1-x)dx.$ **Жауабы:** $-\sin(1-x)+\frac{1}{3}\sin^3(1-x)+C.$

4.6. $\int(3-\sin 2x)^2 dx.$ **Жауабы:** $\frac{19}{2}x+3\cos 2x-\frac{1}{8}\sin 4x+C.$

4.7. $\int \sin^2 \frac{3x}{2} dx.$ **Жауабы:** $\frac{1}{2}x-\frac{1}{6}\sin 3x+C.$

4.8. $\int(\ \cos x+3\ )^2 dx.$ **Жауабы:** $\frac{19}{2}x+6\sin x+C.$

4.9. $\int \cos^3(x+3)dx.$ **Жауабы:** $\sin(x+3)-\frac{1}{3}\sin^3(x+3)+C.$

4.10. $\int \sin^3 \frac{4x}{5} dx.$ **Жауабы:** $-\frac{5}{4}\cos\frac{4x}{5}+\frac{5}{12}\cos^3\frac{4x}{5}+C.$

4.11. $\int(1-\cos x)^2 dx.$ **Жауабы:** $\frac{3}{2}x-2\sin x+\frac{1}{4}\sin 2x+C.$

4.12. $\int \sin^2(2x-1)dx.$ **Жауабы:** $\frac{x}{2}-\frac{1}{8}\sin(4x-2)+C.$

4.13. $\int \sin^3 6x dx.$ **Жауабы:** $-\frac{1}{6}\cos 6x+\frac{1}{18}\cos^3 6x+C.$

4.14. $\int \sin^2(0,5x)dx.$ **Жауабы:** $\frac{1}{2}x-\frac{1}{2}\sin x+C.$

4.15. $\int \sin^2\left(\frac{x}{2}+1\right)dx.$ **Жауабы:** $\frac{1}{2}x-\frac{1}{2}\sin(x+2)+C.$

4.16. $\int \cos^2 2x dx.$ **Жауабы:** $\frac{1}{2}x+\frac{1}{8}\sin 4x+C.$

4.17. $\int\left(1+\cos\frac{x}{2}\right)^2 dx.$ **Жауабы:** $3x+8\sin\frac{x}{2}+2\sin x+C.$

4.18. $\int \cos^2 3x dx.$ **Жауабы:** $(\frac{1}{2}x+\frac{1}{12}\sin 6x+C.$

4.19. $\int \sin^4 2x dx.$ **Жауабы:** $\frac{3}{8}x-\frac{1}{8}\sin 4x+\frac{1}{64}\sin 8x+C.$

4.20. $\int \sin^2 3x dx.$ **Жауабы:** $\frac{1}{2}x-\frac{1}{12}\sin 6x+C.$

4.21. $\int (1-\cos 3x)^2\,dx.$ **Жауабы:** $\frac{3}{2}x-\frac{2}{3}\sin 3x+\frac{1}{12}\sin 6x+C.$

4.22. $\int \cos^2\frac{2x}{5}\,dx.$ **Жауабы:** $\frac{1}{2}x+\frac{5}{8}\sin\frac{4x}{5}+C.$

4.23. $\int \sin^3 5x\,dx.$ **Жауабы:** $-\frac{1}{5}\cos 5x+\frac{1}{15}\cos^3 5x+C.$

4.24. $\int \sin^4 x\,dx.$ **Жауабы:** $\frac{3}{8}x-\frac{1}{4}\sin 2x+\frac{1}{32}\sin 4x+C.$

4.25. $\int \cos^4 x\,dx.$ **Жауабы:** $\frac{3}{8}x+\frac{1}{4}\sin 2x+\frac{1}{32}\sin 4x+C.$

4.26. $\int \cos^3 4x\,dx.$ **Жауабы:** $\frac{1}{4}\sin 4x-\frac{1}{12}\sin^3 4x+C.$

4.27. $\int \cos^2 7x\,dx.$ **Жауабы:** $\frac{1}{2}x+\frac{1}{28}\sin 14x+C.$

4.28. $\int (\sin x-5)^2\,dx.$ **Жауабы:** $\frac{51}{2}x-\frac{1}{4}\sin 2x+10\cos x+C.$

4.29. $\int \sin^3 4x\,dx.$ **Жауабы:** $-\frac{1}{4}\cos 4x+\frac{1}{12}\cos^3 4x+C.$

4.30. $\int \sin^2\frac{3x}{4}\,dx.$ **Жауабы:** $\frac{1}{2}x-\frac{1}{3}\sin\frac{3x}{2}+C.$

5.

5.1. $\int \operatorname{tg}^2 x\,dx.$ **Жауабы:** $\operatorname{tg}x-x+C.$

5.2. $\int \operatorname{ctg}^3(x-6)\,dx.$ **Жауабы:** $-\frac{1}{2}\operatorname{ctg}^2(x-6)-\ln\left|\sin(x-6)\right|+C.$

5.3. $\int \operatorname{tg}^4 3x\,dx.$ **Жауабы:** $\frac{1}{9}\operatorname{tg}^3 3x-\frac{1}{3}\operatorname{tg}3x+x+C.$

5.4. $\int \operatorname{tg}^2 7x\,dx.$ **Жауабы:** $\frac{1}{7}\operatorname{tg}7x-x+C.$

5.5. $\int \operatorname{tg}^5 x\,dx.$ **Жауабы:** $\frac{1}{4}\operatorname{tg}^4 x - \frac{1}{2}\operatorname{tg}^2 x - \ln\left|\cos x\right| + C.$

5.6. $\int x\operatorname{tg}^2 x^2\,dx.$ **Жауабы:** $\frac{1}{2}\operatorname{tg} x^2 - \frac{1}{2}x^2 + C.$

5.7. $\int \operatorname{ctg}^3 x\,dx.$ **Жауабы:** $-\frac{1}{2}\operatorname{ctg}^2 x - \ln\left|\sin x\right| + C.$

5.8. $\int \operatorname{tg}^2 \frac{x}{2}\,dx.$ **Жауабы:** $2\operatorname{tg}\frac{x}{2} - x + C.$

5.9. $\int \operatorname{tg}^3 \frac{x}{2}\,dx.$ **Жауабы:** $\operatorname{tg}^2 \frac{x}{2} + 2\ln\left|\cos\frac{x}{2}\right| + C.$

5.10. $\int \operatorname{tg}^2 4x\,dx.$ **Жауабы:** $\frac{1}{4}\operatorname{tg} 4x - x + C.$

5.11. $\int \operatorname{ctg}^3 x dx.$ **Жауабы:** $-\frac{1}{2}\operatorname{ctg}^2 x - \ln\left|\sin x\right| + C.$

5.12. $\int \operatorname{ctg}^2 5x\,dx.$ **Жауабы:** $-\frac{1}{5}\operatorname{ctg} 5x - x + C.$

5.13. $\int \operatorname{tg}^3 \frac{x}{3}\,dx.$ **Жауабы:** $\frac{3}{2}\operatorname{tg}^2 \frac{x}{3} + 3\ln\left|\cos\frac{x}{3}\right| + C.$

5.14. $\int \left(1 - \operatorname{tg} 2x\right)^2 dx.$ **Жауабы:** $\ln\left|\cos 2x\right| + \frac{1}{2}\operatorname{tg} 2x + C.$

5.15. $\int \operatorname{tg}^5 2x\,dx.$ **Жауабы:** $\frac{1}{8}\operatorname{tg}^4 2x - \frac{1}{4}\operatorname{tg}^2 2x - \frac{1}{2}\ln\left|\cos 2x\right| + C.$

5.16. $\int \left(2x + \operatorname{tg}^2 7x\right)dx.$ **Жауабы:** $x^2 + \frac{1}{7}\operatorname{tg} 7x - x + C.$

5.17. $\int \operatorname{tg}^4 \frac{2x}{3}\,dx.$ **Жауабы:** $\frac{1}{2}\operatorname{tg}^3 \frac{2x}{3} - \frac{3}{2}\operatorname{tg}\frac{2x}{3} + x + C.$

5.18. $\int \left(\operatorname{tg} 2x + \operatorname{ctg} 2x\right)^2 dx.$ **Жауабы:** $\frac{1}{2}\operatorname{tg} 2x - \frac{1}{2}\operatorname{ctg} 2x + C.$

5.19. $\int \left(1 - \operatorname{ctg} x\right)^2 dx.$ **Жауабы:** $-2\ln\left|\sin x\right| - \operatorname{ctg} x + C.$

5.20. $\int \operatorname{ctg}^3 3x\,dx.$ **Жауабы:** $-\frac{1}{6}\operatorname{ctg}^2 3x-\frac{1}{3}\ln\left|\sin 3x\right|+C.$

5.21. $\int \operatorname{ctg}^4 x\,dx.$ **Жауабы:** $-\frac{1}{3}\operatorname{ctg}^3 x+\operatorname{ctg} x+x+C.$

5.22. $\int \operatorname{tg}^2 \frac{x}{2}\,dx.$ **Жауабы:** $2\operatorname{tg}\frac{x}{2}-x+C.$

5.23. $\int \operatorname{tg}^4 (x-6)\,dx.$ **Жауабы:** $\frac{1}{3}\operatorname{tg}^3 (x-6)-\operatorname{tg}(x-6)+x+C.$

5.24. $\int \operatorname{tg}^3 4x\,dx.$ **Жауабы:** $\frac{1}{8}\operatorname{tg}^2 4x+\frac{1}{4}\ln\left|\cos 4x\right|+C.$

5.25 $\int \operatorname{tg}^4 \frac{x}{4}\,dx.$ **Жауабы:** $\frac{4}{3}\operatorname{tg}^3 \frac{x}{4}-4\operatorname{tg}\frac{x}{4}+x+C.$

5.26. $\int \operatorname{tg}^4 (x+5)\,dx.$ **Жауабы:** $\frac{\operatorname{tg}^3 (x+5)}{3}-\operatorname{tg}(x+5)+x+C.$

5.27. $\int \operatorname{tg}^3 (x-3)\,dx.$ **Жауабы:** $\frac{1}{2}\operatorname{tg}^2 (x-3)+\ln\left|\cos(x-3)\right|+C.$

5.28. $\int \operatorname{tg}^2 (5x+1)\,dx.$ **Жауабы:** $\frac{1}{5}\operatorname{tg}(5x+1)-x+C.$

5.29. $\int \operatorname{tg}^2 \frac{7x}{4}\,dx.$ **Жауабы:** $\frac{4}{7}\operatorname{tg}\frac{7x}{4}-x+C.$

5.30. $\int \operatorname{tg}^5 4x\,dx.$ **Жауабы:** $\frac{1}{16}\operatorname{tg}^4 4x-\frac{1}{8}\operatorname{tg}^2 4x-\frac{1}{4}\ln\left|\cos 4x\right|+C.$

6.

