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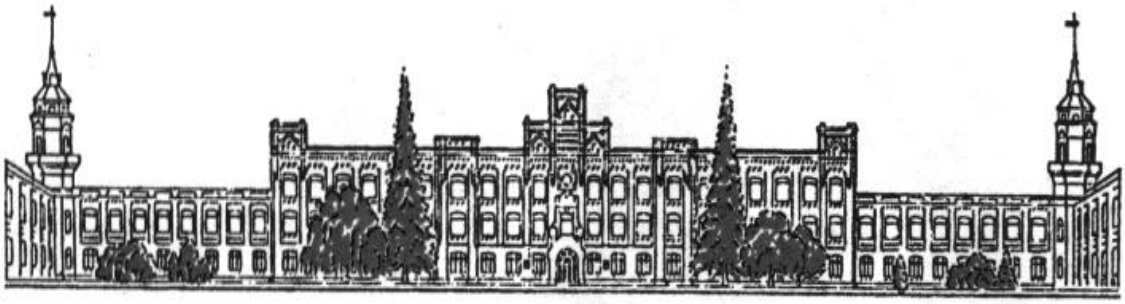
NATIONAL TECHNICAL UNIVERSITY OF UKRAINE
“IGOR SIKORSKY KYIV POLYTECHNIC INSTITUTE”



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HIGHER MATHEMATICS

INDEFINITE INTEGRAL

Practicum

Recommended by the Methodological Council of Igor Sikorsky Kyiv Polytechnic Institute
as a study aid for bachelor's applicants
of the technical specialties

Electronic network educational edition

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Practicum offers additional individual exercises for university students studying Indefinite Integral in the course of Higher Mathematics of Igor Sikorsky Kyiv Polytechnic Institute. The study aid contains 31 different variants and each variant consists of 36 tasks. Students master the material being studied and consolidate the acquired knowledge by solving such individual tasks. The practicum can be recommended as an individual work on Indefinite Integral for the first-year students of technical specialties.

UDC 517.31

Indefinite integral

CONTENT

Indefinite integral

INTRODUCTION

Indefinite Integral is included in the course of Higher Mathematics for engineering students of Igor Sikorsky Kyiv Polytechnic Institute. An important factor in the successful assimilation of the educational material by the students is solving practical tasks on their own.

This practicum offers a systematized set of exercises that students of technical specialties should be able to solve when studying Indefinite Integral. The study aid contains 31 different variants and each variant consists of 36 tasks.

The practicum helps students to develop practical skills in calculating indefinite integrals using basic integration methods such as substitution and change of variables; integration by parts; integration of rational functions based on partial fraction decomposition; integration using trigonometric identities and trigonometric substitutions; integration of irrational functions and binomial differentials.

The practicum can be recommended as an individual work on Indefinite Integral for the first-year students of technical specialties.

Indefinite integral

GENERAL RECOMMENDATIONS

Practicum is designed to control and improve the knowledge of university students in the study of Indefinite Integral in the course of Higher Mathematics. The main goal is to develop and consolidate the skills of independent work of students in the study of educational material.

In order to successfully complete the exercises, students need to thoroughly study the lecture material and analyze the examples solved in practical classes. Only after that students can start solving their individual tasks.

Students have to adhere to the following requirements:

1. The number of the variant of the individual exercises corresponds to the ordinal number of the student in the list of the study group;
2. Individual work is written in a separate notebook, which should contain:
    - the title page;
    - the results table;
    - solved exercises (the solution of each exercise starts from a new page).
3. Before solving each exercise, the condition and all specific data for the corresponding variant are completely rewritten.
4. The solution of each task must contain detailed explanations and necessary formulas.
5. Completed work must be handed over to the teacher for verification within the prescribed time limit.

Students who do not submit their completed individual work on time will not be allowed to take the exam.

Indefinite integral

Variant №1

Calculate indefinite integrals. In tasks 1-6, you need to check the correctness of the integration operation using differentiation.

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

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

3. $\int x\,9^{x^2}\,dx$

4. $\int \frac{\mathrm{ctg}^{\frac{4}{3}} x}{\sin^2 x}\,dx$

5. $\int \frac{8x^3\,dx}{\sqrt{4-x^8}}$

6. $\int \frac{(-4x^3-6x+5)\,dx}{(3-5x+3x^2+x^4)^3}$

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

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

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

10. $\int \frac{(3x-1)\,dx}{\sqrt{x^2+2x+2}}$

11. $\int \sqrt{x^2+x-6}\,dx$

12. $\int \sqrt{x-4x^2}\,dx$

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

14. $\int \frac{x+1}{x\sqrt{x-2}}\,dx$

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

16. $\int x\sin x\cos x\,dx$

17. $\int x\,\mathrm{arctg}(x+1)\,dx$

18. $\int x^3 \arccos x^4\,dx$

19. $\int \frac{\ln(2+x)}{(2+x)^3}\,dx$

20. $\int (x^2-2x+5)e^{3x}\,dx$

21. $\int \frac{9x^2-14x+1}{x^3-2x^2-x+2}\,dx$

22. $\int \frac{x+2}{x^3+8x^2+16x}\,dx$

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

24. $\int \frac{(17x+23)\,dx}{(3-x)(x^2+6x+10)}$

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

26. $\int \frac{xdx}{(x^2-x-2)^2}$

27. $\int \sin 7x\cos 5x\,dx$

28. $\int \cos^2\frac{x}{5}\,dx$

29. $\int \sin^3\frac{3x}{8}\,dx$

30. $\int \cos^4 4x\,dx$

31. $\int \sin^2 2x\cdot\cos^3 2x\,dx$

32. $\int \frac{dx}{4+5\sin x}$

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

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

35. $\int \frac{dx}{(x-1)\sqrt{6x-x^2-5}}$

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

Indefinite integral

Variant №2

Calculate indefinite integrals. In tasks 1-6, you need to check the correctness of the integration operation using differentiation.

1. $\int \frac{x^3+2x}{x^4+16}\,dx$
2. $\int \frac{4+\sin 4x}{\cos^2 4x}\,dx$
3. $\int \frac{dx}{\sqrt{16-25x^2}}$
4. $\int \frac{4x+\sqrt{\arcsin x}}{\sqrt{1-x^2}}\,dx$
5. $\int \frac{dx}{\sqrt{e^{8x-1}}}$
6. $\int \frac{x+5}{\sqrt{11-10x-x^2}}\,dx$
7. $\int \frac{dx}{x^2+7x+12}$
8. $\int \frac{dx}{\sqrt{8-7x-x^2}}$
9. $\int \frac{5-x}{2x^2+x-1}\,dx$
10. $\int \frac{2x+3}{\sqrt{4x^2-15+4x}}\,dx$
11. $\int \sqrt{x^2+5x+6}\,dx$
12. $\int \sqrt{2-x-x^2}\,dx$
13. $\int \frac{x^2\,dx}{\sqrt{2-x-x^2}}$
14. $\int \frac{dx}{x\sqrt{x+9}}$
15. $\int \frac{x-4}{\sqrt[3]{x-3}-1}\,dx$
16. $\int (2x+1)\cos 2x\,dx$
17. $\int \ln(9x^2+1)\,dx$
18. $\int x\,\mathrm{arctg}\,5x\,dx$
19. $\int \frac{x}{\cos^2 4x}\,dx$
20. $\int (x^2-2)e^{7x}\,dx$
21. $\int \frac{-x^2+x-10}{(x^2-1)(x+4)}\,dx$
22. $\int \frac{x\,dx}{(x-1)(x+3)^3}$
23. $\int \frac{(x^2+7x+8)\,dx}{(x-2)(x^2+2x+5)}$
24. $\int \frac{(3x-7)\,dx}{x^3+x^2+4x+4}$
25. $\int \frac{x^2+2x+2}{x^2+3x+6}\,dx$
26. $\int \frac{dx}{(x^2+4)^3}$
27. $\int \sin 3x \sin 7x\,dx$
28. $\int \cos^2 \frac{4x}{3}\,dx$
29. $\int \sin^3 3x\,dx$
30. $\int \cos^4 \frac{x}{3}\,dx$
31. $\int \sin^3 2x \cos^2 x\,dx$
32. $\int \frac{dx}{2-3\sin x+\cos x}$
33. $\int \frac{dx}{\sin^2 x-2\sin 2x+5\cos^2 x}$
34. $\int \frac{x^4\,dx}{\sqrt{(1-x^2)^3}}$
35. $\int \frac{dx}{x\sqrt{3x^2-x-4}}$
36. $\int \frac{\sqrt[4]{(1+\sqrt[3]{x})^3}}{x\sqrt[12]{x^7}}\,dx$

Indefinite integral

Variant №3

Calculate indefinite integrals. In tasks 1-6, you need to check the correctness of the integration operation using differentiation.

1. $\int \frac{2x^2-5}{x^2(x^2-5)}\,dx$
2. $\int e^{\frac{9}{x^2}} \frac{dx}{x^3}$
3. $\int \sqrt{\frac{\arccos^5 x}{1-x^2}}\,dx$
4. $\int \frac{\sec^2 3x}{3-\operatorname{tg} 3x}\,dx$
5. $\int \frac{dx}{(1+x^2)\operatorname{arcctg} x}$
6. $\int \frac{(3+3x)\,dx}{(3x^2+6x-5)^2}$
7. $\int \frac{dx}{9x^2+4x-5}$
8. $\int \frac{dx}{\sqrt{x^2+2x-3}}$
9. $\int \frac{3-7x}{x^2+3x-10}\,dx$
10. $\int \frac{x\,dx}{\sqrt{x^2+4x+5}}$
11. $\int \sqrt{x^2-5x+4}\,dx$
12. $\int \sqrt{1-x-2x^2}\,dx$
13. $\int \frac{x^2\,dx}{\sqrt{6x^2+2x-4}}$
14. $\int \frac{dx}{\sqrt{x}-\sqrt[3]{x}}$
15. $\int \frac{dx}{2+\sqrt{x+1}}$
16. $\int (x-5)\sin 5x\,dx$
17. $\int x \operatorname{arctg} 4x\,dx$
18. $\int (x+5)e^{5x}\,dx$
19. $\int x^3 \ln^2 4x\,dx$
20. $\int \frac{x\,dx}{\cos^2 x}$
21. $\int \frac{6x^2-3x-15}{(x^2+x-2)(x-3)}\,dx$
22. $\int \frac{x^2-7x+28}{(x+4)(x-2)^2}\,dx$
23. $\int \frac{(8x-2)\,dx}{(x+3)(x^2-4x+5)}$
24. $\int \frac{(x^2+4)\,dx}{(x-3)(x^2+6x+12)}$
25. $\int \frac{x^2+4x+11}{x^2-5x+7}\,dx$
26. $\int \frac{dx}{(x^2-2x+5)^2}$
27. $\int \cos 3x \cos 7x\,dx$
28. $\int \cos^2 \frac{x}{7}\,dx$
29. $\int \sin^3 \frac{x}{2}\,dx$
30. $\int \cos^4 4x\,dx$
31. $\int \frac{\sin^3 x}{\cos^5 x}\,dx$
32. $\int \frac{dx}{3+5\cos x}$
33. $\int \frac{dx}{2+\operatorname{tg} x}$
34. $\int \frac{x^2}{\sqrt{(2-x^2)^3}}\,dx$
35. $\int \frac{dx}{x\sqrt{x^2+2x}}$
36. $\int \frac{\sqrt[5]{(1+\sqrt[3]{x})^4}}{x\sqrt[5]{x^3}}\,dx$

Indefinite integral

Variant №4

Calculate indefinite integrals. In tasks 1-6, you need to check the correctness of the integration operation using differentiation.