6.1. $\int \sin 3x\cos x\,dx.$ **Жауабы:** $-\frac{1}{8}\cos 4x-\frac{1}{4}\cos 2x+C.$

6.2. $\int \sin^5 2x\cos 2x\,dx.$ **Жауабы:** $\frac{1}{12}\sin^6 2x+C.$

6.3. $\int \sin^2 3x\cos 3x\,dx.$ **Жауабы:** $\frac{1}{9}\sin^3 3x+C.$

6.4. $\int \cos^3 5x \sin 5x dx.$ **Жауабы:** $-\frac{1}{20}\cos^4 5x + C.$

6.5. $\int \sin\frac{x}{2}\cos\frac{x}{4}dx.$ **Жауабы:** $-\frac{2}{3}\cos\frac{3x}{4} - 2\cos\frac{x}{4} + C.$

6.6. $\int \cos x \sin 9x dx.$ **Жауабы:** $\frac{1}{20}\cos 10x - \frac{1}{16}\cos 8x + C.$

6.7. $\int \sin^4 2x \cos 2x dx.$ **Жауабы:** $\frac{1}{10}\sin^5 2x + C.$

6.8. $\int \sin\frac{x}{2}\cos\frac{3x}{2}dx.$ **Жауабы:** $-\frac{1}{4}\cos 2x + \frac{1}{2}\cos x + C.$

6.9. $\int \cos^5 x \sin x dx.$ **Жауабы:** $-\frac{1}{6}\cos^6 x + C.$

6.10. $\int \cos 2x \sin 3x dx.$ **Жауабы:** $\frac{1}{10}\sin 5x + \frac{1}{2}\sin x + C.$

6.11. $\int \sin 5x \sin 7x dx.$ **Жауабы:** $\frac{1}{4}\sin 2x - \frac{1}{24}\sin 12x + C.$

6.12. $\int \sin 4x \cos 2x dx.$ **Жауабы:** $-\frac{1}{12}\cos 6x - \frac{1}{4}\cos 2x + C.$

6.13. $\int \cos^3 4x \sin 4x dx.$ **Жауабы:** $-\frac{1}{16}\cos^4 4x + C.$

6.14. $\int \cos^{-3} 2x \sin 2x dx.$ **Жауабы:** $\frac{1}{4}\cos^{-2} 2x + C.$

6.15. $\int \cos x \sin 9x dx.$ **Жауабы:** $\frac{1}{20}\cos 10x - \frac{1}{16}\cos 8x + C.$

6.16. $\int \sin 4x \cos 2x dx.$ **Жауабы:** $-\frac{1}{12}\cos 6x - \frac{1}{4}\cos 2x + C.$

6.17. $\int \sin 3x \cos 2x dx.$ **Жауабы:** $-\frac{1}{10}\cos 5x - \frac{1}{2}\cos x + C.$

6.18. $\int \sin^3 7x \cos 7x dx.$ **Жауабы:** $\frac{1}{28}\sin^4 7x + C.$

6.19. $\int \frac{\sin x}{\cos^3 x} dx.$ **Жауабы:** $\frac{1}{2}\cos^{-2} x + C.$

6.20. $\int \frac{\cos 2x}{\sin^4 2x} dx.$ **Жауабы:** $\frac{1}{6\sin^3 2x} + C.$

6.21. $\int \cos 2x \cos 5x dx.$ **Жауабы:** $\frac{1}{6}\sin 3x + \frac{1}{14}\sin 7x + C.$)

6.22. $\int \sin^2 2x \cos x dx.$ **Жауабы:** $\frac{4}{3}\sin^3 x - \frac{4}{5}\sin^5 x + C.$

6.23. $\int \frac{\cos x}{\sin^4 x} dx.$ **Жауабы:** $-\frac{1}{3\sin^3 x} + C.$

6.24. $\int \sin 2x \sin 3x dx.$ **Жауабы:** $\frac{1}{2}\sin x - \frac{1}{10}\sin 5x + C.$

6.25. $\int \sin x \cos^3 x dx.$ **Жауабы:** $-\frac{\cos^4 x}{4} + C.$

6.26. $\int \sin 5x \cos x dx.$ **Жауабы:** $\frac{1}{12}\cos 6x - \frac{1}{8}\cos 4x + C.$

6.27. $\int \sin x \cos 4x dx.$ **Жауабы:** $-\frac{1}{10}\cos 5x + \frac{1}{6}\cos 3x + C.$

6.28. $\int \cos 3x \cos x dx.$ **Жауабы:** $\frac{1}{4}\sin 2x + \frac{1}{8}\sin 4x + C.$

6.29. $\int \cos^4 2x \sin 2x dx.$ **Жауабы:** $-\frac{1}{10}\cos^5 2x + C.$

6.30. $\int \cos 7x \cos 5x dx.$ **Жауабы:** $\frac{1}{4}\sin 2x - \frac{1}{24}\sin 12x + C.$

7.

7.1. $\int \frac{dx}{4x^2 - 5x + 4}.$ **Жауабы:** $\frac{2}{\sqrt{39}}\operatorname{arctg}\frac{8x-5}{\sqrt{39}} + C.$

7.2. $\int \frac{dx}{x^2+4x+10}$. **Жауабы:** $\frac{1}{\sqrt{6}}\operatorname{arctg}\frac{x+2}{\sqrt{6}}+C$.

7.3. $\int \frac{dx}{2x^2-7x+1}$. **Жауабы:** $\frac{1}{\sqrt{41}}\ln\left|\frac{4x-7-\sqrt{41}}{4x-7+\sqrt{41}}\right|+C$.

7.4. $\int \frac{dx}{2x^2+x-6}$. **Жауабы:** $\frac{1}{7}\ln\left|\frac{2x-3}{2x+4}\right|+C$.

7.5. $\int \frac{dx}{5x^2+2x+7}$. **Жауабы:** $\frac{1}{\sqrt{34}}\operatorname{arctg}\frac{5x+1}{\sqrt{34}}+C$.

7.6. $\int \frac{dx}{2x^2-2x+1}$. **Жауабы:** $\operatorname{arctg}(2x-1)+C$.

7.7. $\int \frac{dx}{2x^2-11x+2}$. **Жауабы:** $\frac{1}{\sqrt{105}}\ln\left|\frac{4x-11-\sqrt{105}}{4x-11+\sqrt{105}}\right|+C$.

7.8. $\int \frac{dx}{2x^2+x+2}$. **Жауабы:** $\frac{2}{\sqrt{15}}\operatorname{arctg}\frac{4x+1}{\sqrt{15}}+C$.

7.9. $\int \frac{dx}{3x^2-12x+3}$. **Жауабы:** $\frac{1}{6\sqrt{3}}\ln\left|\frac{x-2-\sqrt{3}}{x-2+\sqrt{3}}\right|+C$.

7.10. $\int \frac{dx}{2x^2+3x}$. **Жауабы:** $\frac{1}{3}\ln\left|\frac{x}{x+\frac{3}{2}}\right|+C$.

7.11. $\int \frac{dx}{x^2-5x+6}$. **Жауабы:** $\ln\left|\frac{x-3}{x-2}\right|+C$.

7.12. $\int \frac{dx}{2x-3-4x^2}$. **Жауабы:** $-\frac{1}{\sqrt{11}}\operatorname{arctg}\frac{4x-1}{\sqrt{11}}+C$.

7.13. $\int \frac{dx}{3x^2-8x-3}$. **Жауабы:** $\frac{1}{10}\ln\left|\frac{3x-9}{3x+1}\right|+C$.

7.14. $\int \frac{dx}{8-2x-x^2}$. **Жауабы:** $-\frac{1}{6}\ln\left|\frac{x-2}{x+4}\right|+C$.

7.15. $\int \frac{dx}{5x-x^2-6}$. **Жауабы:** $-\ln\left|\frac{x-3}{x-2}\right|+C$.

7.16. $\int \frac{dx}{x^2+4x+25}$. **Жауабы:** $\frac{1}{\sqrt{21}}\operatorname{arctg}\frac{x+2}{\sqrt{21}}+C$.

7.17. $\int \frac{dx}{2x^2-8x+30}$. **Жауабы:** $\frac{1}{2\sqrt{11}}\operatorname{arctg}\frac{x-2}{\sqrt{11}}+C$.

7.18. $\int \frac{dx}{3x^2-9x+6}$. **Жауабы:** $\frac{1}{3}\ln\left|\frac{x-2}{x-1}\right|+C$.

7.19. $\int \frac{dx}{2x^2-2x+5}$. **Жауабы:** $\frac{1}{3}\operatorname{arctg}\frac{2x-1}{3}+C$.

7.20. $\int \frac{dx}{2x^2-3x-2}$. **Жауабы:** $\frac{1}{5}\operatorname{arctg}\frac{2x-4}{2x+1}+C$.

7.21. $\int \frac{dx}{2x^2-6x+1}$. **Жауабы:** $\frac{1}{2\sqrt{7}}\ln\left|\frac{2x-3-\sqrt{7}}{2x-3+\sqrt{7}}\right|+C$.

7.22. $\int \frac{dx}{2x^2-3x+2}$. **Жауабы:** $\frac{2}{\sqrt{7}}\operatorname{arctg}\frac{4x-3}{\sqrt{7}}+C$.

7.23. $\int \frac{dx}{x^2+7x+11}$. **Жауабы:** $\frac{1}{\sqrt{5}}\ln\left|\frac{2x+7-\sqrt{5}}{2x+7+\sqrt{5}}\right|+C$.

7.24. $\int \frac{dx}{2x^2-3x+1}$. **Жауабы:** $\ln\left|\frac{2x-2}{2x-1}\right|+C$.

7.25. $\int \frac{dx}{5x^2-10x+25}$. **Жауабы:** $\frac{1}{10}\operatorname{arctg}\frac{x-1}{2}+C$.

7.26. $\int \frac{dx}{2x^2+6x+3}$. **Жауабы:** $\frac{1}{2\sqrt{3}}\ln\left|\frac{2x+3-\sqrt{3}}{2x+3+\sqrt{3}}\right|+C$.

7.27. $\int \frac{dx}{x^2-6x+8}$. **Жауабы:** $\frac{1}{2}\ln\left|\frac{x-4}{x-2}\right|+C$.

7.28. $\int \frac{dx}{1-2x-3x^2}$. **Жауабы:** $-\frac{1}{4}\ln\left|\frac{3x-1}{3x+3}\right|+C$.

7.29. $\int \frac{dx}{2x^2+3x+6}$. **Жауабы:** $\frac{2}{\sqrt{39}}\operatorname{arctg}\frac{4x+3}{\sqrt{39}}+C$.

7.30. $\int \frac{dx}{3x^2+5x+1}$. **Жауабы:** $\frac{1}{\sqrt{13}}\ln\left|\frac{6x+5-\sqrt{13}}{6x+5+\sqrt{13}}\right|+C$.

8.

8.1. $\int \frac{dx}{\sqrt{4+8x-x^2}}$. **Жауабы:** $\arcsin\frac{x-4}{\sqrt{20}}+C$.

8.2. $\int \frac{dx}{\sqrt{3x^2-4x+1}}$. **Жауабы:** $\frac{1}{\sqrt{3}}\ln\left|x-\frac{2}{3}+\sqrt{x^2-\frac{4}{3}x+\frac{1}{3}}\right|+C$.

8.3. $\int \frac{dx}{\sqrt{2-3x-2x^2}}$. **Жауабы:** $\frac{1}{\sqrt{2}}\arcsin\frac{4x+3}{5}+C$.

8.4. $\int \frac{dx}{\sqrt{x^2+6x+8}}$. **Жауабы:** $\ln\left|x+3+\sqrt{x^2+6x+8}\right|+C$.

8.5. $\int \frac{dx}{\sqrt{2+8x-2x^2}}$. **Жауабы:** $\frac{1}{\sqrt{2}}\arcsin\frac{x-2}{\sqrt{5}}+C$.

8.6. $\int \frac{dx}{\sqrt{3+2x-2x^2}}$. **Жауабы:** $\frac{1}{\sqrt{2}}\arcsin\frac{2x-1}{\sqrt{7}}+C$.

8.7. $\int \frac{dx}{\sqrt{2-2x-3x^2}}$. **Жауабы:** $\frac{1}{\sqrt{3}}\arcsin\frac{3x+1}{\sqrt{7}}+C$.

8.8. $\int \frac{dx}{\sqrt{1+x-x^2}}$. **Жауабы:** $\arcsin\frac{2x-1}{\sqrt{5}}+C$.

8.9. $\int \frac{dx}{\sqrt{5x^2-10x+4}}$. **Жауабы:** $\frac{1}{\sqrt{5}}\ln\left|x-1+\sqrt{x^2-2x+\frac{4}{5}}\right|+C$.

8.10. $\int \frac{dx}{\sqrt{2x+3-x^2}}$. **Жауабы:** $\arcsin\frac{x-1}{2}+C$.

8.11. $\int \frac{dx}{\sqrt{4x^2-8x+3}}$. **Жауабы:** $\frac{1}{2}\ln\left|x-1+\sqrt{x^2-2x+\frac{3}{4}}\right|+C.$

8.12. $\int \frac{dx}{\sqrt{1+2x-x^2}}$. **Жауабы:** $\arcsin\frac{x-1}{\sqrt{2}}+C.$

8.13. $\int \frac{dx}{\sqrt{4x^2-x+4}}$. **Жауабы:** $\frac{1}{2}\ln\left|x-\frac{1}{8}+\sqrt{x^2-\frac{1}{4}x+1}\right|+C.$

8.14. $\int \frac{dx}{\sqrt{2+4x-3x^2}}$. **Жауабы:** $\frac{1}{\sqrt{3}}\arcsin\frac{3x-2}{\sqrt{10}}+C.$

8.15. $\int \frac{dx}{\sqrt{4x^2+2x+4}}$. **Жауабы:** $\frac{1}{2}\ln\left|x+\frac{1}{4}+\sqrt{x^2+\frac{1}{2}x+1}\right|+C.$

8.16. $\int \frac{dx}{\sqrt{3x+2-2x^2}}$. **Жауабы:** $\frac{1}{\sqrt{2}}\arcsin\frac{4x-3}{5}+C.$

8.17. $\int \frac{dx}{\sqrt{2x^2-8x+1}}$. **Жауабы:** $\frac{1}{\sqrt{2}}\ln\left|x-2+\sqrt{x^2-4x+\frac{1}{2}}\right|+C.$

8.18. $\int \frac{dx}{\sqrt{x^2-5x+6}}$. **Жауабы:** $\ln\left|x-\frac{5}{2}+\sqrt{x^2-5x+6}\right|+C.$

8.19. $\int \frac{dx}{\sqrt{3x-2x^2}}$. **Жауабы:** $\frac{1}{\sqrt{2}}\arcsin\frac{4x-3}{3}+C.$

8.20. $\int \frac{dx}{\sqrt{2x^2-x+3}}$. **Жауабы:** $\frac{1}{\sqrt{2}}\ln\left|x-\frac{1}{4}+\sqrt{x^2-\frac{1}{2}x+\frac{3}{2}}\right|+C.$

8.21. $\int \frac{dx}{\sqrt{2-x-2x^2}}$. **Жауабы:** $\frac{1}{\sqrt{2}}\arcsin\frac{4x+1}{\sqrt{17}}+C.$

8.22. $\int \frac{dx}{\sqrt{x^2+3x-1}}$. **Жауабы:** $\ln\left|x+\frac{3}{2}+\sqrt{x^2+3x-1}\right|+C.$

8.23. $\int \frac{dx}{\sqrt{5-7x-3x^2}}$. **Жауабы:** $\frac{1}{\sqrt{3}}\arcsin\frac{6x+7}{\sqrt{109}}+C.$

8.24. $\int \frac{dx}{\sqrt{3x^2-x+5}}$. **Жауабы:** $\frac{1}{\sqrt{3}}\ln\left|x-\frac{1}{6}+\sqrt{x^2-\frac{1}{3}x+\frac{5}{3}}\right|+C.$

8.25. $\int \frac{dx}{\sqrt{1-x-x^2}}$. **Жауабы:** $\arcsin\frac{2x+1}{\sqrt{5}}+C.$

8.26. $\int \frac{dx}{\sqrt{1-2x-x^2}}$. **Жауабы:** $\arcsin\frac{x+1}{\sqrt{2}}+C.$

8.27. $\int \frac{dx}{\sqrt{4-3x-x^2}}$. **Жауабы:** $\arcsin\frac{2x+3}{5}+C.$

8.28. $\int \frac{dx}{\sqrt{x^2+5x+1}}$. **Жауабы:** $\ln\left|x+\frac{5}{2}+\sqrt{x^2+5x+1}\right|+C.$

8.29. $\int \frac{dx}{\sqrt{3-x-x^2}}$. **Жауабы:** $\arcsin\frac{2x+1}{\sqrt{13}}+C.$

8.30. $\int \frac{dx}{\sqrt{x^2+4x+1}}$. **Жауабы:** $\ln\left|x+2+\sqrt{x^2+4x+1}\right|+C.$

9.

9.1. $\int \frac{x+1}{2x^2+3x-4}dx.$

(Жауабы: $\frac{1}{4}\ln\left|2x^2+3x-4\right|+\frac{1}{4\sqrt{41}}\ln\left|\frac{4x+3-\sqrt{41}}{4x+3+\sqrt{41}}\right|+C.$**)**

9.2. $\int \frac{x+6}{3x^2+x+1}dx.$

Жауабы: $\frac{1}{6}\ln\left|3x^2+x+1\right|+\frac{35}{3\sqrt{11}}\operatorname{arctg}\frac{6x+1}{\sqrt{11}}+C.$

9.3. $\int \frac{2x-1}{3x^2-2x+6}dx.$

Жауабы: $\frac{1}{3}\ln\left|3x^2-2x+6\right|-\frac{1}{3\sqrt{17}}\operatorname{arctg}\frac{3x-1}{\sqrt{17}}+C.$

9.4. $\int \frac{x}{2x^2+x+5}dx.$

Жауабы: $\frac{1}{4}\ln\left|2x^2+x+5\right|-\frac{1}{2\sqrt{39}}\operatorname{arctg}\frac{4x+1}{\sqrt{39}}+C.$

9.5. $\int \frac{x+5}{x^2+x-2}dx.$

Жауабы: $\frac{1}{2}\ln\left|x^2+x-2\right|+\frac{3}{2}\ln\left|\frac{x-1}{x+2}\right|+C.$

9.6. $\int \frac{3x-2}{5x^2-3x+2}dx.$

Жауабы: $\frac{3}{10}\ln\left|5x^2-3x+2\right|-\frac{11}{5\sqrt{31}}\operatorname{arctg}\frac{10x-3}{\sqrt{31}}+C.$

9.7. $\int \frac{x+4}{2x^2-6x-8}dx.$

Жауабы: $\frac{1}{4}\ln\left|2x^2-6x-8\right|+\frac{11}{20}\ln\left|\frac{x-4}{x+1}\right|+C.$

9.8. $\int \frac{x+4}{2x^2-7x+1}dx.$

Жауабы: $\frac{1}{4}\ln\left|2x^2-7x+1\right|+\frac{23}{4\sqrt{41}}\ln\left|\frac{4x-7-\sqrt{41}}{4x-7+\sqrt{41}}\right|+C.$

9.9. $\int \frac{5x-2}{2x^2-5x+2}dx.$

Жауабы: $\frac{5}{4}\ln\left|2x^2-5x+2\right|+\frac{17}{12}\ln\left|\frac{2x-4}{2x-1}\right|+C.$

9.10. $\int \frac{4x-1}{4x^2-4x+5}dx.$

Жауабы: $\frac{1}{2}\ln\left|4x^2-4x+5\right|+\frac{1}{4}\operatorname{arctg}\frac{2x-1}{2}+C.$

9.11. $\int \frac{x+1}{2x^2+x+1}dx.$

Жауабы: $\frac{1}{4}\ln\left|2x^2+x+1\right|+\frac{3}{2\sqrt{7}}\operatorname{arctg}\frac{4x+1}{\sqrt{7}}+C.$

9.12. $\int \frac{x+1}{3x^2-2x-3}dx.$

Жауабы: $\frac{1}{6}\ln\left|3x^2-2x-3\right|+\frac{2}{3\sqrt{10}}\ln\left|\frac{3x-1-\sqrt{10}}{3x-1+\sqrt{10}}\right|+C.$

9.13. $\int \frac{4x+8}{4x^2+6x-13}dx.$

Жауабы: $\frac{1}{2}\ln\left|4x^2+6x-13\right|+\frac{5}{2\sqrt{61}}\ln\left|\frac{4x+3-\sqrt{61}}{4x+3+\sqrt{61}}\right|+C.$

9.14. $\int \frac{5x+1}{x^2-4x+1}dx.$

Жауабы: $\frac{5}{2}\ln\left|x^2-4x+1\right|+\frac{11}{2\sqrt{3}}\ln\left|\frac{x-2-\sqrt{3}}{x-2+\sqrt{3}}\right|+C.$

9.15. $\int \frac{x}{2x^2+2x+5}dx.$

Жауабы: $\frac{1}{4}\ln\left|2x^2+2x+5\right|-\frac{1}{6}\operatorname{arctg}\frac{2x+1}{3}+C.$

9.16. $\int \frac{x-3}{x^2-5x+4}dx.$

Жауабы: $\frac{1}{2}\ln\left|x^2-5x+4\right|-\frac{1}{6}\ln\left|\frac{x-4}{x-1}\right|+C.$

9.17. $\int \frac{2x-1}{2x^2+8x-6}dx.$

Жауабы: $\frac{1}{2}\ln\left|2x^2+8x-6\right|-\frac{5}{4\sqrt{7}}\ln\left|\frac{x+2-\sqrt{7}}{x+2+\sqrt{7}}\right|+C.$

9.18. $\int \frac{2-x}{4x^2+16x-12}dx.$

Жауабы: $-\frac{1}{8}\ln\left|4x^2+16x-12\right|+\frac{1}{2\sqrt{7}}\ln\left|\frac{x+2-\sqrt{7}}{x+2+\sqrt{7}}\right|+C.$

9.19. $\int \frac{2x-1}{3x^2-6x-9}dx.$

Жауабы: $\frac{1}{3}\ln\left|3x^2-6x-9\right|+\frac{1}{12}\ln\left|\frac{x-3}{x+1}\right|+C.$

9.20. $\int \frac{2x-1}{3+x-2x^2}dx.$

Жауабы: $-\frac{1}{2}\ln\left|2x^2-x-3\right|+\frac{1}{10}\ln\left|\frac{2x-3}{2x+2}\right|+C.$

9.21. $\int \frac{x-4}{3x^2+x-1}dx.$

Жауабы: $\frac{1}{6}\ln\left|3x^2+x-1\right|-\frac{25}{6\sqrt{13}}\ln\left|\frac{6x+1-\sqrt{13}}{6x+1+\sqrt{13}}\right|+C.$

9.22. $\int \frac{3x+1}{x^2-4x-2}dx.$

Жауабы: $\frac{3}{2}\ln\left|x^2-4x-2\right|+\frac{7}{2\sqrt{6}}\ln\left|\frac{x-2-\sqrt{6}}{x-2+\sqrt{6}}\right|+C.$

9.23. $\int \frac{x-5}{2x^2+x-4}dx.$

Жауабы: $\frac{1}{4}\ln\left|2x^2+x-4\right|+\frac{21}{4\sqrt{33}}\ln\left|\frac{4x+1-\sqrt{33}}{4x+1+\sqrt{33}}\right|+C.$