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

2. $\int e^{-\operatorname{tg} x}\frac{dx}{\cos^2 x}$

3. $\int \frac{3^x\,dx}{\sqrt{4-9^x}}$

4. $\int \frac{x\ln(4+x^2)}{4+x^2}\,dx$

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

6. $\int \frac{2x-5}{(-x^2+5x-3)^7}\,dx$

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

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

9. $\int \frac{(3-7x)\,dx}{x^2+3x-4}$

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

11. $\int \sqrt{x^2+2x}\,dx$

12. $\int \sqrt{x-x^2+2}\,dx$

13. $\int \frac{x^2\,dx}{\sqrt{x^2+6x+10}}$

14. $\int \frac{2-x}{1+\sqrt{x}}\,dx$

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

16. $\int (x+4)e^{4x}\,dx$

17. $\int x\cos^2\frac{x}{2}\,dx$

18. $\int x^2\ln^2 x\,dx$

19. $\int \frac{\operatorname{arctg}\sqrt{x-1}}{\sqrt{x-1}}\,dx$

20. $\int \arccos 2x\,dx$

21. $\int \frac{(x^2-6x-11)\,dx}{(x^2-2x-3)(x+2)}$

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

23. $\int \frac{(5x+26)\,dx}{(2-x)(x^2+2x+10)}$

24. $\int \frac{(x^2+x+1)\,dx}{x(x^2+6x+11)}$

25. $\int \frac{x^4+x^2+32}{x^2+4x+5}\,dx$

26. $\int \frac{dx}{(x^2+2x+10)^3}$

27. $\int \sin 5x\cdot\sin 10x\,dx$

28. $\int \cos^2 3x\,dx$

29. $\int \cos^3\frac{3}{4}x\,dx$

30. $\int \sin^4\frac{1}{6}x\,dx$

31. $\int \frac{\sin^3 x}{\sqrt[5]{\cos^2 x}}\,dx$

32. $\int \frac{dx}{5\sin x+3\cos x-4}$

33. $\int \frac{dx}{\sin^2 x-7\sin x\cdot\cos x}$

34. $\int x^2\sqrt{4-x^2}\,dx$

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

36. $\int \frac{\sqrt[3]{(1+\sqrt[3]{x})^2}}{x\sqrt[9]{x^5}}\,dx$

Indefinite integral

Variant №5

Calculate indefinite integrals. In tasks 1-6, you need to check the correctness of the integration operation using differentiation.

1. $\int \frac{x+(\arccos 4x)^5}{\sqrt{1-4x^2}}\,dx$
2. $\int \frac{9^x\,dx}{\sqrt{16-9^{2x}}}$
3. $\int x\operatorname{ctg}(x^2+1)\,dx$
4. $\int \frac{dx}{\cos\frac{x}{4}-1}$
5. $\int \frac{(-1-8x)\,dx}{(4x^2+x-1)^5}$
6. $\int \frac{16x\,dx}{\sqrt{x^4-81}}$
7. $\int \frac{dx}{\sqrt{6+5x-x^2}}$
8. $\int \frac{dx}{x^2+x-2}$
9. $\int \frac{3-2x}{2x^2+3x+2}\,dx$
10. $\int \frac{4-3x}{\sqrt{x^2-x-6}}\,dx$
11. $\int \sqrt{x^2-2x-8}\,dx$
12. $\int \sqrt{x-x^2}\,dx$
13. $\int \frac{x^2\,dx}{\sqrt{x^2-5x+4}}$
14. $\int \frac{\sqrt{x}+4}{x+1}\,dx$
15. $\int \frac{dx}{\sqrt{x+1}(\sqrt[4]{x+1}-1)}$
16. $\int (5x-2)\mathrm{e}^{3x}\,dx$
17. $\int \operatorname{arctg}\sqrt{7x-1}\,dx$
18. $\int (x+1)\sin^2 x\,dx$
19. $\int (x^2+2x)\ln x\,dx$
20. $\int \frac{\arcsin\sqrt{x}}{\sqrt{1-x}}\,dx$
21. $\int \frac{x^2+1}{x^3-9x}\,dx$
22. $\int \frac{(2x+6)\,dx}{(x-5)(x-3)^2}$
23. $\int \frac{x+3}{1-x^4}\,dx$
24. $\int \frac{(x^2-7x-8)\,dx}{(x-2)(x^2+2x+10)}$
25. $\int \frac{x^3+2x+3}{x^2+5x+7}\,dx$
26. $\int \frac{x\,dx}{(x^2+x-12)^2}$
27. $\int \cos 7x\sin 3x\,dx$
28. $\int \sin^2\frac{2}{5}x\,dx$
29. $\int \cos^3\frac{3}{7}x\,dx$
30. $\int \sin^4 8x\,dx$
31. $\int \frac{\cos^5 4x}{\sin^2 4x}\,dx$
32. $\int \frac{dx}{5+6\cos x}$
33. $\int \frac{dx}{8-6\sin^2 x+5\cos^2 x}$
34. $\int \frac{dx}{x\sqrt{2-x^2+x}}$
35. $\int \frac{dx}{x^4\sqrt{x^2-9}}$
36. $\int \frac{\sqrt[3]{(1+\sqrt{x})^2}}{x\sqrt[6]{x^5}}\,dx$

Indefinite integral

Variant №6

Calculate indefinite integrals. In tasks 1-6, you need to check the correctness of the integration operation using differentiation.

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

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

3. $\int \frac{\ln^4 x + 9\sqrt[3]{x}}{x}\, dx$

4. $\int \frac{e^x\, dx}{\sqrt{81 - e^{2x}}}$

5. $\int \frac{8x + 1}{\sqrt{4x^2 + x + 5}}\, dx$

6. $\int \frac{3 + 8x}{2 - 3x - 4x^2}\, dx$

7. $\int \frac{dx}{x + x^2 - 12}$

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

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

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

11. $\int \sqrt{x^2 - 2x - 3}\, dx$

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

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

14. $\int \frac{5\sqrt{x}}{1 + \sqrt{x}}\, dx$

15. $\int \frac{dx}{(\sqrt[4]{x + 3} - 1)\sqrt{x + 3}}$

16. $\int \operatorname{arctg} \sqrt{9x - 1}\, dx$

17. $\int (x^2 + 3x + 2) \ln x\, dx$

18. $\int \arcsin x\, dx$

19. $\int (x + 1) \cos 2x\, dx$

20. $\int x^2\, e^{5x+1}\, dx$

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

22. $\int \frac{3x^2 - 3x - 4}{(x - 1)^2 (x + 3)}\, dx$

23. $\int \frac{(11 - 6x)\, dx}{(x + 1)(x^2 - 6x + 10)}$

24. $\int \frac{5x^3 + x^2 + 12x - 4}{x^4 - 16}\, dx$

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

26. $\int \frac{5x^2 - 12}{(x^2 - 6x + 13)^2}\, dx$

27. $\int \sin \frac{x}{5} \cos \frac{x}{4}\, dx$

28. $\int \sin^2 6x\, dx$

29. $\int \cos^3 \frac{x}{2}\, dx$

30. $\int \sin^4 \frac{x}{8}\, dx$

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

32. $\int \frac{dx}{5 - 3\cos x}$

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

34. $\int \frac{\sqrt{49 + x^2}}{x^2}\, dx$

35. $\int \frac{dx}{x\sqrt{2 + x - x^2}}$

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

Indefinite integral

Variant №7

Calculate indefinite integrals. In tasks 1-6, you need to check the correctness of the integration operation using differentiation.

1. $\int \frac{e^x\,dx}{\sqrt{25e^{2x}+4}}$
2. $\int \frac{\sin 2x\,dx}{\sqrt[4]{\cos 2x+2}}$
3. $\int \frac{5\sqrt{x}+\ln^{14} x}{x}\,dx$
4. $\int \frac{dx}{\sin^2 5x(2+\operatorname{ctg} 5x)^5}$
5. $\int \operatorname{ctg}^4 x\,dx$
6. $\int \frac{(-1-6x)\,dx}{\sqrt{3x^2+x+27}}$
7. $\int \frac{dx}{\sqrt{60+3x-3x^2}}$
8. $\int \frac{dx}{x^2+4x+20}$
9. $\int \frac{x+4}{\sqrt{2x^2-3x-5}}\,dx$
10. $\int \frac{x+1}{3x^2+x-2}\,dx$
11. $\int \sqrt{3x^2+2x-21}\,dx$
12. $\int \sqrt{3-2x-x^2}\,dx$
13. $\int \frac{x^2\,dx}{\sqrt{-x^2+3x+4}}$
14. $\int \frac{dx}{(x-1)(x+4)\sqrt{x}}$
15. $\int \frac{\sqrt[3]{1+x}}{1+\sqrt[3]{1+x}}\,dx$
16. $\int e^{-4x}(1-16x)\,dx$
17. $\int \operatorname{arctg}\sqrt{2x-1}\,dx$
18. $\int (x^2-2x+5)\ln x\,dx$
19. $\int (x^2+3)\cos 3x\,dx$
20. $\int \frac{\arcsin\sqrt{x}}{\sqrt{x}}\,dx$
21. $\int \frac{(x^2+3x-1)\,dx}{(x+1)(x^2-8x+12)}$
22. $\int \frac{(5x+2)\,dx}{x^3+8x^2+16x}$
23. $\int \frac{(x^2+16x-19)\,dx}{(x+1)(x^2-6x+10)}$
24. $\int \frac{(7x+16)\,dx}{x^3-2x^2+x-2}$
25. $\int \frac{7x^3+x^2+1}{x^2+2x+5}\,dx$
26. $\int \frac{2-3x}{(x^2+5x+4)^2}\,dx$
27. $\int \sin 4x \sin 9x\,dx$
28. $\int \cos^2 \frac{5}{4}x\,dx$
29. $\int \sin^3 6x\,dx$
30. $\int \cos^4 \frac{5}{4}x\,dx$
31. $\int \sin^4 x \cos^5 x\,dx$
32. $\int \frac{dx}{3\sin x-4\cos x}$
33. $\int \frac{dx}{3+5\cos^2 x}$
34. $\int \frac{3x^4}{\sqrt{(8-x^2)^3}}\,dx$
35. $\int \frac{dx}{x\sqrt{x^2+2x+5}}$
36. $\int \frac{\sqrt[5]{(1+\sqrt[4]{x^3})^4}}{x^2\sqrt[20]{x^7}}\,dx$

Indefinite integral

Variant №8

Calculate indefinite integrals. In tasks 1-6, you need to check the correctness of the integration operation using differentiation.

1. $\int \frac{dx}{\cos^2 4x\,(\mathrm{tg}^2 4x - 4)}$
2. $\int x^6\, e^{x^7+7}\, dx$
3. $\int \frac{\cos 5x}{\sqrt[3]{\sin^4 5x}}\, dx$
4. $\int \frac{\mathrm{arctg}\, 7x + 7x}{1+49x^2}\, dx$
5. $\int \mathrm{ctg}^4 \frac{x}{4} dx$
6. $\int \frac{(-5-8x)}{\sqrt{4x^2+5x+2}}\, dx$
7. $\int \frac{dx}{x^2-3x-4}$
8. $\int \frac{dx}{\sqrt{-3x^2+x}}$
9. $\int \frac{x+7}{x^2+4x+29}\, dx$
10. $\int \frac{(4-x)\, dx}{\sqrt{3-2x-x^2}}$
11. $\int \sqrt{7x+x^2}\, dx$
12. $\int \sqrt{-4x^2+8x+12}\, dx$
13. $\int \frac{x^2\, dx}{\sqrt{15-2x-x^2}}$
14. $\int \frac{4\, dx}{\sqrt{x}+\sqrt[3]{x}}$
15. $\int \frac{dx}{x(\sqrt{x+4}-1)}$
16. $\int (5x+10)\, e^{5x}\, dx$
17. $\int \mathrm{arctg}\sqrt{3x-1}\, dx$
18. $\int (x+4)\sin^2 4x\, dx$
19. $\int \arcsin \frac{x}{5}\, dx$
20. $\int \frac{x \ln x}{(1+x^2)^2}\, dx$
21. $\int \frac{(x^2+4)\, dx}{(x+3)(x^2-5x-6)}$
22. $\int \frac{(x^2+1)\, dx}{x^3-3x^2+3x-1}$
23. $\int \frac{(12x+4)\, dx}{(1-x)(x^2+4x+13)}$
24. $\int \frac{x\, dx}{(x^2+2)(x-1)^2}$
25. $\int \frac{x^3-x^2+x+1}{4x^2+4x+3}\, dx$
26. $\int \frac{(x^2+1)\, dx}{(x-3)(x^2+9)^2}$
27. $\int \cos\frac{x}{2} \sin 4x\, dx$
28. $\int \cos^2 \frac{3}{5} x\, dx$
29. $\int \sin^3 7x\, dx$
30. $\int \cos^4 \frac{4}{5} x\, dx$
31. $\int \sin^5 x \sqrt[3]{\cos x}\, dx$
32. $\int \frac{dx}{3+\sin x+2\cos x}$
33. $\int \frac{\cos x\, dx}{\sin^3 x - \cos^3 x}$
34. $\int \frac{5x^2}{\sqrt{(4+x^2)^5}}\, dx$
35. $\int \frac{dx}{x\sqrt{1+x^2}}$
36. $\int \frac{\sqrt{1+x}}{x^2\sqrt{x}}\, dx$

Indefinite integral

Variant №9

Calculate indefinite integrals. In tasks 1-6, you need to check the correctness of the integration operation using differentiation.

1. $\int e^{-5x}(5-e^{-5x})^5\,dx$

2. $\int \frac{2x+\arccos^3 4x}{\sqrt{1-16x^2}}\,dx$

3. $\int \frac{dx}{\mathrm{tg}^5 x\cos^2 x}$

4. $\int \frac{8x-3}{\sqrt{1-3x+4x^2}}\,dx$

5. $\int \frac{dx}{(x+8)\ln^9(x+8)}$

$\int \frac{x\,dx}{\sqrt{x^4-49}}$

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

7. $\int \frac{dx}{x^2+4x+29}$

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

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

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

11. $\int \sqrt{x^2+5x}\,dx$

12. $\int \sqrt{x-x^2+12}\,dx$

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

14. $\int \frac{dx}{x+4\sqrt[4]{x}}$

15. $\int \frac{\sqrt{x+1}}{\sqrt[3]{x+1}-1}\,dx$

16. $\int e^{-3x}(1-9x)\,dx$

17. $\int \mathrm{arctg}\sqrt{8x-1}\,dx$

18. $\int (x^2+x)\sin x\,dx$

19. $\int \frac{\ln x+1}{x^3}\,dx$

20. $\int e^{3x}\cos 3x\,dx$

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

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

23. $\int \frac{(12x+3)\,dx}{(x+2)(x^2+3)}$

24. $\int \frac{(x^2+16x-19)\,dx}{(x+1)(x^2-6x+10)}$

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

26. $\int \frac{x\,dx}{(x^2+4x+40)^2}$

27. $\int \cos\frac{5x}{2}\sin\frac{3x}{2}\,dx$

28. $\int \sin^2 7x\,dx$

29. $\int \cos^3\frac{5}{2}x\,dx$

30. $\int \sin^4 2x\,dx$

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

32. $\int \frac{1-\cos x}{1+\cos x}\,dx$

33. $\int \frac{dx}{4-\cos^2 x+5\sin^2 x}$

34. $\int x^2\sqrt{16-x^2}\,dx$

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

36. $\int \frac{\sqrt[3]{(1+\sqrt[5]{x^4})^2}}{x^2\sqrt[3]{x}}\,dx$

Indefinite integral

Variant №10

Calculate indefinite integrals. In tasks 1-6, you need to check the correctness of the integration operation using differentiation.

1. $\int \frac{x+(\arccos 5x)^5}{\sqrt{1-25x^2}}\,dx$
2. $\int e^{5x}\sqrt{1-e^{5x}}\,dx$
3. $\int \frac{\sin\frac{x}{6}\,dx}{\sqrt{\cos^2\frac{x}{6}+6}}$
4. $\int \frac{dx}{5x^2-49}$
5. $\int \frac{x\,dx}{\sqrt{9+x^2}}$
6. $\int \frac{(1-2x)\,dx}{(2x^2-2x+7)^9}$
7. $\int \frac{dx}{x^2+5x-4}$
8. $\int \frac{dx}{\sqrt{3-x-4x^2}}$
9. $\int \frac{2-5x}{3x^2+2x-1}\,dx$
10. $\int \frac{x\,dx}{\sqrt{x^2-6x+25}}$
11. $\int \sqrt{x^2+x-2}\,dx$
12. $\int \sqrt{8+7x-x^2}\,dx$
13. $\int \frac{x^2\,dx}{\sqrt{x^2+5x+4}}\,dx$
14. $\int \frac{\sqrt{x+9}}{6+\sqrt{x+9}}\,dx$
15. $\int \frac{\sqrt[6]{x}\,dx}{\sqrt[3]{x^2}-\sqrt{x}}$
16. $\int (x-3)\cos 2x\,dx$
17. $\int \operatorname{arctg}\sqrt{7x-1}\,dx$
18. $\int \frac{x\,dx}{\sin^2\frac{x}{7}}$
19. $\int x^2\ln(7+x)\,dx$
20. $\int (x^3+x)e^{-x^2}\,dx$
21. $\int \frac{dx}{4x^3-x}$
22. $\int \frac{(x^2+1)\,dx}{8-12x+6x^2-x^3}$
23. $\int \frac{(7x+11)\,dx}{(1-x)(4x^2+4x+10)}$
24. $\int \frac{(3x^2-x+6)\,dx}{(x+2)^2(x^2+6x+13)}$
25. $\int \frac{x^3-3x^2+x-9}{x^2+5x+11}\,dx$
26. $\int \frac{x^3\,dx}{(x+1)(x^2+4)^2}$
27. $\int \sin 5x\sin 6x\,dx$
28. $\int \cos^2\frac{x}{8}\,dx$
29. $\int \sin^3\frac{2}{3}x\,dx$
30. $\int \cos^4 3x\,dx$
31. $\int \cos x\sin^2 2x\,dx$
32. $\int \frac{(2-\sin x)\,dx}{2+\cos x}$
33. $\int \frac{dx}{1-\sin^4 x}$
34. $\int x^3\sqrt{5-x^2}\,dx$
35. $\int \frac{dx}{x\sqrt{4-x^2}}$
36. $\int \frac{\sqrt[3]{(1+\sqrt[3]{x^2})^2}}{x^2\sqrt[9]{x}}\,dx$

Indefinite integral

Variant №11

Calculate indefinite integrals. In tasks 1-6, you need to check the correctness of the integration operation using differentiation.

1. $\int \frac{x^4 dx}{\sin^2(1+2x^5)}$

2. $\int x^2 \sqrt[5]{1-4x^3}\, dx$

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

4. $\int \frac{1-4\cos x}{\sin^2 x}\, dx$

5. $\int \frac{(\arccos x)^4 - 1}{\sqrt{1-x^2}}\, dx$

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

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

8. $\int \frac{dx}{\sqrt{x^2+6x+10}}$

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

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

11. $\int \sqrt{x^2+8x+25}\, dx$

12. $\int \sqrt{16-6x-x^2}\, dx$

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

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

15. $\int \frac{x\, dx}{\sqrt{4+x}-\sqrt[3]{x+4}}$

16. $\int (4-5x)e^{-5x}\, dx$

17. $\int \operatorname{arctg}\sqrt{6x-1}\, dx$

18. $\int \ln(x+\sqrt{1+x^2})\, dx$

19. $\int x\cos^2(4x+1)\, dx$

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

21. $\int \frac{(x^2-x+2)dx}{(x-1)(x^2+12x+11)}$

22. $\int \frac{x^3-2x^2+4}{x^3(x-2)}\, dx$

23. $\int \frac{(17x+23)\, dx}{(3-x)(x^2+6x+10)}$

24. $\int \frac{3x+1}{x^3+1}\, dx$

25. $\int \frac{3x^3-x}{x^2+4x+16}\, dx$

26. $\int \frac{1-2x}{(x^2+6x+10)^2}\, dx$

27. $\int \cos\frac{x}{2}\cos\frac{7x}{2}\, dx$

28. $\int \sin^2 3x\, dx$

29. $\int \cos^3 6x\, dx$

30. $\int \sin^4 \frac{4}{5}x\, dx$

31. $\int \frac{\sin^4 x}{\cos^2 x}\, dx$

32. $\int \frac{dx}{4-4\cos x+\sin x}$

33. $\int \frac{dx}{3+\operatorname{tg} x}$

34. $\int \frac{x^6 dx}{\sqrt{(64-x^2)^3}}$

35. $\int \frac{dx}{(x+1)\sqrt{1+x+x^2}}$

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

Indefinite integral

Variant №12

Calculate indefinite integrals. In tasks 1-6, you need to check the correctness of the integration operation using differentiation.