9.24. $\int\frac{2x+3}{3x^2+2x-7}dx.$

Жауабы: $\frac{1}{3}\ln\left|3x^2+2x-7\right|+\frac{7}{6\sqrt{22}}\ln\left|\frac{3x+1-\sqrt{22}}{3x+1+\sqrt{22}}\right|+C.$

9.25. $\int\frac{x-3}{4x^2+2x-3}dx.$

Жауабы: $\frac{1}{8}\ln\left|4x^2+2x-3\right|-\frac{\sqrt{13}}{8}\ln\left|\frac{4x+1-\sqrt{13}}{4x+1+\sqrt{13}}\right|+C.$

9.26. $\int\frac{x+2}{3x^2-x+5}dx.$

Жауабы: $\frac{1}{6}\ln\left|3x^2-x+5\right|+\frac{13}{3\sqrt{59}}\operatorname{arctg}\frac{6x-1}{\sqrt{59}}+C.$

9.27. $\int\frac{3x-2}{x^2+5x-1}dx.$

Жауабы: $\frac{3}{2}\ln\left|x^2+5x-1\right|-\frac{19}{2\sqrt{29}}\ln\left|\frac{2x+5-\sqrt{29}}{2x+5+\sqrt{29}}\right|+C.$

9.28. $\int\frac{x-7}{4x^2+3x-1}dx.$

Жауабы: $\frac{1}{8}\ln\left|4x^2+3x-1\right|-\frac{59}{40}\ln\left|\frac{8x-2}{8x+8}\right|+C.$

9.29. $\int\frac{2x+1}{5x^2+2x+10}dx.$

Жауабы: $\frac{1}{5}\ln\left|5x^2+2x-10\right|+\frac{3}{5\sqrt{49}}\operatorname{arctg}\frac{5x+1}{\sqrt{49}}+C.$

9.30. $\int \frac{x-4}{5x^2-x+7}dx.$

Жауабы: $\frac{1}{10}\ln\left|5x^2-x+7\right|-\frac{39}{5\sqrt{139}}\operatorname{arctg}\frac{10x-1}{\sqrt{139}}+C.$

10.

10.1. $\int \frac{2x-13}{\sqrt{3x^2-3x-16}}dx.$

Жауабы: $\frac{2}{3}\sqrt{3x^2-3x-16}-4\sqrt{3}\ln\left|x-\frac{1}{2}+\sqrt{x^2-x-\frac{16}{3}}\right|+C.$

10.2. $\int \frac{x-3}{\sqrt{2x^2-4x-1}}dx.$

Жауабы: $\frac{1}{2}\sqrt{2x^2-4x-1}-\sqrt{2}\ln\left|x-1+\sqrt{x^2-2x-\frac{1}{2}}\right|+C.$

10.3. $\int \frac{x-1}{\sqrt{3x^2-x+5}}dx.$

Жауабы: $\frac{1}{3}\sqrt{3x^2-x+5}-\frac{5}{6\sqrt{3}}\ln\left|x-\frac{1}{6}+\sqrt{x^2-\frac{x}{3}+\frac{5}{3}}\right|+C.$

10.4. $\int \frac{2x+1}{\sqrt{1+x-3x^2}}dx.$

Жауабы: $-\frac{2}{3}\sqrt{1+x-3x^2}+\frac{4}{3\sqrt{3}}\arcsin\frac{6x-1}{\sqrt{3}}+C.$

10.5. $\int \frac{2x+5}{\sqrt{4x^2+8x+9}}dx.$

Жауабы: $\frac{1}{2}\sqrt{4x^2+8x+9}+\frac{3}{2}\ln\left|x+1+\sqrt{x^2+2x+\frac{9}{4}}\right|+C.$

10.6. $\int \frac{2x-10}{\sqrt{1+x-x^2}}dx.$

Жауабы: $-2\sqrt{1+x-x^2}-9\arcsin\frac{2x-1}{\sqrt{5}}+C.$

10.7. $\int \frac{2x-8}{\sqrt{1-x-x^2}}dx.$

Жауабы: $2\sqrt{1-x-x^2}-7\ln\left|x-\frac{1}{2}+\sqrt{x^2-x+1}\right|+C.$

10.8. $\int \frac{3x+4}{\sqrt{x^2+6x+13}}dx.$

Жауабы: $3\sqrt{x^2+6x+13}-5\ln\left|x+3+\sqrt{x^2+6x+13}\right|+C.$

10.9. $\int \frac{3x-1}{\sqrt{2x^2-5x+1}}dx.$

Жауабы: $\frac{3}{2}\sqrt{2x^2-5x+1}+\frac{11}{4\sqrt{2}}\ln\left|x-\frac{5}{4}+\sqrt{x^2-\frac{5}{2}x+\frac{1}{2}}\right|+C.$

10.10. $\int \frac{5x+2}{\sqrt{x^2+3x-4}}dx.$

Жауабы: $5\sqrt{x^2+3x-4}-\frac{11}{2}\ln\left|x+\frac{3}{2}+\sqrt{x^2+3x-4}\right|+C.$

10.11. $\int \frac{x-4}{\sqrt{2x^2-x+7}}dx.$

Жауабы: $\frac{1}{2}\sqrt{2x^2-x+7}-\frac{15}{4\sqrt{2}}\ln\left|x-\frac{1}{4}+\sqrt{x^2-\frac{x}{2}-\frac{7}{2}}\right|+C.$

10.12. $\int \frac{2x-1}{\sqrt{x^2-3x+4}}dx.$

Жауабы: $2\sqrt{x^2-3x+4}+2\ln\left|x-\frac{3}{2}+\sqrt{x^2-3x+4}\right|+C.$

10.13. $\int \frac{4x+1}{\sqrt{2+x-x^2}}dx.$

Жауабы: $-4\sqrt{2+x-x^2}+3\arcsin\frac{2x-1}{3}+C.$

10.14. $\int \frac{5x-3}{\sqrt{2x^2+4x-5}}dx.$

Жауабы: $\frac{5}{2}\sqrt{2x^2+4x-5}-4\sqrt{2}\ln\left|x+1+\sqrt{x^2+2x-\frac{5}{2}}\right|+C.$

10.15. $\int \frac{3x+2}{\sqrt{4+2x-x^2}}dx.$

Жауабы: $-3\sqrt{4+2x-x^2}+5\arcsin\frac{x-1}{\sqrt{5}}+C.$

10.16. $\int \frac{x-7}{\sqrt{3x^2-2x+1}}dx.$

Жауабы: $\frac{1}{3}\sqrt{3x^2-2x+1}-\frac{20}{3\sqrt{3}}\ln\left|x-\frac{1}{3}+\sqrt{x^2-\frac{2}{3}x+\frac{1}{3}}\right|+C.$

10.17. $\int \frac{x+5}{\sqrt{3-6x-x^2}}dx.$

Жауабы: $-\sqrt{3-6x-x^2}+2\arcsin\frac{x+3}{\sqrt{12}}+C.$

10.18. $\int \frac{2x+4}{\sqrt{3x^2+x-5}}dx.$

Жауабы: $\frac{2}{3}\sqrt{3x^2+x-5}+\frac{11}{3\sqrt{3}}\ln\left|x+\frac{1}{6}+\sqrt{x^2+\frac{x}{3}-\frac{5}{3}}\right|+C.$

10.19. $\int \frac{7x-2}{\sqrt{x^2-5x+1}}dx.$

Жауабы: $7\sqrt{x^2-5x+1}+\frac{31}{2}\ln\left|x-\frac{5}{2}+\sqrt{x^2-5x+1}\right|+C.$

10.20. $\int \frac{x-8}{\sqrt{4x^2+x-5}}dx.$

Жауабы: $\frac{1}{4}\sqrt{4x^2+x-5}-\frac{65}{16}\ln\left|x+\frac{1}{8}+\sqrt{x^2+\frac{1}{4}x-\frac{5}{4}}\right|+C.$

10.21. $\int \frac{3x+4}{\sqrt{2+3x-x^2}}dx.$

Жауабы: $-3\sqrt{2+3x-x^2}+\frac{17}{2}\arcsin\frac{2x-3}{\sqrt{17}}+C.$

10.22. $\int \frac{x-6}{\sqrt{3-2x-x^2}}dx.$

Жауабы: $-\sqrt{3-2x-x^2}-7\arcsin\frac{x+1}{2}+C.$

10.23. $\int \frac{2x+3}{\sqrt{2x^2-x+6}}dx.$

Жауабы: $\sqrt{2x^2-x+6}+\frac{7}{2\sqrt{2}}\ln\left|x-\frac{1}{4}+\sqrt{x^2-\frac{x}{2}+3}\right|+C.$

10.24. $\int \frac{x-9}{\sqrt{4+2x-x^2}}dx.$

Жауабы: $-\sqrt{4+2x-x^2}-8\arcsin\frac{x-1}{\sqrt{5}}+C.$

10.25. $\int \frac{2x+7}{\sqrt{x^2+5x-4}}dx.$

Жауабы: $2\sqrt{x^2+5x-4}+2\ln\left|x+\frac{5}{2}+\sqrt{x^2+5x-4}\right|+C.$

10.26. $\int \frac{3x-4}{\sqrt{2x^2-6x+1}}dx.$

Жауабы: $\frac{3}{2}\sqrt{2x^2-6x+1}+\frac{1}{2\sqrt{2}}\ln\left|x-\frac{3}{2}+\sqrt{x^2-3x+\frac{1}{2}}\right|+C.$

10.27. $\int \frac{2x+5}{\sqrt{3x^2+9x-4}}dx.$

Жауабы: $\frac{2}{3}\sqrt{3x^2+9x-4}+\frac{2}{\sqrt{3}}\ln\left|x+\frac{3}{2}+\sqrt{x^2+3x-\frac{4}{3}}\right|+C.$

10.28. $\int \frac{4x+3}{\sqrt{2x^2-x+5}}dx.$

Жауабы: $2\sqrt{2x^2-x+5}+2\sqrt{2}\ln\left|x-\frac{1}{4}+\sqrt{x^2-\frac{x}{2}+\frac{5}{2}}\right|+C.$

10.29. $\int \frac{3x-7}{\sqrt{x^2-5x+1}}dx.$

Жауабы: $3\sqrt{x^2-5x+1}+\frac{1}{2}\ln\left|x-\frac{5}{2}+\sqrt{x^2-5x+1}\right|+C.$

10.30. $\int \frac{7x-1}{\sqrt{2-3x-x^2}}dx.$

Жауабы: $-7\sqrt{2-3x-x^2}-\frac{23}{2}\arcsin\frac{2x+3}{\sqrt{17}}+C.$

7.2-ҮТ шығару үлгісі

Анықталмаған интегралды есептеу керек (§ 7.2)

1. $\int \frac{3-7x}{4x^2+5}dx.$

▶

$$\int \frac{3-7x}{4x^2+5}dx=3\int \frac{dx}{(2x)^2+\left(\sqrt{5}\right)^2}-7\int \frac{xdx}{4x^2+5}=\frac{3}{2}\int \frac{d(2x)}{(2x)^2+\left(\sqrt{5}\right)^2}-$$

$$-\frac{7}{8}\int \frac{8xdx}{4x^2+5}=\frac{3}{2}\frac{1}{\sqrt{5}}\operatorname{arctg}\frac{2x}{\sqrt{5}}-\frac{7}{8}\ln\left(4x^2+5\right)+C. \quad ◀$$

2. $\int \dfrac{dx}{e^{3x}\left(2-e^{-3x}\right)}$.