1. $\int \frac{dx}{x\sin^2(1+2\ln x)}$
2. $\int (x^2-2x)\,e^{x^3-3x^2}\,dx$
3. $\int x\operatorname{ctg} x^2\,dx$
4. $\int \frac{x^3+x^7}{\sqrt{x^8+16}}\,dx$
5. $\int \frac{\ln x\,dx}{x\sqrt{\ln^2 x+1}}$
6. $\int \frac{dx}{\cos^4\frac{x}{2}}$
7. $\int \frac{dx}{2x^2+3x-5}$
8. $\int \frac{dx}{\sqrt{7+6x-x^2}}$
9. $\int \frac{(1+2x)\,dx}{x^2+x-6}$
10. $\int \frac{(x-3)\,dx}{\sqrt{7+6x-x^2}}$
11. $\int \sqrt{x^2+6x+18}\,dx$
12. $\int \sqrt{5x-x^2-4}\,dx$
13. $\int \frac{x^2\,dx}{\sqrt{x^2+3x-4}}$
14. $\int \frac{\sqrt{x}}{x-\sqrt[3]{x^2}}dx$
15. $\int \frac{(\sqrt{x-4}-4)\,dx}{2\sqrt{x-4}-\sqrt[3]{(x-4)^2}}$
16. $\int (2-3x)\,e^{-3x}\,dx$
17. $\int (4x-2)\sin 2x\,dx$
18. $\int \operatorname{arctg}\frac{x}{5}dx$
19. $\int (x+1)^2\cos^2 x\,dx$
20. $\int \frac{\ln x}{(4+x)^2}\,dx$
21. $\int \frac{(x^2-2x-2)\,dx}{(x^2-6x-16)x}$
22. $\int \frac{x+2}{x(x+1)^2}\,dx$
23. $\int \frac{(17x+23)\,dx}{(3-x)(x^2+6x+10)}$
24. $\int \frac{3x^2-4x+26}{x^2(x^2-4x+13)}\,dx$
25. $\int \frac{4x^3-2x^2+5x}{x^2+5x-16}\,dx$
26. $\int \frac{(x+3)\,dx}{(x^2+6x-16)^2}$
27. $\int \cos 2x\cos 3x\,dx$
28. $\int \cos^2\frac{4}{5}x\,dx$
29. $\int \sin^3\frac{5}{2}x\,dx$
30. $\int \sin^4 x\cdot\cos^4 x\,dx$
31. $\int \frac{\sin^3 2x}{\cos^4 2x}\,dx$
32. $\int \frac{\sin x\,dx}{\sin x+3\cos x}$
33. $\int \frac{dx}{1+\cos^2 x}$
34. $\int \frac{x^3\,dx}{\sqrt{9-x^2}}$
35. $\int \frac{dx}{(x-1)\sqrt{x^2-3x+2}}$
36. $\int \frac{\sqrt[4]{1+\sqrt[3]{x^2}}}{x\sqrt[6]{x^5}}\,dx$

Indefinite integral

Variant №13

Calculate indefinite integrals. In tasks 1-6, you need to check the correctness of the integration operation using differentiation.

1. $\int \frac{4^{3+2\operatorname{ctg}2x}}{\sin^2 2x}\,dx$
2. $\int \frac{\sin 2x}{7+\cos^2 x}\,dx$
3. $\int e^{4x^2+\ln x}\,dx$
4. $\int \frac{dx}{x\sqrt{9-\ln^2 x}}$
5. $\int \frac{-4x^3-15x^2}{(x^4+5x^3+7)^5}\,dx$
6. $\int \frac{-x^3 dx}{9x^8-25}$
7. $\int \frac{dx}{x^2-5x+4}$
8. $\int \frac{dx}{\sqrt{x^2+4x-5}}$
9. $\int \frac{(3-5x)\,dx}{x^2+2x-3}$
10. $\int \frac{(3x+1)\,dx}{\sqrt{4x^2-4x+17}}$
11. $\int \sqrt{x^2+7x+10}\,dx$
12. $\int \sqrt{-x^2+3x+4}\,dx$
13. $\int \frac{x^2\,dx}{\sqrt{3-4x-2x^2}}$
14. $\int \frac{\sqrt{x}}{\sqrt[4]{x^3}+8}\,dx$
15. $\int \frac{x\,dx}{\sqrt{1+x}+\sqrt[3]{1+x}}$
16. $\int (4-3x)e^{-3x}\,dx$
17. $\int (5-25x)\sin 5x\,dx$
18. $\int \ln(x+10)\,dx$
19. $\int x\cos^2(4x+1)\,dx$
20. $\int \frac{\arccos x}{\sqrt{1+x}}\,dx$
21. $\int \frac{(x+3)\,dx}{x^3+7x^2+6x}$
22. $\int \frac{x\,dx}{(x-1)(x+1)^2}$
23. $\int \frac{(x^2+3)\,dx}{(x+1)^2(x^2+1)}$
24. $\int \frac{(x^2+7x-15)\,dx}{(x+2)(x^2-2x+17)}$
25. $\int \frac{3x^3+2x^2+5}{x^2-3x+9}\,dx$
26. $\int \frac{(2-5x)\,dx}{(x^2+x-2)^2}$
27. $\int \cos 2x\cos 6x\,dx$
28. $\int \cos^2 \frac{7}{5}x\,dx$
29. $\int \sin^3 \frac{3}{7}x\,dx$
30. $\int \cos^4 9x\,dx$
31. $\int \cos^2 x\sin^7 x\,dx$
32. $\int \frac{dx}{3\cos x-6}$
33. $\int \frac{dx}{2\sin^2 x-3\sin x\cos x-\cos^2 x}$
34. $\int \frac{2x\,dx}{\sqrt{(16-x^2)^3}}$
35. $\int \frac{dx}{x\sqrt{x^2-6x-7}}$
36. $\int \frac{\sqrt[3]{1+\sqrt[5]{x}}}{x\sqrt[15]{x^4}}\,dx$

Indefinite integral

Variant №14

Calculate indefinite integrals. In tasks 1-6, you need to check the correctness of the integration operation using differentiation.

1. $\int \frac{dx}{(1+x^2)\sqrt[3]{4+\operatorname{arctg} x}}$
2. $\int \operatorname{ctg}^2 7x\, dx$
3. $\int \frac{1+\ln^{3/2}(x+7)}{x+7}\, dx$
4. $\int \frac{x^2\, dx}{\sqrt{4x^3+16}}$
5. $\int \frac{\sin 4x}{\sqrt{\cos^2 4x-1}}\, dx$
6. $\int \frac{6x-1}{e^{3x^2-x}}\, dx$
7. $\int \frac{dx}{2x+10+x^2}$
8. $\int \frac{dx}{\sqrt{x^2-2x+5}}$
9. $\int \frac{(3-2x)\, dx}{3x^2+2x-5}$
10. $\int \frac{x-4}{\sqrt{x-x^2+2}}\, dx$
11. $\int \sqrt{x^2+12x+11}\, dx$
12. $\int \sqrt{-x^2+6x}\, dx$
13. $\int \frac{x^2\, dx}{\sqrt{x^2-2x+10}}$
14. $\int \frac{\sqrt{x}}{1+\sqrt[4]{x}}\, dx$
15. $\int \frac{\sqrt[4]{(x+3)^3}-8}{\sqrt{x+3}-4}\, dx$
16. $\int (8x-2)\cos 4x\, dx$
17. $\int \operatorname{arctg}\sqrt{6x-1}\, dx$
18. $\int \ln^2(x+9)\, dx$
19. $\int (x^2-4)e^{4x}\, dx$
20. $\int \frac{x\cdot\sin x}{\cos^5 x}\, dx$
21. $\int \frac{dx}{(3x+1)(x^2-2x-15)}$
22. $\int \frac{(x^2+7x-15)\, dx}{(x+2)(x^2-2x+17)}$
23. $\int \frac{x^2+2x+2}{x^3+4x^2+4x}\, dx$
24. $\int \frac{3x^2+2x+5}{(x-2)^2(x^2+3)}\, dx$
25. $\int \frac{3x^3+2x^2-x}{x^2+3x+2}\, dx$
26. $\int \frac{dx}{(x^2+2x+5)^2}$
27. $\int \sin 3x\cos 7x\, dx$
28. $\int \sin^2 \frac{7}{2}x\, dx$
29. $\int \cos^3 5x\, dx$
30. $\int \sin^4 \frac{4}{3}x\, dx$
31. $\int \sin^2 x\cos^5 x\, dx$
32. $\int \frac{dx}{5\sin x-7\cos x}$
33. $\int \frac{dx}{4+3\operatorname{tg} x}$
34. $\int \frac{\sqrt{x^2-16}}{x}\, dx$
35. $\int \frac{dx}{x\sqrt{1-x-x^2}}$
36. $\int \frac{\sqrt[5]{(1+\sqrt{x})^4}}{x\sqrt[10]{x^9}}\, dx$

Indefinite integral

Variant №15

Calculate indefinite integrals. In tasks 1-6, you need to check the correctness of the integration operation using differentiation.

1. $\int \frac{dx}{\sin^2 3x\,(3+\operatorname{ctg} 3x)^3}$

2. $\int \frac{x^3+4x}{\sqrt{x^4+16}}\,dx$

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

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

5. $\int \frac{-7x^2}{x^6+49}\,dx$

6. $\int \operatorname{tg}^4 \frac{x}{4}\,dx$

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

8. $\int \frac{dx}{\sqrt{8-7x-x^2}}$

9. $\int \frac{(1-3x)\,dx}{7x^2+2x-5}$

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

11. $\int \sqrt{x^2+2x-8}\,dx$

12. $\int \sqrt{8-7x-x^2}\,dx$

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

14. $\int \frac{dx}{\sqrt{x}+\sqrt[4]{x}}$

15. $\int \frac{dx}{(x+1)(\sqrt{x+5}+2)}$

16. $\int (3x+1)\sin 3x\,dx$

17. $\int \frac{x\,dx}{\cos^2 x}$

18. $\int \operatorname{arctg} 2x\,dx$

19. $\int e^{\sqrt{x+5}}\,dx$

20. $\int x\ln(x^2+7)\,dx$

21. $\int \frac{(x^2+x+1)\,dx}{(x^2-9x+8)(x+2)}$

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

23. $\int \frac{(x+3)\,dx}{(x-1)(x^2+3x+12)}$

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

25. $\int \frac{18x^3-3x^2+x+9}{9x^2+3x+1}\,dx$

26. $\int \frac{(x-1)\,dx}{(x^2+5x-6)^2}$

27. $\int \cos 2x \sin 5x\,dx$

28. $\int \sin^2 12x\,dx$

29. $\int \cos^3 \frac{3}{11}x\,dx$

30. $\int \sin^4 \frac{2}{3}x\,dx$

31. $\int \frac{\cos^3 x}{\sin^7 x}\,dx$

32. $\int \frac{dx}{5-\cos x+2\sin x}$

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

34. $\int \frac{\sqrt{x^2-7}}{x}\,dx$

35. $\int \frac{dx}{x\sqrt{x^2-2x+2}}$

36. $\int \frac{\sqrt[3]{(1+\sqrt[4]{x^3})^2}}{x^2\sqrt[4]{x}}\,dx$

Indefinite integral

Variant №16

Calculate indefinite integrals. In tasks 1-6, you need to check the correctness of the integration operation using differentiation.