► Айнымалды ауыстырамыз: $u=2-e^{-3x}$. Онда $du=3\,e^{-3x}dx$ және

$$\int \frac{dx}{e^{3x}\left(2-e^{-3x}\right)}=\frac{1}{3}\int \frac{3e^{-3x}dx}{2-e^{-3x}}=\frac{1}{2}\ln\left|2-e^{-3x}\right|+C. \quad ◄$$

3. $\int \dfrac{3x^5-4x}{x^2+1}dx.$

► Интеграл астында бұрыс бөлшек тұр. Алымын бөліміне бөліп, оны бүтін бөлік пен дұрыс бөлшек қосындысына келтіріп алып интегралдаймыз (7.2.3 п. қараңыз):

$$\int \frac{3x^5-4x}{x^2+1}dx=\int\left(3x^3-3x-\frac{x}{x^2+1}\right)dx=\frac{3}{4}x^4-\frac{3}{2}x^2-\frac{1}{2}\ln\left(x^2+1\right)+C.$$

◄

Назарыңызға: 7.2.3 п. 1 және 2 мысалдарды қараңыз.

4. $\int \cos^3\left(7x+2\right)dx.$

► Бұл $\int \sin^m x\cdot\cos^n x dx$ түріндегі интегралдың $m=0,\quad n=3$ жағдайы (§ 7.3., (6)-формула, а) мысалды қараңыз). Тригонометриялық тепе-теңдікті: $\cos^2\left(7x+2\right)=1-\sin^2\left(7x+2\right)$ пайдаланып, табамыз:

$$\int \cos^3\left(7x+2\right)dx=\int \cos^2\left(7x+2\right)\cos\left(7x+2\right)dx=$$
$$=\int\left(1-\sin^2\left(7x+2\right)\right)\cos\left(7x+2\right)dx=$$

$$= \int \cos(7x+2)\,dx - \int \sin^2(7x+2)\cos(7x+2)\,dx = \frac{1}{7}\sin(7x+2) -$$

$$-\frac{1}{7}\int \sin^2(7x+2)\,d\left(\sin(7x+2)\right) =$$

$$= \frac{1}{7}(7x+2) - \frac{1}{21}\sin^3(7x+2) + C. \quad \blacktriangleleft$$

5. $\int ctg^4 5x dx.$

▶ $\operatorname{ctg}^2 5x = \dfrac{1}{\sin^2 5x} - 1$ теңдігін пайдаланамыз:

$$\int \operatorname{ctg}^4 5x dx = \int \operatorname{ctg}^2 5x\left(\frac{1}{\sin^2 5x} - 1\right)dx = \int \operatorname{ctg}^2 5x \frac{1}{\sin^2 5x}dx - \int \operatorname{ctg}^2 5x dx =$$

$$= -\frac{1}{5}\int \operatorname{ctg}^2 5x\left(-\frac{5}{\sin^2 5x}\right)dx - \int\left(\frac{1}{\sin^2 5x} - 1\right)dx =$$

$$= -\frac{1}{15}\operatorname{ctg}^3 5x + \frac{1}{5}\operatorname{ctg} 5x + x + C\ . \quad \blacktriangleleft$$

6. $\int \sin\frac{7}{2}x \sin\frac{3}{2}x dx.$

▶

$$\int \sin\frac{7}{2}x \sin\frac{3}{2}x dx = \frac{1}{2}\int(\cos 2x - \cos 5x)\,dx = \frac{1}{4}\sin 2x - \frac{1}{10}\sin 5x + C.$$

◀

Назарыңызға: § 7.3 п. соңғы мысалды қараңыз.

7. $\int \dfrac{dx}{6x^2 - 3x + 2}.$

▶ Бұл 7.2.1 п. (*) түріндегі интеграл. Ондағы мысалда көрсетілген әдісті қолданамыз:

$$\int\frac{dx}{6x^2-3x+2}=\frac{1}{6}\int\frac{dx}{x^2-\frac{1}{2}x+\frac{1}{3}}=$$

$$=\frac{1}{6}\int\frac{dx}{\left(x-\frac{1}{4}\right)^2+\frac{1}{3}-\frac{1}{16}}=\frac{1}{6}\int\frac{dx}{\left(x-\frac{1}{4}\right)^2+\left(\frac{\sqrt{13}}{4\sqrt{3}}\right)^2}=$$

$$=\frac{4\sqrt{3}}{6\sqrt{13}}\operatorname{arctg}\frac{x-\frac{1}{4}}{\frac{\sqrt{13}}{4\sqrt{3}}}+C=\frac{2\sqrt{3}}{3\sqrt{13}}\operatorname{arctg}\frac{(4x-1)\sqrt{3}}{\sqrt{13}}+C. \quad \blacktriangleleft$$

8. $\int\frac{3x-6}{2-5x-x^2}dx.$

► Мұнда 7.2.1 п. б) көрсетілген әдісті қолданамыз:

$$\int\frac{3x-6}{2-5x-x^2}dx=-\frac{3}{2}\int\frac{-2x+4-5+5}{2-5x-x^2}dx=$$

$$=-\frac{3}{2}\int\frac{-2x-5}{2-5x-x^2}dx-\frac{3}{2}\cdot 9\int\frac{dx}{2-5x-x^2}=$$

$$=-\frac{3}{2}\ln\left|2-5x+x^2\right|+\frac{27}{2}\int\frac{dx}{\left(x-\frac{5}{2}\right)^2-2-\frac{25}{4}}=-\frac{3}{2}\ln\left|2-5x+x^2\right|+$$

$$+\frac{27}{2}\int\frac{dx}{\left(x-\frac{5}{2}\right)^2-\left(\frac{\sqrt{33}}{2}\right)^2}=$$

$$=-\frac{3}{2}\ln\left|2-5x+x^2\right|+\frac{27}{2\sqrt{33}}\ln\left|\frac{x-\frac{5}{2}-\frac{\sqrt{33}}{2}}{x-\frac{5}{2}+\frac{\sqrt{33}}{2}}\right|+C=$$

$$= -\frac{3}{2}\ln\left|2-5x+x^2\right| + \frac{9\sqrt{3}}{2\sqrt{11}}\ln\left|\frac{2x-5-\sqrt{33}}{2x-5+\sqrt{33}}\right| + C. \quad \blacktriangleleft$$

9. $\int \dfrac{dx}{\sqrt{5x^2+2x-7}}.$

► Бұған 7.2.1 п. (*) көрсетілген интегралдау әдісін қолда-намыз:

$$\int \frac{dx}{\sqrt{5x^2+2x-7}} = \frac{1}{\sqrt{5}}\int \frac{dx}{\sqrt{x^2+\frac{2}{5}x-\frac{7}{5}}} = \frac{1}{\sqrt{5}}\int \frac{d\left(x+\frac{1}{5}\right)}{\sqrt{\left(x+\frac{1}{5}\right)^2-\frac{7}{5}-\frac{1}{25}}} =$$

$$= \frac{1}{\sqrt{5}}\ln\left|x+\frac{1}{5}+\sqrt{x^2+\frac{2}{5}x-\frac{7}{5}}\right| + C. \quad \blacktriangleleft$$

10. $\int \dfrac{2x-7}{\sqrt{1-4x-3x^2}}dx.$

► Мұнда 7.2.1 п. Ескертуде көрсетілген әдіс қолданылады:

$$\int \frac{2x-7}{\sqrt{1-4x-3x^2}}dx = -\frac{1}{3}\int \frac{-6x+21-4+4}{\sqrt{1-4x-3x^2}}dx =$$

$$= -\frac{1}{3}\int \frac{-6x-4}{\sqrt{1-4x-3x^2}}dx - \frac{25}{3\sqrt{3}}\int \frac{dx}{\sqrt{\frac{1}{3}-\frac{4}{3}x-x^2}} =$$

$$= -\frac{2}{3}\sqrt{1-4x-3x^2} - \frac{25}{3\sqrt{3}}\int \frac{dx}{\sqrt{\left(\frac{\sqrt{7}}{3}\right)^2-\left(x+\frac{2}{3}\right)^2}} =$$

$$= -\frac{2}{3}\sqrt{1-4x-3x^2} - \frac{25}{3\sqrt{3}}\arcsin\frac{x+\frac{2}{3}}{\frac{\sqrt{7}}{3}} + C =$$

$$= -\frac{2}{3}\sqrt{1-4x-3x^2} - \frac{25}{3\sqrt{3}}\arcsin\frac{3x+2}{\sqrt{7}} + C. \quad \blacktriangleleft$$

7.3-YT
Анықталмаған интегралдарды табыңыз

1.

1.1. $\int \frac{\sqrt{1-x^2}}{x}dx.$ **Жауабы:** $\frac{1}{2}\ln\left|\frac{\sqrt{1-x^2}-1}{\sqrt{1-x^2}+1}\right| + \sqrt{1-x^2} + C.$

1.2. $\int \frac{\sqrt{x^2-1}}{x}dx.$ **Жауабы:** $\sqrt{x^2-1}\arccos\frac{1}{x} + C.$

1.3. $\int \frac{\sqrt{x^2+4}}{x}dx.$ **Жауабы:** $\sqrt{4+x^2} + \ln\left|\frac{2-\sqrt{4+x^2}}{2+\sqrt{4+x^2}}\right| + C.$

1.4. $\int \frac{\sqrt{1-x^2}}{x^4}dx.$ **Жауабы:** $C - \frac{1}{3}\frac{\sqrt{(1-x^2)^3}}{x^3}.$

1.5. $\int\sqrt{4-x^2}dx.$ **Жауабы:** $2\arcsin\frac{x}{2} + \frac{x}{2}\sqrt{4-x^2} + C.$

1.6. $\int \frac{\sqrt{x^2+9}}{x}dx.$ **Жауабы:** $\sqrt{x^2+9} + \frac{3}{2}\ln\left|\frac{3-\sqrt{x^2+9}}{3+\sqrt{x^2+9}}\right| + C.$

1.7. $\int \frac{\sqrt{x^2+4}}{x^2}dx.$ **Жауабы:** $\ln\left|\frac{x+\sqrt{4+x^2}}{x-\sqrt{4+x^2}}\right| - \frac{\sqrt{4-x^2}}{x} + C.$

1.8. $\int \frac{\sqrt{4-x^2}}{x^4}dx.$ **Жауабы:** $C-\frac{1}{12}\frac{\sqrt{\left(4-x^2\right)^3}}{x^3}.$

1.9. $\int \frac{dx}{\sqrt{\left(1+x^2\right)^3}}.$ **Жауабы:** $\frac{x}{\sqrt{1+x^2}}+C.$

1.10. $\int \frac{\sqrt{x^2+4}}{x^4}dx.$ **Жауабы:** $C-\frac{1}{12}\frac{\sqrt{(4+x^2)^3}}{x^3}.$

1.11. $\int \frac{\sqrt{\left(4-x^2\right)3}}{x^6}dx.$ **Жауабы:** $C-\frac{1}{20}\frac{\sqrt{\left(4-x^2\right)^5}}{x^5}.$

1.12. $\int \frac{dx}{\sqrt{\left(1+x^2\right)^5}}.$ **Жауабы:** $\frac{x}{\sqrt{1+x^2}}-\frac{1}{3}\frac{x^3}{\sqrt{\left(1+x^2\right)^3}}+C.$

1.13. $\int \frac{\sqrt{x^2-9}}{x}dx.$ **Жауабы:** $\sqrt{x^2-9}-3\arccos\frac{3}{x}+C.$

1.14. $\int \frac{dx}{\sqrt{\left(x^2-1\right)^3}}.$ **Жауабы:** $C-\frac{x}{\sqrt{x^2-1}}.$