1. $\int \frac{1+x-x^2}{\sqrt{(1-x^2)^3}}\,dx$
2. $\int \sec^2 2x\ (2+\operatorname{ctg}^2 2x)\,dx$
3. $\int \frac{\sqrt{1-4\ln x}}{x}\,dx$
4. $\int x\sin(x^2+1)\,dx$
5. $\int \frac{-3-2x}{(x^2+3x+2)^6}\,dx$
6. $\int \frac{\sin\frac{x}{4}}{\sqrt{1-4\cos^2\frac{x}{4}}}\,dx$
7. $\int \frac{dx}{15+2x-x^2}$
8. $\int \frac{dx}{\sqrt{5x^2-6x+1}}$
9. $\int \frac{3-x}{x^2+3x-4}\,dx$
10. $\int \frac{(x+4)\,dx}{\sqrt{3+2x-x^2}}$
11. $\int \sqrt{x^2+7x-8}\,dx$
12. $\int \sqrt{x-2x^2+3}\,dx$
13. $\int \frac{x^2\,dx}{\sqrt{x^2+5x+6}}$
14. $\int \frac{dx}{x+\sqrt[3]{x}}$
15. $\int \frac{\sqrt{2+x}}{\sqrt[3]{2+x}+1}\,dx$
16. $\int (1-6x)\mathrm{e}^{3x}\,dx$
17. $\int \operatorname{arctg}\sqrt{6x-1}\,dx$
18. $\int \arcsin\frac{x}{4}\,dx$
19. $\int x^2\sin^2 3x\,dx$
20. $\int \mathrm{e}^x\sin 2x\,dx$
21. $\int \frac{(x+3)\,dx}{(x+5)(x-1)(2x+1)}$
22. $\int \frac{2x+1}{x^2(x+4)^2}\,dx$
23. $\int \frac{(9x+8)\,dx}{(x-2)(x^2+2x+5)}$
24. $\int \frac{(x^2+x+8)\,dx}{(x-1)(x^2+2x+2)}$
25. $\int \frac{x^4+3x^2-x+1}{x^2-2x+9}\,dx$
26. $\int \frac{-x\,dx}{(x^2+3x+9)^2}$
27. $\int \cos\frac{x}{2}\cos 3x\,dx$
28. $\int \cos^2\frac{5}{11}x\,dx$
29. $\int \sin^3\frac{7}{8}x\,dx$
30. $\int \cos^4\frac{3}{4}x\,dx$
31. $\int \cos^5 x\sin^2 x\,dx$
32. $\int \frac{dx}{5+4\sin x}$
33. $\int \frac{dx}{1+\sin^2 x}$
34. $\int \frac{dx}{\sqrt{(16-x^2)^5}}$
35. $\int \frac{dx}{x\sqrt{10x^2-6x+1}}$
36. $\int \frac{\sqrt[3]{(1+\sqrt[4]{x})^2}}{x\sqrt[12]{x^5}}\,dx$

Indefinite integral

Variant №17

Calculate indefinite integrals. In tasks 1-6, you need to check the correctness of the integration operation using differentiation.

1. $\int \frac{\operatorname{tg} x + 4}{\sin^2 x + \cos 2x}\, dx$

2. $\int \frac{x\, dx}{\sqrt{16 - x^4}}$

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

4. $\int \frac{\operatorname{tg}\sqrt{x-7}}{\sqrt{x-7}}\, dx$

5. $\int \frac{x^4\, dx}{32x^5 + 9}$

6. $\int \frac{\cos\frac{x}{3} dx}{\sqrt{\sin\frac{x}{3} + 4}}$

7. $\int \frac{dx}{x^2 + 6x + 13}$

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

9. $\int \frac{(2x+5)\, dx}{3x^2 + 2x - 8}$

10. $\int \frac{x\, dx}{\sqrt{2 - x - x^2}}$

11. $\int \sqrt{6x - 4 + 4x^2}\, dx$

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

13. $\int \frac{x^2\, dx}{\sqrt{x^2 + 6x + 5}}$

14. $\int \frac{\sqrt{x}}{1 + \sqrt[4]{x}}\, dx$

15. $\int \frac{(\sqrt[3]{x+2} - 1)\, dx}{\sqrt{x+2} - \sqrt[3]{x+2}}$

16. $\int e^{-2x}(4x - 3)\, dx$

17. $\int x \ln(x^2 + 1)\, dx$

18. $\int \operatorname{arcctg}\frac{x}{4}\, dx$

19. $\int (x^2 + x)\cos x\, dx$

20. $\int e^{3x} \sin x\, dx$

21. $\int \frac{(x+1)\, dx}{(4x-1)(x^2-4)}$

22. $\int \frac{(x^2 - 1)\, dx}{x^3 - 6x^2 + 9x}$

23. $\int \frac{(13 + 11x - x^2)\, dx}{(x-3)(x^2 + 6x + 10)}$

24. $\int \frac{(2x^2 + 21)\, dx}{(x^2 + 4)(x + 3)}$

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

26. $\int \frac{(x-1)\, dx}{(x^2 + 4x + 20)^2}$

27. $\int \sin 3x \sin 2x\, dx$

28. $\int \cos^2 \frac{2}{9} x\, dx$

29. $\int \sin^3 \frac{x}{5}\, dx$

30. $\int \cos^4 4x\, dx$

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

32. $\int \frac{dx}{\sin x - 4\cos x}$

33. $\int \frac{dx}{3 - \cos^2 x}$

34. $\int x^2 \sqrt{9 - x^2}\, dx$

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

36. $\int \frac{\sqrt{1 + \sqrt[4]{x^3}}}{x^2 \sqrt[8]{x}}\, dx$

Indefinite integral

Variant №18

Calculate indefinite integrals. In tasks 1-6, you need to check the correctness of the integration operation using differentiation.

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

2. $\int \frac{\sin\frac{x}{5}}{\sqrt{5+\cos\frac{x}{5}}}\,dx$

3. $\int x\,(e^{x^2} + e^{-x^2})^2\,dx$

4. $\int \frac{x^3 + 4x}{x^4 + 36}\,dx$

5. $\int \frac{-x\,dx}{\sqrt{36 - x^4}}$

6. $\int \frac{dx}{x\sqrt{\ln^2 x - 25}}$

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

8. $\int \frac{dx}{\sqrt{x^2 + 6x}}$

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

10. $\int \frac{(x-3)\,dx}{\sqrt{x^2 + 6x}}$

11. $\int \sqrt{x^2 + 18x + 17}\,dx$

12. $\int \sqrt{x - x^2 + 6}\,dx$

13. $\int \frac{x^2\,dx}{\sqrt{x^2 + 2x + 5}}$

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

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

16. $\int (4 - 5x)e^{-5x}\,dx$

17. $\int \operatorname{arctg}\sqrt{x-1}\,dx$

18. $\int \arccos 4x\,dx$

19. $\int x^2 \cos 6x\,dx$

20. $\int \frac{\arcsin\frac{x}{2}}{\sqrt{2-x}}\,dx$

21. $\int \frac{(8x-2)\,dx}{(x+3)(x^2 - 4x + 5)}$

22. $\int \frac{(x^2 - x + 8)\,dx}{(x^2 + 4x - 21)(x+1)}$

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

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

25. $\int \frac{5x^3 - x^2 + 8}{x^2 + 3x + 12}\,dx$

26. $\int \frac{(x+9)\,dx}{(x^2 + 8x + 17)^2}$

27. $\int \cos 2x \cos 7x\,dx$

28. $\int \sin^2 4x\,dx$

29. $\int \cos^3\frac{3}{5}x\,dx$

30. $\int \sin^4 2x\,dx$

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

32. $\int \frac{dx}{5 + \sin x + 3\cos x}$

33. $\int \frac{dx}{8 - 6\sin^2 x + 5\cos^2 x}$

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

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

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

Indefinite integral

Variant №19

Calculate indefinite integrals. In tasks 1-6, you need to check the correctness of the integration operation using differentiation.

1. $\int (\cos(\ln x) + \ln^5 x + 4)\,\frac{dx}{x}$

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

3. $\int \frac{x^2}{x^6-81}\,dx$

4. $\int \sin 5x\, e^{\cos 5x}\,dx$

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

6. $\int (10x-7)(5x^2-7x+8)^3\,dx$

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

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

9. $\int \frac{3x+7}{x^2+2x+17}\,dx$

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

11. $\int \sqrt{x^2+3x-4}\,dx$

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

13. $\int \frac{x^2\,dx}{\sqrt{x^2+2x+5}}$

14. $\int \frac{2\sqrt{x+1}+8}{x+4\sqrt{x+1}+9}\,dx$

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

16. $\int e^{-3x}(1-3x)\,dx$

17. $\int \ln(x^2+25)\,dx$

18. $\int (x-5)\sin\frac{x}{2}\,dx$

19. $\int x^2 \operatorname{arctg} x\,dx$

20. $\int \frac{x\cos x\,dx}{\sin^3 x}$

21. $\int \frac{(6x^2+3x-15)\,dx}{(x^2+4x+3)(x-2)}$

22. $\int \frac{(5x+3)\,dx}{(2-x)(x^2+2x+5)}$

23. $\int \frac{-x^2+3x+19}{(x-2)(x+3)^2}\,dx$

24. $\int \frac{(x^2-24)\,dx}{(x+2)(x^2+16)}$

25. $\int \frac{x^2+x\ +5}{x^2+5x+12}\,dx$

26. $\int \frac{(x+1)\,dx}{(x^2-4x+40)^2}$

27. $\int \cos 3x \sin 5x\,dx$

28. $\int \sin^2 \frac{4}{3}x\,dx$

29. $\int \cos^3 \frac{7}{2}x\,dx$

30. $\int \sin^4 x\,dx$

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

32. $\int \frac{dx}{8-4\sin x+9\cos x}$

33. $\int \frac{dx}{\sin^2 x + \operatorname{tg}^2 x}$

34. $\int \frac{dx}{(x-1)\sqrt{x^2+x+1}}$

35. $\int \frac{dx}{x\sqrt{x^2-16}}$

36. $\int \frac{\sqrt[3]{1+\sqrt[3]{x}}}{x\sqrt[9]{x^4}}\,dx$

Indefinite integral

Variant №20

Calculate indefinite integrals. In tasks 1-6, you need to check the correctness of the integration operation using differentiation.

1. $\int \frac{dx}{(1+x^2)\sqrt{25+\operatorname{arctg}^2 x}}$

2. $\int \frac{\sqrt{9-\ln x}}{x}\,dx$

3. $\int \frac{x^2\,dx}{25+x^6}$

4. $\int \frac{\cos^3 x+\sin x}{\cos^2 x}\,dx$

5. $\int (2x+1)\mathrm{e}^{-x^2-x+8}\,dx$

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

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

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

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

10. $\int \frac{x+5}{\sqrt{3x^2+6x-1}}\,dx$

11. $\int \sqrt{x^2+2x-15}\,dx$

12. $\int \sqrt{-x^2-3x+4}\,dx$

13. $\int \frac{x^2\,dx}{\sqrt{x^2+2x+2}}$

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

15. $\int \frac{\sqrt{x+1}}{\sqrt[3]{x+1}-1}\,dx$

16. $\int (4x+1)\mathrm{e}^{4x}\,dx$

17. $\int \operatorname{arctg}\sqrt{5x-1}\,dx$

18. $\int (x+5)\ln(x+1)\,dx$

19. $\int \frac{x\cos x}{\sin^3 x}\,dx$

20. $\int (x^2+2x)\cos x\,dx$

21. $\int \frac{x^2-2x-6}{(x^2-4)(x+1)}\,dx$

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

23. $\int \frac{2x^2-3x-3}{(x-1)(x^2-2x+5)}\,dx$

24. $\int \frac{2x^2+1}{(x-2)(x^2+5)}\,dx$

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

26. $\int \frac{x+2}{(x^2-4x-12)^3}\,dx$

27. $\int \sin 3x\cos 6x\,dx$

28. $\int \sin^2\frac{x}{8}\,dx$

29. $\int \cos^3\frac{x}{3}\,dx$

30. $\int \sin^4 5x\,dx$

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

32. $\int \frac{dx}{8-4\sin x+7\cos x}$

33. $\int \frac{dx}{2+3\cos^2 x}$

34. $\int \frac{x^2}{\sqrt{(1+x^2)^5}}\,dx$

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

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

Indefinite integral

Variant №21

Calculate indefinite integrals. In tasks 1-6, you need to check the correctness of the integration operation using differentiation.