1.15. $\int x^3\sqrt{9-x^2}dx.$ **Жауабы:** $\frac{1}{5}\sqrt{\left(9-x^2\right)^5}-3\sqrt{\left(9-x^2\right)^3}+C.$

1.16. $\int \frac{dx}{x^2\sqrt{\left(x^2-1\right)^3}}.$ **Жауабы:** $C-\frac{x}{\sqrt{x^2-1}}-\frac{\sqrt{x^2-1}}{x}.$

1.17. $\int \frac{dx}{x^2\sqrt{x^2-1}}.$ **Жауабы:** $\frac{\sqrt{x^2-1}}{x}+C.$

1.18. $\int \frac{\sqrt{x^2-9}}{x^2}dx.$ **Жауабы:** $\frac{1}{2}\ln\left|\frac{\sqrt{x^2-9}+x}{\sqrt{x^2-9}-x}\right|-\frac{\sqrt{x^2-9}}{x}+C.$

1.19. $\int \frac{dx}{x^3\sqrt{x^2-1}}dx.$ **Жауабы:** $\frac{1}{2}\arccos\frac{1}{x}+\frac{\sqrt{x^2-1}}{2x^2}+C.$

1.20. $\int \frac{\sqrt{9-x^2}}{x^4}dx.$ **Жауабы:** $C-\frac{1}{27}\frac{\sqrt{\left(9-x^2\right)^3}}{x^3}.$

1.21. $\int \frac{dx}{x^2\sqrt{x^2+9}}.$ **Жауабы:** $C-\frac{\sqrt{9+x^2}}{9x}.$

1.22. $\int x^2\sqrt{1-x^2}dx.$ **Жауабы:** $\frac{1}{8}\arcsin x-\frac{1}{8}x\sqrt{1-x^2}\left(1-2x^2\right)+C.$

1.23. $\int x^3\sqrt{1-x^2}dx.$ **Жауабы:** $\frac{1}{5}\sqrt{\left(1-x^2\right)^5}-\frac{1}{3}x\sqrt{\left(1-x^2\right)^3}+C.$

1.24. $\int \frac{\sqrt{\left(4-x^2\right)^3}}{x^4}dx.$ **Жауабы:** $\arcsin\frac{x}{2}+\frac{\sqrt{4-x^2}}{x}-\frac{1}{3}\frac{\sqrt{\left(4-x^2\right)^3}}{x^3}+C.$

1.25. $\int \frac{dx}{\sqrt{\left(4+x^2\right)^3}}.$ **Жауабы:** $\frac{x}{4\sqrt{4+x^2}}+C.$

1.26. $\int \frac{\sqrt{x^2+9}}{x^4}dx.$ **Жауабы:** $C-\frac{1}{27}\frac{\sqrt{\left(9+x^2\right)^3}}{x^3}.$

1.27. $\int \frac{dx}{\sqrt{\left(9+x^2\right)^3}}.$ **Жауабы:** $\frac{1}{9}\frac{x}{\sqrt{9+x^2}}+C.$

1.28. $\int \frac{x^2dx}{\sqrt{9-x^2}}.$ **Жауабы:** $\frac{9}{2}\arcsin\frac{x}{3}-\frac{1}{2}x\sqrt{9-x^2}+C.$

1.29. $\int \frac{\sqrt{16-x^2}}{x^4}dx.$ **Жауабы:** $C-\frac{1}{48}\frac{x^3}{\sqrt{16-x^2}}.$

1.30. $\int \frac{\sqrt{16-x^2}}{x^2}dx.$ **Жауабы:** $C-\arcsin\frac{x}{4}-\frac{x}{\sqrt{16-x^2}}.$

2.

2.1. $\int \frac{dx}{(x+1)\sqrt{1+x^2}}.$ **Жауабы:** $C-\frac{1}{\sqrt{2}}\ln\left|\frac{1}{x+1}-\frac{1}{2}+\frac{\sqrt{1+x^2}}{\sqrt{2}(x+1)}\right|.$

2.2. $\int \frac{dx}{(x+1)\sqrt{x^2-1}}.$ **Жауабы:** $\sqrt{\frac{x-1}{x+1}}+C.$

2.3. $\int \frac{dx}{(x-1)\sqrt{x^2-1}}.$ **Жауабы:** $C-\sqrt{\frac{x+1}{x-1}}.$

2.4. $\int \frac{dx}{x\sqrt{1-x^2}}.$ **Жауабы:** $C-\ln\left|\frac{1+\sqrt{1-x^2}}{x}\right|.$

2.5. $\int \frac{dx}{x\sqrt{1+x^2}}.$ **Жауабы:** $C-\ln\left|\frac{1+\sqrt{1+x^2}}{x}\right|.$

2.6. $\int \frac{dx}{x\sqrt{x^2-1}}.$ **Жауабы:** $C-\arcsin\frac{1}{x}.$

2.7. $\int \frac{dx}{x\sqrt{x^2+x+1}}.$ **Жауабы:** $C-\ln\left|\frac{1}{x}+\frac{1}{2}+\frac{\sqrt{x^2+x+1}}{x}\right|.$

2.8. $\int \frac{dx}{x\sqrt{x^2-x+1}}.$ **Жауабы:** $C-\ln\left|\frac{1+\sqrt{x^2-x+1}}{x}-\frac{1}{2}\right|.$

2.9. $\int \frac{dx}{x\sqrt{x^2+x-1}}.$ **Жауабы:** $C-\arcsin\frac{2-x}{\sqrt{5}x}.$

2.10. $\int \frac{dx}{x\sqrt{x^2-x-1}}$. **Жауабы:** $C-\arcsin\frac{x+2}{\sqrt{5}x}$.

2.11. $\int \frac{dx}{x\sqrt{1+x-x^2}}$. **Жауабы:** $C-\ln\left|\frac{1}{x}+\frac{1}{2}+\frac{\sqrt{1+x-x^2}}{x}\right|$.

2.12. $\int \frac{dx}{x\sqrt{x^2+x-2}}$. **Жауабы:** $C-\frac{1}{\sqrt{2}}\arcsin\frac{4-x}{3x}$.

2.13. $\int \frac{dx}{(x+1)\sqrt{x^2-x+1}}$. **Жауабы:** $C-\frac{1}{\sqrt{3}}\ln\left|\frac{1}{x+1}-\frac{1}{2}+\frac{\sqrt{x^2-x+1}}{\sqrt{3}(x+1)}\right|$.

2.14. $\int \frac{dx}{(x+1)\sqrt{x^2-x-1}}$. **Жауабы:** $C-\ln\left|\frac{1}{x+1}-\frac{3}{2}+\frac{\sqrt{x^2-x-1}}{x+1}\right|$.

2.15. $\int \frac{dx}{(x+1)\sqrt{x^2+x+1}}$. **Жауабы:** $C-\ln\left|\frac{1}{x+1}-\frac{1}{2}+\frac{\sqrt{x^2+x+1}}{x+1}\right|$.

2.16. $\int \frac{dx}{(x+1)\sqrt{x^2+x-1}}$. **Жауабы:** $C-\arcsin\frac{x+3}{\sqrt{5}(x+1)}$.

2.17. $\int \frac{dx}{(x+1)\sqrt{1+x-x^2}}$. **Жауабы:** $\arcsin\frac{3x+1}{\sqrt{5}(x+1)}+C$.

2.18. $\int \frac{dx}{(x-1)\sqrt{x^2+x+1}}$. **Жауабы:** $C-\frac{1}{\sqrt{3}}\ln\left|\frac{1}{x-1}+\frac{1}{2}+\frac{\sqrt{x^2+x+1}}{\sqrt{3}(x-1)}\right|$.

2.19. $\int \frac{dx}{(x-1)\sqrt{x^2-x+1}}$. **Жауабы:** $C-\ln\left|\frac{1}{x-1}+\frac{1}{2}+\frac{\sqrt{x^2-x+1}}{x-1}\right|$.

2.20. $\int \frac{dx}{(x-1)\sqrt{x^2+x-1}}$. **Жауабы:** $C-\ln\left|\frac{1}{x-1}+\frac{3}{2}+\frac{\sqrt{x^2+x-1}}{x-1}\right|$.

2.21. $\int \frac{dx}{(x-1)\sqrt{x^2-x-1}}$. **Жауабы:** $C - \arcsin\frac{3-x}{\sqrt{5}(x-1)}$.

2.22. $\int \frac{dx}{(x-1)\sqrt{1+x-x^2}}$. **Жауабы:** $C - \ln\left|\frac{1}{x-1} - \frac{1}{2} + \frac{\sqrt{1+x-x^2}}{x-1}\right|$.

2.23. $\int \frac{dx}{(x+1)\sqrt{1-x-x^2}}$. **Жауабы:** $C - \ln\left|\frac{1}{x+1} + \frac{1}{2} + \frac{\sqrt{1-x-x^2}}{x+1}\right|$.

2.24. $\int \frac{dx}{(x-1)\sqrt{1-x-x^2}}$. **Жауабы:** $C - \arcsin\frac{3x-1}{\sqrt{5}(x-1)}$.

2.25. $\int \frac{dx}{x\sqrt{1-x-x^2}}$. **Жауабы:** $C - \ln\left|\frac{1}{x} - \frac{1}{2} + \frac{\sqrt{1-x-x^2}}{x}\right|$.

2.26. $\int \frac{dx}{x\sqrt{x^2+x-3}}$. **Жауабы:** $C - \frac{1}{\sqrt{3}}\arcsin\frac{6-x}{x\sqrt{3}}$.

2.27. $\int \frac{dx}{(x+1)\sqrt{x^2+x-2}}$. **Жауабы:** $C - \frac{1}{\sqrt{2}}\arcsin\frac{x+5}{3(x+1)}$.

2.28. $\int \frac{dx}{x\sqrt{x^2-3x+2}}$. **Жауабы:** $C - \frac{1}{\sqrt{2}}\ln\left|\frac{1}{x} - \frac{3}{4} + \frac{\sqrt{x^2-3x+2}}{2x}\right|$.

2.29. $\int \frac{dx}{(x+1)\sqrt{2-x-x^2}}$. **Жауабы:** $C - \frac{1}{\sqrt{2}}\ln\left|\frac{1}{x+1} + \frac{1}{4} + \frac{\sqrt{2-x-x^2}}{x+1}\right|$.

2.30. $\int \frac{dx}{x\sqrt{1-3x-2x^2}}$. **Жауабы:** $C - \ln\left|\frac{1}{x} - \frac{3}{2} + \frac{\sqrt{1-3x-2x^2}}{x}\right|$.

3.

3.1. $\int \frac{\ln(\cos x)}{\cos^2 x}dx$. **Жауабы:** $\operatorname{tg} x \ln(\cos x) + \operatorname{tg} x - x + C$.

3.2. $\int \cos(\ln x)\,dx.$ **Жауабы:** $\frac{x}{2}\left(\sin(\ln x)+\cos(\ln x)\right)+C.$

3.3. $\int \frac{\ln x}{x^2}\,dx.$ **Жауабы:** $C-\frac{\ln x+1}{x}.$

3.4. $\int \ln(x+2)\,dx.$ **Жауабы:** $x\ln(x+2)-x+2\ln(x+2)+C.$

3.5. $\int \frac{\ln(\cos x)}{\sin^2 x}\,dx.$ **Жауабы:** $C-\operatorname{ctg} x\ln(\cos x)-x.$

3.6. $\int \frac{\ln(\ln x)}{x}\,dx.$ **Жауабы:** $\ln x\ln(\ln x)-\ln x+C.$

3.7. $\int \ln^2 x dx.$ **Жауабы:** $x\ln^2 x-2x\ln x+2x+C.$

3.8. $\int \frac{\ln x}{\sqrt{x}}\,dx.$ **Жауабы:** $2\sqrt{x}\ln x-4\sqrt{x}+C.$

3.9. $\int x\ln\frac{1-x}{1+x}\,dx.$ **Жауабы:** $\frac{x^2}{2}\ln\frac{1-x}{1+x}-x-\frac{1}{2}\ln\frac{1-x}{1+x}+C.$

3.10. $\int \ln\left(x+\sqrt{1+x^2}\right)dx.$ **Жауабы:** $x\ln\left(x+\sqrt{1+x^2}\right)-\sqrt{1+x^2}+C.$

3.11. $\int \ln(x+4)\,dx.$ **Жауабы:** $x\ln(x+4)-x+4\ln(x+4)+C.$

3.12. $\int \frac{x\ln\left(x+\sqrt{1+x^2}\right)}{\sqrt{1+x^2}}\,dx.$ **Жауабы:** $\sqrt{1+x^2}\ln\left(x+\sqrt{1+x^2}\right)-x+C.$

3.13. $\int \frac{\ln(\sin x)}{\sin^2 x}\,dx.$ **Жауабы:** $C-x-\operatorname{ctg} x-\operatorname{ctg} x\ln(\sin x).$

3.14. $\int x^2\ln(x+1)\,dx.$ **Жауабы:** $\frac{x^3}{3}\ln(x+1)-\frac{x^3}{9}+\frac{x^2}{6}-\frac{x}{3}+\frac{1}{3}\ln(x+1)+C.$

3.15. $\int \frac{\ln x\ln(\ln x)}{x}\,dx.$ **Жауабы:** $\frac{1}{2}\ln^2 x\ln(\ln x)-\frac{1}{4}\ln^2 x+C.$

3.16. $\int \ln\left(x^2+1\right)dx.$ **Жауабы:** $x\ln\left(x^2+1\right)-2x+2\operatorname{arctg}x+C.$

3.17. $\int \frac{\ln x}{x^3}dx.$ **Жауабы:** $C-\frac{\ln x}{2x^2}-\frac{1}{4x^2}.$

3.18. $\int \sqrt{x}\ln^2 x dx.$ **Жауабы:** $\frac{2}{3}\sqrt{x^3}\ln^2 x-\frac{8}{9}\sqrt{x^3}\ln x+\frac{16}{27}\sqrt{x^3}+C.$

3.19. $\int \ln\frac{1-x}{1+x}dx.$ **Жауабы:** $x\ln\frac{1-x}{1+x}-\ln\left(x^2-1\right)+C.$

3.20. $\int \left(x^2-x+1\right)\ln x dx.$

Жауабы: $\left(\frac{x^3}{3}-\frac{x^2}{2}+x\right)\ln x-\frac{x^3}{9}+\frac{x^2}{4}-x+C.$

3.21. $\int \sqrt{x}\ln x dx.$ **Жауабы:** $\frac{2}{3}\sqrt{x^3}\ln x-\frac{4}{9}\sqrt{x^3}+C.$

3.22. $\int \frac{\ln(\sin x)}{\cos^2 x}dx.$ **Жауабы:** $\operatorname{tg}x\ln(\sin x)-x+C.$

3.23. $\int x\ln\left(x^2+1\right)dx.$ **Жауабы:** $\frac{x^2}{2}\ln\left(x^2+1\right)-\frac{x^2}{2}+\frac{1}{2}\ln\left(x^2+1\right)+C.$

3.24. $\int x\ln^2 x dx.$ **Жауабы:** $\frac{x^2}{2}\ln^2 x-\frac{x^2}{2}\ln x+\frac{x^2}{4}+C.$

3.25. $\int x^2\ln x dx.$ **Жауабы:** $\frac{x^3}{3}\ln x-\frac{x^3}{9}+C.$

3.26. $\int x\ln(x+1)dx.$ **Жауабы:** $\frac{x^2}{2}\ln(x+1)-\frac{x^2}{4}+\frac{x}{2}-\frac{1}{2}\ln(x+1)+C.$

3.27. $\int \sin\left(\ln x\right)dx.$ **Жауабы:** $\frac{x}{2}\left(\sin\left(\ln x\right)-\cos\left(\ln x\right)\right)+C.$

3.28. $\int \left(x^2-4\right)\sin 5x dx.$ **Жауабы:** $\frac{2}{25}x\sin 5x-\frac{x^2-21}{5}\cos 5x+C.$

3.29. $\int \ln\left(x+5\right)dx.$ **Жауабы:** $x\ln\left(x+5\right)-x+5\ln\left(x+5\right)+C.$

3.30. $\int \ln\frac{2-x}{2+x}dx.$ **Жауабы:** $x\ln\frac{2-x}{2+x}-2\ln\left|4-x^2\right|+C.$

4.

4.1. $\int\sqrt{1-x}\arccos\sqrt{x}dx.$

Жауабы: $\frac{2}{9}\sqrt{x^3}-\frac{2}{3}\sqrt{x}-\frac{2}{3}\sqrt{(1-x)^3}\arccos\sqrt{x}+C.$

4.2. $\int\sqrt{1-x}\arcsin\sqrt{x}dx.$

Жауабы: $\frac{2}{3}\sqrt{x}-\frac{2}{9}\sqrt{x^3}-\frac{2}{3}\sqrt{(1-x)^3}\arcsin\sqrt{x}+C.$

4.3. $\int x\operatorname{arctg}2xdx.$ **Жауабы:** $\frac{x^2}{2}\operatorname{arctg}2x-\frac{x}{4}+\frac{1}{8}\operatorname{arctg}2x+C.$

4.4. $\int\frac{\arcsin x}{\sqrt{x+1}}dx.$ **Жауабы:** $2\sqrt{x+1}\arcsin x+4\sqrt{1-x}+C.$

4.5. $\int\frac{\arcsin x}{\sqrt{1-x}}dx.$ **Жауабы:** $4\sqrt{1+x}-2\sqrt{1-x}\arcsin x+C.$

4.6. $\int\frac{\arcsin\sqrt{x}}{\sqrt{1-x}}dx.$ **Жауабы:** $2\sqrt{x}-2\sqrt{1-x}\arcsin\sqrt{x}+C.$

4.7. $\int\frac{x\operatorname{arctg}x}{\sqrt{1+x^2}}dx.$ **Жауабы:** $\sqrt{1+x^2}\operatorname{arctg}x-\ln\left|x+\sqrt{1+x^2}\right|+C.$

4.8. $\int\frac{x\arcsin x}{\sqrt{1-x^2}}dx.$ **Жауабы:** $x-\sqrt{1-x^2}\arcsin x+C.$

4.9. $\int x\operatorname{arctg}xdx.$ **Жауабы:** $\frac{x^2}{2}\operatorname{arctg}x-\frac{x}{2}+\frac{1}{2}\operatorname{arctg}x+C.$

4.10. $\int x\operatorname{arcctg}xdx.$ **Жауабы:** $\frac{x^2}{2}\operatorname{arcctg}x+\frac{x}{2}+\frac{1}{2}\operatorname{arcctg}x+C.$

4.11. $\int \frac{x \arccos 2x}{\sqrt{1-4x^2}} dx.$ **Жауабы:** $C - \frac{x}{2} - \frac{1}{4}\sqrt{1-4x^2} \arccos 2x.$

4.12. $\int \arccos 2x dx.$ **Жауабы:** $\arccos 2x - \frac{1}{2}\sqrt{1-4x^2} + C.$

4.13. $\int \operatorname{arctg} x dx.$ **Жауабы:** $x \operatorname{arctg} x - \frac{1}{2}\ln\left(1+x^2\right) + C.$

4.14. $\int \frac{\arccos\sqrt{x}}{\sqrt{1-x}} dx.$ **Жауабы:** $C - 2\sqrt{x} - 2\sqrt{1-x} \arccos\sqrt{x}.$

4.15. $\int \frac{x \arccos x}{\sqrt{1-x^2}} dx.$ **Жауабы:** $C - x - \sqrt{1-x^2} \arccos x.$

4.16. $\int \frac{\arccos x}{\sqrt{1-x}} dx.$ **Жауабы:** $C - 4\sqrt{1+x} - 2\sqrt{1-x} \arccos x.$

4.17. $\int \operatorname{arcctg} 2x dx.$ **Жауабы:** $x \operatorname{arcctg} 2x + \frac{1}{4}\ln\left(1+4x^2\right) + C.$

4.18. $\int \frac{x \operatorname{arcctg} x}{\sqrt{1+x^2}} dx.$ **Жауабы:** $\sqrt{1+x^2} \operatorname{arcctg} x + \ln\left|x + \sqrt{1+x^2}\right| + C.$

4.19. $\int \arcsin 2x dx.$ **Жауабы:** $x \arcsin 2x + \frac{1}{2}\sqrt{1-4x^2} + C.$

4.20. $\int \frac{x \arcsin 2x}{\sqrt{1-4x^2}} dx.$ **Жауабы:** $\frac{1}{2}x - \frac{1}{4}\sqrt{1-4x^2} \arcsin 2x + C.$

4.21. $\int \frac{\arccos x}{\sqrt{1+x}} dx.$ **Жауабы:** $2\sqrt{1+x} \arccos x - 4\sqrt{1-x} + C.$

4.22. $\int x^2 \operatorname{arctg} x dx.$ **Жауабы:** $\frac{x^3}{3} \operatorname{arctg} x - \frac{1}{6}x^2 + \frac{1}{6}\ln\left(x^2+1\right) + C.$

4.23. $\int x \operatorname{arctg} 2x dx.$ **Жауабы:** $\frac{x^2}{2} \operatorname{arctg} 2x - \frac{x}{4} + \frac{1}{8} \operatorname{arctg} 2x + C.$

4.24. $\int \operatorname{arctg}\left(x+5\right) dx.$

Жауабы: $x\operatorname{arctg}(x+5)-\frac{1}{2}\ln\left|x^2+10x+26\right|+5\operatorname{arctg}(x+5)+C.$

4.25. $\int x^2\operatorname{arcctg}x dx.$ **Жауабы:** $\frac{x^3}{3}\operatorname{arcctg}x+\frac{x^2}{6}-\frac{1}{6}\ln\left(x^2+1\right)+C.$

4.26. $\int x\operatorname{arctg}^2 x dx.$

Жауабы: $\frac{x^2}{2}\operatorname{arctg}^2 x+\frac{1}{2}\operatorname{arctg}^2 x-x\operatorname{arctg}x+\frac{1}{2}\ln\left(x^2+1\right)+C.$

4.27. $\int x^2\cos\frac{x}{3}dx.$ **Жауабы:** $3x^2\sin\frac{x}{3}+18x\frac{x}{3}-54\sin\frac{x}{3}+C.$

4.28. $\int x\operatorname{arcctg}^2 x dx.$

Жауабы: $\frac{x^2}{2}\operatorname{arcctg}^2 x+\frac{1}{2}\operatorname{arcctg}^2 x+x\operatorname{arcctg}x+\frac{1}{2}\ln\left(x^2+1\right)+C.$

4.29. $\int x^2\sin 2x dx.$ **Жауабы:** $\frac{x}{2}\sin 2x-\frac{x^2}{2}\cos 2x+\frac{1}{4}\cos 2x+C.$

4.30. $\int\left(x^2+4\right)e^{2x}dx.$ **Жауабы:** $\frac{1}{2}\left(x^2+4\right)e^{2x}+\frac{1}{2}xe^{2x}+\frac{1}{4}e^{2x}+C.$

5.