1. $\int \frac{\operatorname{arctg} x + x^2}{1+x^2}\,dx$
2. $\int \frac{7+\sin 2x}{\sin^2 x}\,dx$
3. $\int \frac{x\,dx}{64+x^4}$
4. $\int (x+3)\,e^{x^2+6x+2}\,dx$
5. $\int \frac{x\,dx}{49-9x^4}$
6. $\int \frac{(-9+6x)\,dx}{\sqrt{3x^2-9x+1}}$
7. $\int \frac{dx}{12+4x-x^2}$
8. $\int \frac{dx}{\sqrt{x^2-x-2}}$
9. $\int \frac{2-x}{2x^2+x-1}\,dx$
10. $\int \frac{x\,dx}{\sqrt{x^2+6x+10}}$
11. $\int \sqrt{4x^2+4x+10}\,dx$
12. $\int \sqrt{8-7x-x^2}\,dx$
13. $\int \frac{x^2\,dx}{\sqrt{x^2+3x-4}}$
14. $\int \frac{1+x}{1+\sqrt{x}}dx$
15. $\int \frac{\sqrt{x-1}\,dx}{x-1+\sqrt[3]{(x-1)^2}}$
16. $\int e^{-6x}(1-36x)\,dx$
17. $\int x \operatorname{arctg}\sqrt{x^2-1}\,dx$
18. $\int \arcsin x\,dx$
19. $\int (x^2+1)\sin x\,dx$
20. $\int \frac{\ln(x-1)}{(x+1)^3}\,dx$
21. $\int \frac{(x+5)\,dx}{(x+1)(x^2-x-12)}$
22. $\int \frac{x^2+x-1}{x^3+x^2}\,dx$
23. $\int \frac{(3x^2-1)\,dx}{(x-1)(x^2+1)}$
24. $\int \frac{(x^2-5x-14)\,dx}{(x-1)(x^2+4x+13)}$
25. $\int \frac{3x^3-2x+5}{x^2+4x+14}\,dx$
26. $\int \frac{(1-x)\,dx}{(x^2+5x+4)^2}$
27. $\int \sin 4x \cdot \sin 7x\,dx$
28. $\int \cos^2 \frac{x}{9}\,dx$
29. $\int \sin^3 8x\,dx$
30. $\int \cos^4 \frac{5}{4}x\,dx$
31. $\int \cos^5 x \sin^3 x\,dx$
32. $\int \frac{dx}{\cos x + 2\sin x + 3}$
33. $\int \frac{\sin^2 x}{1+\cos^2 x}\,dx$
34. $\int \frac{x^4\,dx}{\sqrt{36-x^2}}$
35. $\int \frac{dx}{(x-1)\sqrt{x^2-2x}}$
36. $\int \frac{\sqrt[3]{1+\sqrt[3]{x^2}}}{x\sqrt[9]{x^8}}\,dx$

Indefinite integral

Variant №22

Calculate indefinite integrals. In tasks 1-6, you need to check the correctness of the integration operation using differentiation.

1. $\int \frac{4x^4 + (5\ln x + 1)^5}{x}\,dx$
2. $\int \sqrt[5]{1-13x}\,dx$
3. $\int \frac{\cos 4x\,dx}{\sin^9 4x}$
4. $\int \frac{dx}{e^x\,(81 + e^{-2x})}$
5. $\int \frac{-3x\,dx}{\sqrt{47x^4 + 64}}$
6. $\int \frac{2-x}{2x^2 + x + 1}\,dx$
7. $\int \frac{dx}{\sqrt{x^2 + 3x - 4}}$
8. $\int \frac{dx}{2 + x - x^2}$
9. $\int \frac{3x+4}{\sqrt{x^2 + 2x - 3}}\,dx$
10. $\int \frac{3-2x}{5x^2 + 2x + 1}\,dx$
11. $\int \sqrt{x^2 - 6x + 5}\,dx$
12. $\int \sqrt{5 - 4x - x^2}\,dx$
13. $\int \frac{x^2\,dx}{\sqrt{x^2 + 5x + 4}}$
14. $\int \frac{x+11}{\sqrt[3]{x+3} + 2}\,dx$
15. $\int \frac{dx}{(\sqrt{x+1} - \sqrt[3]{x+1})\sqrt[6]{x+1}}$
16. $\int e^{-2x}(1-4x)\,dx$
17. $\int (\sqrt{x} + 1)\ln x\,dx$
18. $\int (x+4)\sin^2 \frac{x}{2}\,dx$
19. $\int (x^2 + 1)\operatorname{arctg} x\,dx$
20. $\int \frac{\arcsin 2x}{\sqrt{1+2x}}\,dx$
21. $\int \frac{x^2 + x - 1}{x^3 + x^2 - 12x}\,dx$
22. $\int \frac{x+8}{x(x-2)^2}\,dx$
23. $\int \frac{(1-3x)\,dx}{(x^2+4)(x-2)^2}$
24. $\int \frac{(x^2 + 7x + 8)\,dx}{(x-2)(x^2 + 2x + 5)}$
25. $\int \frac{5x^3 + x^2 + 4}{x^2 + 3x + 9}\,dx$
26. $\int \frac{2x\,dx}{(x^2 + 4x + 53)^2}$
27. $\int \cos 2x \cos 8x\,dx$
28. $\int \sin^2 \frac{5}{2}x\,dx$
29. $\int \cos^3 \frac{6}{7}x\,dx$
30. $\int \sin^4 3x\,dx$
31. $\int \sin^5 x \cos^3 x\,dx$
32. $\int \frac{dx}{4\cos x + 3\sin x}$
33. $\int \frac{dx}{3 - 2\cos^2 x}$
34. $\int \frac{x^2\,dx}{\sqrt{(25 - x^2)^3}}$
35. $\int \frac{dx}{x\sqrt{x^2 - 2x + 5}}$
36. $\int \frac{\sqrt{1 + \sqrt[3]{x^2}}}{x^2}\,dx$

Indefinite integral

Variant №23

Calculate indefinite integrals. In tasks 1-6, you need to check the correctness of the integration operation using differentiation.

1. $\int (\sin(\ln x) + \ln^9 x + 9)\,\frac{dx}{x}$

2. $\int \frac{13-5x}{x^2+9}\,dx$

3. $\int \frac{\operatorname{cosec}^2 5x}{36-\operatorname{ctg} 5x}\,dx$

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

5. $\int \frac{x\,dx}{\sqrt{9x^4-49}}$

6. $\int \frac{(1+x)\,dx}{\sqrt[5]{(3x^2+6x-5)^2}}$

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

8. $\int \frac{dx}{17-2x+x^2}$

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

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

11. $\int \sqrt{9x^2+6x+10}\,dx$

12. $\int \sqrt{6-5x-x^2}\,dx$

13. $\int \frac{x^2\,dx}{\sqrt{x^2-x-6}}$

14. $\int \frac{dx}{(x+1)(\sqrt{x+5}+2)}$

15. $\int \frac{\sqrt[4]{x}}{1+\sqrt{x}}\,dx$

16. $\int (8-3x)\cos 5x\,dx$

17. $\int \ln(x+13)\,dx$

18. $\int x \operatorname{arctg} x\,dx$

19. $\int \arccos x\,dx$

20. $\int (x^2+2x+2)\,e^{-2x}\,dx$

21. $\int \frac{x+16}{x^3-16x}\,dx$

22. $\int \frac{(x+3)\,dx}{(x+1)(x^2+4x+4)}$

23. $\int \frac{25\,dx}{(x-3)^2(x^2+3x+7)}$

24. $\int \frac{(3x^2+x+15)dx}{(x+2)(x^2-2x+17)}$

25. $\int \frac{x^3+4x^2+5x+3}{x^2+7x+13}\,dx$

26. $\int \frac{(3-2x)\,dx}{(x^2+3x+2)^2}$

27. $\int \sin\frac{10}{3}x \sin\frac{2}{3}x\,dx$

28. $\int \sin^2 5x\,dx$

29. $\int \cos^3\frac{2}{3}x\,dx$

30. $\int \sin^4 8x\,dx$

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

32. $\int \frac{\sin x}{1+\sin x}\,dx$

33. $\int \frac{dx}{1+\operatorname{tg} x}$

34. $\int \frac{\sqrt{x^2-49}}{x}\,dx$

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

36. $\int \frac{\sqrt[4]{(1+\sqrt{x})^3}}{x\sqrt[8]{x^7}}\,dx$

Indefinite integral

Variant №24

Calculate indefinite integrals. In tasks 1-6, you need to check the correctness of the integration operation using differentiation.

1. $\int \frac{e^{3x}+8}{e^{x}+2}\,dx$

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

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

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

5. $\int \frac{(x^3-1)\,dx}{x^4-4x+4}$

6. $\int \operatorname{tg}^4 5x \frac{dx}{\sin^2 5x}$

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

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

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

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

11. $\int \sqrt{x^2+9x+18}\,dx$

12. $\int \sqrt{x-x^2}\,dx$

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

14. $\int \frac{4-\sqrt[3]{x}}{\sqrt{x}-4}\,dx$

15. $\int \frac{3dx}{1+\sqrt[3]{x+1}}$

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

17. $\int \arcsin(x-1)\,dx$

18. $\int x \ln \frac{1-x}{1+x}\,dx$

19. $\int \operatorname{arctg}\sqrt{3x-1}\,dx$

20. $\int (x^2+4)e^{-x+1}\,dx$

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

22. $\int \frac{(x+4)\,dx}{(x+5)(x^2+2x+1)}$

23. $\int \frac{dx}{(x+8)(x^2+1)}$

24. $\int \frac{(x^2+3x-6)\,dx}{(x+1)(x^2-2x+5)}$

25. $\int \frac{x^3+2x^2+x-1}{x^2+6x+11}\,dx$

26. $\int \frac{(2-x)\,dx}{(x^2+x-2)^2}$

27. $\int \cos\frac{1}{2}x \cos 3x\,dx$

28. $\int \sin^2 3x\,dx$

29. $\int \cos^3 \frac{2}{9}x\,dx$

30. $\int \sin^4 \frac{5}{7}x\,dx$

31. $\int \frac{dx}{\operatorname{ctg}^4 x}$

32. $\int \frac{dx}{2\sin x+3\cos x-5}$

33. $\int \frac{dx}{5\sin^2 x-\cos^2 x}$

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

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

36. $\int \frac{\sqrt[5]{1+\sqrt[3]{x}}}{x\sqrt[5]{x^2}}\,dx$

Indefinite integral

Variant №25

Calculate indefinite integrals. In tasks 1-6, you need to check the correctness of the integration operation using differentiation.

1. $\int \frac{\operatorname{arctg} x + 4x}{1+x^2}\,dx$

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

3. $\int \frac{x^3 dx}{x^8 + 25}$

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

5. $\int \frac{dx}{\cos^6 x}$

6. $\int \frac{(7+2x)}{(x^2+7x-1)^8}\,dx$

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

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

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

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

11. $\int \sqrt{x^2-3x}\,dx$

12. $\int \sqrt{2x-17-x^2}\,dx$

13. $\int \frac{x^2\,dx}{\sqrt{2x^2+4x+11}}$

14. $\int \frac{\ln x\,dx}{x\sqrt{9+\ln x}}$

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

16. $\int (3-5x)\cos 2x\,dx$

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

18. $\int \frac{\ln(x+2)}{\sqrt{x+1}}\,dx$

19. $\int \frac{\arcsin x}{x^2}\,dx$

20. $\int x \operatorname{arcctg} x\,dx$

21. $\int \frac{(x+5)\,dx}{(x+1)(x^2+4x)}$

22. $\int \frac{dx}{(x^2-6x+9)(x+3)}$

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

24. $\int \frac{(x^2-7x-8)\,dx}{(x-2)(x^2+2x+10)}$

25. $\int \frac{x^3+2x^2+x-1}{x^2+4x+10}\,dx$

26. $\int \frac{(x-2)\,dx}{(x^2+3x-4)^2}$

27. $\int \cos 3x \sin 5x\,dx$

28. $\int \cos^2 \frac{2}{5} x\,dx$

29. $\int \sin^3 4x\,dx$

30. $\int \cos^4 2x\,dx$

31. $\int \frac{\sin^5 x}{\cos^2 x}\,dx$

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

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

34. $\int \frac{x^2\,dx}{\sqrt{(16-x^2)^3}}$

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

36. $\int \frac{\sqrt[5]{(1+\sqrt[3]{x^2})^4}}{x^2\sqrt[5]{x}}\,dx$

Indefinite integral

Variant №26

Calculate indefinite integrals. In tasks 1-6, you need to check the correctness of the integration operation using differentiation.

1. $\int \frac{(25-2x^2)}{x^2(25-x^2)}\,dx$

2. $\int \frac{5-\operatorname{ctg}^4 x}{\cos^2 x}\,dx$

3. $\int 9^x\left(1+\frac{9^{-x}}{\sqrt{x^5}}\right)dx$

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

5. $\int \frac{7x^6+9x^2+8}{(x^7+3x^3+8x)^7}\,dx$

6. $\int \frac{15x\,dx}{\sqrt{25-x^4}}$

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

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

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

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

11. $\int \sqrt{x^2+8x+15}\,dx$

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

13. $\int \frac{x^2\,dx}{\sqrt{x^2+7x+12}}$

14. $\int \frac{x+1+\sqrt{x+2}}{x+3}\,dx$

15. $\int \frac{1+\sqrt[4]{x}}{x+\sqrt{x}}\,dx$

16. $\int (3-9x)\sin 3x\,dx$

17. $\int \operatorname{arctg}\sqrt{5x-1}\,dx$

18. $\int (x^2+4)\mathrm{e}^{-4x}\,dx$

19. $\int x^2\ln(x-1)\,dx$

20. $\int \frac{x\arcsin x}{\sqrt{(1-x^2)^3}}\,dx$

21. $\int \frac{(x+6)\,dx}{x(x^2+5x+6)}$

22. $\int \frac{(11x+16)\,dx}{(x-1)(x+2)^2}$

23. $\int \frac{(9x+8)\,dx}{(x-2)(x^2+2x+5)}$

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

25. $\int \frac{x^4-x^2+5}{x^2+3x+8}\,dx$

26. $\int \frac{(x+1)\,dx}{(x^2+4x+5)^2}$

27. $\int \sin 7x\sin 5x\,dx$

28. $\int \cos^2 12x\,dx$

29. $\int \sin^3 7x\,dx$

30. $\int \cos^4 \frac{4}{11}x\,dx$

31. $\int \frac{\sin^3 x}{\cos^5 x}\,dx$

32. $\int \frac{dx}{3\cos x+2}$

33. $\int \frac{dx}{4+3\operatorname{tg} x}$

34. $\int x^3\sqrt{25-x^2}\,dx$

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

36. $\int \frac{\sqrt[4]{(1+\sqrt[3]{x^2})^3}}{x^2\sqrt[6]{x}}\,dx$

Indefinite integral

Variant №27

Calculate indefinite integrals. In tasks 1-6, you need to check the correctness of the integration operation using differentiation.

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

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

3. $\int \frac{dx}{x\sqrt{64-\ln^2 x}}$

4. $\int \frac{x^2\,dx}{\sqrt{x^3+81}}$

5. $\int \frac{dx}{\cos^4 2x}$

6. $\int \frac{1-10x+3x^2}{\sqrt{x^3-5x^2+x-1}}\,dx$

7. $\int \frac{dx}{\sqrt{2-6x+9x^2}}$

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

9. $\int \frac{(3-x)\,dx}{\sqrt{10-x^2+3x}}$

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

11. $\int \sqrt{5+4x^2-4x}\,dx$

12. $\int \sqrt{x-4x^2}\,dx$

13. $\int \frac{x^2\,dx}{\sqrt{x^2+5x+4}}$

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

15. $\int \frac{\sqrt{1+x}}{27+\sqrt[4]{(1+x)^3}}\,dx$

16. $\int (x+3)e^{-5x}\,dx$

17. $\int x\,\mathrm{arctg}\,x\,dx$

18. $\int (\arcsin x)^2\,dx$

19. $\int (x^2+x+1)\cos 2x\,dx$

20. $\int (5-4x-3x^2)\ln x\,dx$

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

22. $\int \frac{x^2\,dx}{(x+2)(x-4)^2}$

23. $\int \frac{(x+8)\,dx}{(x-1)(x^2-2x+10)}$

24. $\int \frac{dx}{(2x+1)(x^2+4)}$

25. $\int \frac{x^3-3x^2+x+1}{x^2+5x+9}\,dx$

26. $\int \frac{(1-x)\,dx}{(x^2+2x+5)^2}$

27. $\int \cos 6x\cos 4x\,dx$

28. $\int \sin^2 3x\,dx$

29. $\int \cos^3 \frac{2}{5}x\,dx$

30. $\int \sin^4 \frac{2}{7}x\,dx$

31. $\int \frac{\sin^3 x}{\cos^2 x+1}\,dx$

32. $\int \frac{dx}{2\sin x-\cos x+9}$

33. $\int \mathrm{ctg}^3 x\,dx$

34. $\int \frac{x^3\,dx}{\sqrt{81-x^2}}$

35. $\int \frac{dx}{x\sqrt{x^2-2x+2}}$

36. $\int \frac{\sqrt{1+\sqrt[5]{x^4}}}{x^2\sqrt[5]{x}}\,dx$

Indefinite integral

Variant №28

Calculate indefinite integrals. In tasks 1-6, you need to check the correctness of the integration operation using differentiation.

1. $\int \frac{\sqrt{\operatorname{arctg} 3x}}{1+9x^2}\,dx$
2. $\int x^2 \sqrt[7]{x^3-81}\,dx$
3. $\int \frac{\operatorname{tg}(\ln x)+\sqrt{x}}{x}\,dx$
4. $\int (\sin^2 5x+\cos^2 5x)\,dx$
5. $\int \frac{x-3}{x^2-6x+16}\,dx$
6. $\int \frac{x\,dx}{\sqrt{x^4+25}}$
7. $\int \frac{dx}{x^2+2x+2}$
8. $\int \frac{dx}{\sqrt{3+4x-4x^2}}$
9. $\int \frac{x+3}{5x^2+x-4}\,dx$
10. $\int \frac{(2x+3)\,dx}{\sqrt{6x-10-x^2}}$
11. $\int \sqrt{x^2-3x}\,dx$
12. $\int \sqrt{2-x-4x^2}\,dx$
13. $\int \frac{x^2\,dx}{\sqrt{x^2+3x-4}}$
14. $\int \frac{\ln x\,dx}{x\sqrt{1+\ln x}}$
15. $\int \frac{\sqrt{x}}{\sqrt[4]{x^3}+1}\,dx$
16. $\int (4-8x)\mathrm{e}^{-2x}\,dx$
17. $\int \operatorname{arctg} 3x\,dx$
18. $\int x^2 \ln(x+8)\,dx$
19. $\int \frac{x\cos x\sin x}{\cos^3 2x}\,dx$
20. $\int \frac{\ln(\cos x)}{\cos^2 x}\,dx$
21. $\int \frac{(x^2-x+2)\,dx}{x^3-5x^2+4x}$
22. $\int \frac{2x^2-5x+1}{x^3-2x^2+x}\,dx$
23. $\int \frac{(2x-3)\,dx}{(x+1)(x^3+4x)}$
24. $\int \frac{(5x+26)\,dx}{(2-x)(x^2+2x+10)}$
25. $\int \frac{4x^3+x^2-x+2}{x^2-5x+7}\,dx$
26. $\int \frac{(x+7)\,dx}{(x^2-2x+10)^2}$
27. $\int \cos 7x\cos 4x\,dx$
28. $\int \cos^2 5x\,dx$
29. $\int \sin^3 \frac{2}{3}x\,dx$
30. $\int \cos^4 \frac{3}{4}x\,dx$
31. $\int \frac{\sin^3 5x}{\cos^2 5x}\,dx$
32. $\int \frac{dx}{3-2\sin x+\cos x}$
33. $\int \frac{dx}{64+\operatorname{tg} x}$
34. $\int \frac{dx}{\sqrt{(25-x^2)^3}}$
35. $\int \frac{dx}{x\sqrt{2x^2-5x+3}}$
36. $\int \frac{\sqrt[3]{1+\sqrt[5]{x^4}}}{x^2\sqrt[15]{x}}\,dx$

Indefinite integral

Variant №29

Calculate indefinite integrals. In tasks 1-6, you need to check the correctness of the integration operation using differentiation.