5.1. $\int x^2\cos 2x dx.$ **Жауабы:** $\frac{x^2}{2}\sin 2x+\frac{x}{2}\cos 2x-\frac{1}{4}\sin 2x+C.$

5.2. $\int x\sin^2 x dx.$ **Жауабы:** $\frac{x^2}{4}-\frac{x}{4}\sin 2x-\frac{1}{8}\cos 2x+C.$

5.3. $\int x\sin x\cos x dx.$ **Жауабы:** $\frac{1}{8}\sin 2x-\frac{x}{4}\cos 2x+C.$

5.4. $\int x^2\left(\sin 2x-3\right)dx.$

Жауабы: $\frac{x}{2}\sin 2x-\frac{x^2}{2}\cos 2x+\frac{1}{4}\cos 2x-x^3+C.$

5.5. $\int x^2(\sin x+1)dx.$ **Жауабы:** $2x\sin x-x^2\cos x+2\cos x+\frac{x^3}{3}+C.$

5.6. $\int\left(x^2+x\right)e^{-x}dx.$ **Жауабы:** $C-\left(x^2+3x+3\right)e^{-x}.$

5.7. $\int\left(x^2+x\right)e^{x}dx.$ **Жауабы:** $\left(x^2-x+1\right)e^{x}+C.$

5.8. $\int\left(x^2-x+1\right)e^{-x}dx.$ **Жауабы:** $C-\left(x^2+x+2\right)e^{-x}.$

5.9. $\int\left(x^2-x+1\right)e^{x}dx.$ **Жауабы:** $\left(x^3-3x+4\right)e^{x}+C.$

5.10. $\int x\operatorname{ctg}^2 xdx.$ **Жауабы:** $\ln|\sin x|-x\operatorname{ctg}x-\frac{x^2}{2}+C.$

5.11. $\int x^2e^{-x}dx.$ **Жауабы:** $C-\left(x^2+2x+2\right)e^{-x}.$

5.12. $\int\frac{xdx}{\sin^2 x}.$ **Жауабы:** $\ln|\sin x|-x\operatorname{ctg}x+C.$

5.13. $\int\frac{xdx}{\cos^2 x}.$ **Жауабы:** $x\operatorname{tg}x+\ln|\cos x|+C.$

5.14. $\int x\operatorname{tg}^2 xdx.$ **Жауабы:** $x\operatorname{tg}x+\ln|\cos x|-\frac{x^2}{2}+C.$

5.15. $\int\left(x^2+2\right)e^{-x}dx.$ **Жауабы:** $C-\left(x^2+2x+4\right)e^{-x}.$

5.16. $\int x^2\sin^2 xdx.$ **Жауабы:** $\frac{x^3}{6}-\frac{x^2}{4}\sin 2x+\frac{x}{4}\cos 2x+\frac{1}{8}\sin 2x+C.$

5.17. $\int x^2(\cos 2x+3)dx.$

Жауабы: $x^3+\frac{x^2}{2}\sin 2x+\frac{x}{2}\cos 2x-\frac{1}{4}\sin 2x+C.$

5.18. $\int\left(x^2+2\right)e^{x}dx.$ **Жауабы:** $\left(x^2-2x+4\right)e^{-x}+C.$

5.19. $\int\left(x^2+3\right)\sin xdx.$

Жауабы: $2x\sin x-\left(x^2+1\right)\cos x+C.$)

5.20. $\int\left(x^2-3\right)\cos x dx.$ **Жауабы:** $\left(x^2-4\right)\sin x+2x\cos x+C.$

5.21. $\int\left(x^2+1\right)e^{-x}dx.$ **Жауабы:** $C-\left(x^2+2x+3\right)e^{-x}.$

5.22. $\int\left(x^2-1\right)e^{x}dx.$ **Жауабы:** $\left(x-1\right)^2e^{x}+C.$

5.23. $\int x^2\cos^2 xdx.$ **Ж:** $\frac{x^3}{6}+\frac{x^2}{4}\sin 2x+\frac{x}{4}\cos 2x-\frac{1}{8}\sin 2x+C.$

5.24. $\int\left(x^2+x\right)\sin xdx.$

Жауабы: $\left(2x+1\right)\sin x-\left(x^2+x-2\right)\cos x+C.$

5.25. $\int\left(x^2+x\right)\cos xdx.$

Жауабы: $\left(x^2+x-1\right)\sin x+\left(2x+1\right)\cos x+C.$)

5.26. $\int\left(x^2+1\right)e^{x}dx.$ **Жауабы:** $\left(x^2-2x+3\right)e^{x}+C.$

5.27. $\int\left(x^2-1\right)e^{-x}dx.$ **Жауабы:** $C-\left(x+1\right)^2e^{-x}.$

5.28. $\int x\sin^2 xdx.$ **Жауабы:** $\frac{x^2}{4}-\frac{x^2}{4}\sin 2x-\frac{1}{8}\cos 2x+C.$

5.29. $\int\arcsin 9xdx.$ **Жауабы:** $x\arcsin 9x+\frac{1}{9}\sqrt{1-81x^2}+C.$

5.30. $\int x\,\mathrm{arcctg}\,2xdx.$ **Жауабы:** $\frac{x^2}{2}\mathrm{arcctg}\,2x+\frac{x}{4}+\frac{1}{8}\mathrm{arcctg}\,2x+C.$

6.

6.1. $\int\left(x+1\right)e^{2x}dx.$

6.2. $\int\left(x-2\right)e^{x}dx.$

6.3. $\int\left(x-7\right)\cos 2xdx.$

6.4. $\int\left(1-x\right)\cos 5xdx.$

6.5. $\int\left(x+2\right)\cos 3xdx.$

6.6. $\int\left(x-2\right)\cos 4xdx.$

6.7. $\int (x-4)\sin 2x dx.$

6.8. $\int (x-3)\cos x dx.$

6.9. $\int (x+4)\sin 2x dx.$

6.10. $\int x\sin 3x dx.$

6.11. $\int (x+5)\sin x dx.$

6.12. $\int (x-5)\cos x dx.$

6.13. $\int (x+9)\sin x dx.$

6.14. $\int (x+7)\sin 2x dx.$

6.15. $\int (x+4)\sin 3x dx.$

6.16. $\int (x+3)\sin 5x dx.$

6.17. $\int (x-4)\cos 2x dx.$

6.18. $\int (x-8)\sin x dx.$

6.19. $\int (x+4)\cos 3x dx.$

6.20. $\int (x+8)\sin 3x dx.$

6.21. $\int (x+6)\cos 4x dx.$

6.22. $\int (x-6)\sin \frac{x}{2} dx.$

6.23. $\int (x+1)\cos 7x dx.$

6.24. $\int (x+2)\sin \frac{x}{2} dx.$

6.25. $\int x\sin \frac{x}{5} dx.$

6.26. $\int (x+4)\cos \frac{x}{2} dx.$

6.27. $\int (x+1)\sin \frac{x}{3} dx.$

6.28. $\int (x+2)\cos \frac{x}{4} dx.$

6.29. $\int (x+3)\sin \frac{x}{4} dx.$

6.30. $\int (x-9)\sin \frac{x}{2} dx.$

7.

7.1. $\int \ln(x-5) dx.$

7.2. $\int \operatorname{arctg} 2x dx.$

7.3. $\int x^2 e^{-x} dx.$

7.4. $\int (x+1)e^{-4x} dx.$

7.5. $\int x^2 e^{-2x} dx.$

7.6. $\int \operatorname{arctg} 3x dx.$

7.7. $\int x\cos 8x dx.$

7.8. $\int \operatorname{arctg} 4x dx.$

7.9. $\int \arcsin 5x dx.$

7.10. $\int (x+1)e^{-x} dx.$

7.11. $\int x\operatorname{arctg} x dx.$

7.12. $\int x^2 e^{3x} dx.$

7.13. $\int x\cos(x+4)dx.$

7.14. $\int x\cos(x-2)dx.$

7.15. $\int x\cos(x+3)dx.$

7.16. $\int xe^{x+2}dx.$

7.17. $\int xe^{-7x}dx.$

7.18. $\int \arcsin 2xdx.$

7.19. $\int x\sin(x+7)dx.$

7.20. $\int x\cos(x-4)dx.$

7.21. $\int x\sin(x+4)dx.$

7.22. $\int x\cos(x+9)dx.$

7.23. $\int(x+3)e^{-x}dx.$

7.24. $\int \arccos xdx.$

7.25. $\int(x^2-3)e^{x}dx.$

7.26. $\int xe^{-4x}dx.$

7.27. $\int x\cos(x+7)dx.$

7.28. $\int xe^{-5x}dx.$

7.29. $\int xe^{x+3}dx.$

7.30. $\int x\cos(2-x)dx.$

8.

8.1. $\int \operatorname{arctg} 2xdx.$

8.2. $\int x\cos 6xdx.$

8.3. $\int \arcsin 3xdx.$

8.4. $\int \arccos 2xdx.$

8.5. $\int \operatorname{arctg} 8xdx.$

8.6. $\int x\sin(x-2)dx.$

8.7. $\int \arcsin 8xdx.$

8.8. $\int x\sin(x+3)dx.$

8.9. $\int x\cos(x+4)dx.$

8.10. $\int \arccos 7xdx.$

8.11. $\int x\cos(x-7)dx.$

8.12. $\int x\sin(x-5)dx.$

8.13. $\int(x-4)e^{x}dx.$

8.14. $\int xe^{-6x}dx.$

8.15. $\int \operatorname{arctg} 7xdx.$

8.16. $\int \arcsin 5xdx.$

8.17. $\int \ln(x-7)dx.$

8.18. $\int x\cos(x+6)dx.$

8.19. $\int \operatorname{arctg}\frac{x}{2}dx.$

8.20. $\int \ln(x+8)dx.$

8.21. $\int \operatorname{arctg}\frac{x}{5}dx.$

8.22. $\int \ln(x+12)dx.$

8.23. $\int \arcsin\frac{x}{5}dx.$

8.24. $\int \ln(2x-1)dx.$

8.25. $\int \ln(2x+3)dx.$

8.26. $\int \arccos\frac{x}{5}dx.$

8.27. $\int \operatorname{arctg}\frac{x}{4}dx.$

8.28. $\int \arcsin\frac{x}{7}dx.$

8.29. $\int \operatorname{arctg} 6xdx.$

8.30. $\int \arccos\frac{x}{3}dx.$

7.3- YT шығару үлгісі

Анықталмаған интегралды табыңыз

1. $\int x^2\sqrt{16-x^2}dx.$

► $\int x^2\sqrt{16-x^2}dx = \left|\begin{array}{l} x=4\sin t, dx=4\cos tdt, \\ \sin t=\frac{x}{4}, t=\arcsin\frac{x}{4} \end{array}\right| =$

$$= \int 16\sin^2 t\sqrt{16-16\sin^2 t}\,4\cos tdt = 256\int \sin^2 t\cos^2 tdt =$$

$$= 64\int \sin^2 t 2tdt = 32\int(1-\cos 4t)dt = 32t - 8\sin 4t + C =$$

$$= 32\arcsin\frac{x}{4} - 8\sin 4\left(\arcsin\frac{x}{4}\right) + C =$$

$$= 32\arcsin\frac{x}{4} - \frac{x}{4}\left(8-x^2\right)\sqrt{16-x^2} + C. \quad ◄$$