1. $\int (\ln(x^2+4)+4)\frac{x}{x^2+4}dx$
2. $\int \frac{4dx}{e^x\sqrt{16-e^{-2x}}}$
3. $\int \frac{(4-\operatorname{tg}4x)^5\,dx}{\cos^2 4x}$
4. $\int \cos\frac{x}{4}\,8^{\sin\frac{x}{4}}\,dx$
5. $\int \frac{(x^2+2x-1)\,dx}{x^3+3x^2-3x+9}$
6. $\int \operatorname{tg}^2 x\,dx$
7. $\int \frac{dx}{\sqrt{8+2x-x^2}}$
8. $\int \frac{dx}{x^2+7x-8}$
9. $\int \frac{(8x-11)\,dx}{\sqrt{3+2x-x^2}}$
10. $\int \frac{3-4x}{3x^2+3x+7}dx$
11. $\int \sqrt{5x+x^2}\,dx$
12. $\int \sqrt{8+2x-x^2}\,dx$
13. $\int \frac{x^2\,dx}{\sqrt{x^2-2x-15}}$
14. $\int \frac{x+2}{\sqrt{x+1}+1}dx$
15. $\int \frac{dx}{\sqrt{x}+\sqrt[3]{x}+\sqrt[6]{x}}$
16. $\int e^{3x}(1+9x)\,dx$
17. $\int x^3\sin x^2\,dx$
18. $\int (x-2)\arcsin x\,dx$
19. $\int \ln(x+\sqrt{1+x^2})\,dx$
20. $\int \frac{x\operatorname{arctg}x}{\sqrt{1+x^2}}dx$
21. $\int \frac{dx}{25x^3-x}$
22. $\int \frac{(8x^2-4)\,dx}{(x-1)^2(x+1)}$
23. $\int \frac{(7x-36)\,dx}{(x+2)(x^2-2x+17)}$
24. $\int \frac{dx}{x^2(x^2-3x+15)}$
25. $\int \frac{x^3+x^2-3x}{x^2+2x+3}dx$
26. $\int \frac{dx}{(x^2+16)^3}$
27. $\int \cos\frac{7x}{4}\sin\frac{5x}{4}\,dx$
28. $\int \cos^2 5x\,dx$
29. $\int \sin^3\frac{4}{9}x\,dx$
30. $\int \cos^4 3x\,dx$
31. $\int \cos^2 x\sin^3 x\,dx$
32. $\int \frac{dx}{3\sin x-2\cos x-5}$
33. $\int \frac{dx}{4+\operatorname{tg}^2 x}$
34. $\int \frac{x^2\,dx}{\sqrt{81-x^2}}$
35. $\int \frac{dx}{(x+2)^2\sqrt{x^2+5}}$
36. $\int \frac{\sqrt[4]{1+\sqrt[3]{x}}}{x\sqrt[12]{x^5}}dx$

Indefinite integral

Variant №30

Calculate indefinite integrals. In tasks 1-6, you need to check the correctness of the integration operation using differentiation.

1. $\int \frac{x^4 dx}{\sin^2(5+2x^5)}$

2. $\int \frac{e^{\operatorname{arctg}\frac{x}{5}}+10}{25+x^2}\,dx$

3. $\int \frac{8^{2x}}{\sqrt{9-8^{4x}}}\,dx$

4. $\int \frac{dx}{x\sqrt[5]{13+\ln x}}$

5. $\int \frac{dx}{(3x+15)^5}$

6. $\int \frac{(-1-7x)\,dx}{\sqrt{7x^2+2x+7}}$

7. $\int \frac{dx}{12-x-x^2}$

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

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

10. $\int \frac{x-2}{\sqrt{6-x-x^2}}\,dx$

11. $\int \sqrt{x^2+2x+17}\,dx$

12. $\int \sqrt{4+3x-x^2}\,dx$

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

14. $\int \frac{\sqrt{x}}{\sqrt{x}-\sqrt[3]{x}}\,dx$

15. $\int \frac{\sqrt{x+1}}{\sqrt[3]{x+1}-1}\,dx$

16. $\int (x^2+\sqrt{x}+1)\ln x\,dx$

17. $\int (x^2+4)\sin 3x\,dx$

18. $\int \operatorname{arctg}\sqrt{x}\,dx$

19. $\int \arcsin x\,dx$

20. $\int \frac{x\cos x}{\sin^3 x}\,dx$

21. $\int \frac{2x^2+4}{x(x-1)(x+3)}\,dx$

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

23. $\int \frac{x+1}{x^2(x^2+16)}\,dx$

24. $\int \frac{(9x-4)\,dx}{(x+1)(4x^2-4x+5)}$

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

26. $\int \frac{dx}{(x^2-2x-3)^2}$

27. $\int \sin 2x\cos 5x\,dx$

28. $\int \sin^2 4x\,dx$

29. $\int \cos^3\frac{3}{5}x\,dx$

30. $\int \sin^4 6x\,dx$

31. $\int \frac{\sin^3 x}{\sqrt{\cos x}}\,dx$

32. $\int \frac{3+\cos x}{2-\sin x}\,dx$

33. $\int \frac{dx}{4\sin^2 x+5\cos^2 x}$

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

35. $\int \frac{dx}{x\sqrt{x^2+8x+1}}$

36. $\int \frac{\sqrt[5]{1+\sqrt[5]{x^4}}}{x^2\sqrt[25]{x^{11}}}\,dx$

Indefinite integral

Variant №31

Calculate indefinite integrals. In tasks 1-6, you need to check the correctness of the integration operation using differentiation.

1. $\int \frac{dx}{\sqrt{1+2x}\cos^2(4\sqrt{1+2x})}$
2. $\int x^3\cos(7-7x^4)\,dx$
3. $\int \frac{5^{\arcsin x}+5}{\sqrt{1-x^2}}\,dx$
4. $\int \frac{e^x}{e^{2x}+36}\,dx$
5. $\int \frac{dx}{\cos^4 x}$
6. $\int \frac{-8x}{\sqrt{64-x^4}}\,dx$
7. $\int \frac{dx}{\sqrt{3-2x-x^2}}$
8. $\int \frac{dx}{3x^2-5x+2}$
9. $\int \frac{x-3}{\sqrt{3-2x-x^2}}\,dx$
10. $\int \frac{(2x-3)\,dx}{7x^2+2x-5}$
11. $\int \sqrt{x^2+4x}\,dx$
12. $\int \sqrt{5-4x-x^2}\,dx$
13. $\int \frac{x^2\,dx}{\sqrt{x^2+2x+17}}$
14. $\int \frac{(x+2)\,dx}{\sqrt{x+1}+1}$
15. $\int \frac{x+\sqrt[3]{x^2}+\sqrt[6]{x}}{x(1+\sqrt[3]{x})}\,dx$
16. $\int x^2\ln(1+x)\,dx$
17. $\int \frac{\arcsin\sqrt{x}}{\sqrt{1-x}}\,dx$
18. $\int (x^2+2)e^{-x}\,dx$
19. $\int x\,\mathrm{arctg}\sqrt{x^2-1}\,dx$
20. $\int (x+2)\cos^2 x\,dx$
21. $\int \frac{x^2-4x-4}{x^3-4x}\,dx$
22. $\int \frac{x+3}{x^2(x-7)}\,dx$
23. $\int \frac{dx}{(x+3)(x^2-4x+5)}$
24. $\int \frac{(x^2-3x+40)\,dx}{(x+2)(x^2-2x+17)}$
25. $\int \frac{3x^2\,dx}{x^2+x+9}$
26. $\int \frac{dx}{(x^2+1)^2(x+2)}$
27. $\int \cos 4x\cos 8x\,dx$
28. $\int \sin^2\frac{x}{8}\,dx$
29. $\int \cos^3 7\,dx$
30. $\int \sin^4\frac{3}{11}x\,dx$
31. $\int \sin^5 x\cos^2 x\,dx$
32. $\int \frac{dx}{4+\cos x+\sin x}$
33. $\int \frac{dx}{1+3\sin^2 x}$
34. $\int \frac{dx}{\sqrt{(4-x^2)^3}}$
35. $\int \frac{dx}{x\sqrt{3x^2-2x-1}}$
36. $\int \frac{\sqrt[4]{(1+\sqrt[5]{x^4})^3}}{x^2\sqrt[5]{x^2}}\,dx$

TABLE OF INDEFINITE INTEGRALS

	Power functions		Exponential functions
1.	$\int u^{\alpha} du = \frac{u^{\alpha+1}}{\alpha+1} + C,\ \alpha \neq -1,$	3.	$\int \mathrm{e}^{u}\, du = \mathrm{e}^{u} + C,$
2.	$\int \frac{du}{u} = \ln\lvert u \rvert + C,$	4.	$\int a^{u} du = \frac{a^{u}}{\ln a} + C, \quad a > 0, \quad a \neq 1,$
	Trigonometric functions		**Hyperbolic functions**
5.	$\int \sin u du = -\cos u + C,$	13.	$\int \mathrm{sh}\, u\, du = \mathrm{ch}\, u + C,$
6.	$\int \cos u du = \sin u + C,$	14.	$\int \mathrm{ch}\, u\, du = \mathrm{sh}\, u + C,$
7.	$\int \frac{du}{\cos^2 u} = \mathrm{tg}\, u + C,$	15.	$\int \frac{du}{\mathrm{ch}^2 u} = \mathrm{th}\, u + C,$
8.	$\int \frac{du}{\sin^2 u} = -\mathrm{ctg}\, u + C,$	16.	$\int \frac{du}{\mathrm{sh}^2 u} = -\mathrm{cth}\, u + C,$
9.	$\int \mathrm{tg}\, u du = -\ln\lvert\cos u\rvert + C,$	17.	$\int \mathrm{th}\, u du = \ln\lvert\mathrm{ch}\, u\rvert + C,$
10.	$\int \mathrm{ctg}\, u du = \ln\lvert\sin u\rvert + C,$	18.	$\int \mathrm{cth}\, u du = \ln\lvert\mathrm{sh}\, u\rvert + C,$
11.	$\int \frac{du}{\sin u} = \ln\left\lvert \mathrm{tg}\frac{u}{2}\right\rvert + C,$		
12.	$\int \frac{du}{\cos u} = \ln\left\lvert \mathrm{tg}\left(\frac{u}{2} + \frac{\pi}{4}\right)\right\rvert + C,$		
	Rational functions		**Irrational functions**
19.	$\int \frac{du}{a^2+u^2} = \begin{cases} \frac{1}{a}\mathrm{arctg}\frac{u}{a} + C, \\ -\frac{1}{a}\mathrm{arcctg}\frac{u}{a} + C, \end{cases}$	21.	$\int \frac{du}{\sqrt{a^2-u^2}} = \begin{cases} \arcsin\frac{u}{a} + C, \\ -\arccos\frac{u}{a} + C, \end{cases}$
20.	$\int \frac{du}{u^2-a^2} = \frac{1}{2a}\ln\left\lvert\frac{u-a}{u+a}\right\rvert + C, \quad a \neq 0$	22.	$\int \frac{du}{\sqrt{u^2 \pm a^2}} = \ln\left\lvert u + \sqrt{u^2 \pm a^2}\right\rvert + C,$

	Additional formulas
23.	$\int \sqrt{a^2-u^2}\,du = \frac{u}{2}\sqrt{a^2-u^2} + \frac{a^2}{2}\arcsin\frac{u}{a} + C, \quad a \neq 0\,,$
24.	$\int \sqrt{u^2 \pm a^2}\,du = \frac{u}{2}\sqrt{u^2 \pm a^2} \pm \frac{a^2}{2}\ln\left\lvert u + \sqrt{u^2 \pm a^2}\right\rvert + C, \quad a \neq 0.$

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Електронне мережеве навчальне видання

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ВИЩА МАТЕМАТИКА
НЕВИЗНАЧЕНИЙ ІНТЕГРАЛ

Практикум

(Англійською мовою)

Практикум до розділу «Невизначений інтеграл» з курсу «Вища математика» для студентів технічних спеціальностей містить 31 варіант, кожен варіант складається з 36 задач. Самостійне виконання цих завдань забезпечує свідоме оволодіння навчальним матеріалом, який передбачено робочою програмою з вищої математики.

Практикум може бути рекомендований в якості розрахункової роботи по темі «Невизначений інтеграл» для студентів першого курсу технічних спеціальностей.

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