

Работа состоит из нескольких заданий. Второе число задания (после точки) соответствует номеру первой буквы фамилии студента в алфавите, **Ъ и Ъ знаки пропускаются** (например, у Алешиной это задания 1.1, 2.1, 3.1 и т.д., у Бурлакова – 1.2, 2.2, 3.2 и т.д., у Яковлевой – 1.31, 2.31, 3.31 и т.д.).

Интегралы

1. Вычислить неопределенные интегралы.

1.1. $\int (4 - 3x)e^{-3x} dx.$

1.2. $\int \operatorname{arctg} \sqrt{4x - 1} dx.$

1.3. $\int (3x + 4)e^{3x} dx.$

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

1.5. $\int (4 - 16x)\sin 4x dx.$

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

1.7. $\int (1 - 6x)e^{2x} dx.$

1.8. $\int \ln(x^2 + 4) dx.$

1.9. $\int \ln(4x^2 + 1) dx.$

1.10. $\int (2 - 4x)\sin 2x dx.$

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

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

1.13. $\int e^{-3x}(2 - 9x) dx.$

1.14. $\int \operatorname{arctg} \sqrt{2x - 1} dx.$

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

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

1.17. $\int (5x + 6)\cos 2x dx.$

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

1.19. $\int (x\sqrt{2} - 3)\cos 2x dx.$

1.20. $\int (4x + 7)\cos 3x dx.$

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

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

1.23. $\int (x + 5)\sin 3x dx.$

1.24. $\int (2 - 3x)\sin 2x dx.$

1.25. $\int (4x + 3)\sin 5x dx.$

1.26. $\int (7x - 10)\sin 4x dx.$

1.27. $\int (\sqrt{2} - 8x)\sin 3x dx.$

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

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

1.30. $\int x \sin^2 x dx.$

$$1.31. \int \frac{x \cos x dx}{\sin^3 x}.$$

2. Вычислить определенные интегралы.

$$2.1. \int_{-2}^0 (x^2 + 5x + 6) \cos 2x dx.$$

$$2.2. \int_{-2}^0 (x^2 - 4) \cos 3x dx.$$

$$2.3. \int_{-1}^0 (x^2 + 4x + 3) \cos x dx.$$

$$2.4. \int_{-2}^0 (x + 2)^2 \cos 3x dx.$$

$$2.5. \int_{-4}^0 (x^2 + 7x + 12) \cos x dx.$$

2.6.

$$\int_0^{\pi} (2x^2 + 4x + 7) \cos 2x dx.$$

$$2.7. \int_0^{\pi} (9x^2 + 9x + 11) \cos 3x dx.$$

2.8.

$$\int_0^{\pi} (8x^2 + 16x + 17) \cos 4x dx.$$

$$2.9. \int_0^{2\pi} (3x^2 + 5) \cos 2x dx.$$

$$2.10. \int_0^{2\pi} (2x^2 - 15) \cos 3x dx.$$

$$2.11. \int_0^{2\pi} (3 - 7x^2) \cos 2x dx.$$

$$2.12. \int_0^{2\pi} (1 - 8x^2) \cos 4x dx.$$

$$2.13. \int_{-1}^0 (x^2 + 2x + 1) \sin 3x dx.$$

2.14.

$$\int_0^3 (x^2 - 3x) \sin 2x dx.$$

$$2.15. \int_0^{\pi} (x^2 - 3x + 2) \sin x dx.$$

$$2.16. \int_0^{\frac{\pi}{2}} (x^2 - 5x + 6) \sin 3x dx.$$

$$2.17. \int_{-3}^0 (x^2 + 6x + 9) \sin 2x dx.$$

$$2.18. \int_0^{\frac{\pi}{4}} (x^2 + 17,5) \sin 2x dx.$$

$$2.19. \int_0^{\frac{\pi}{2}} (1 - 5x^2) \sin x dx.$$

$$2.20. \int_{\frac{\pi}{4}}^3 (3x - x^2) \sin 2x dx.$$

$$2.21. \int_1^2 x \ln^2 x dx.$$

$$2.22. \int_1^{e^2} \frac{\ln^2 x dx}{\sqrt{x}}.$$

$$2.23. \int_1^8 \frac{\ln^2 x dx}{\sqrt[3]{x^2}}.$$

$$2.24. \int_0^1 (x+1) \ln^2 (x+1) dx.$$

$$2.25. \int_2^3 (x-1)^3 \ln^2 (x-1) dx.$$

$$2.26. \int_{-1}^0 (x+2)^3 \ln^2 (x+2) dx.$$

$$2.27. \int_0^2 (x+1)^2 \ln^2 (x+1) dx.$$

$$2.28. \int_1^e \sqrt{x} \ln^2 x dx.$$

$$2.29. \int_{-1}^1 x^2 e^{\frac{x}{2}} dx.$$

$$2.30. \int_0^1 x^2 e^{3x} dx.$$

$$2.31. \int_{-2}^0 (x^2 + 2) e^{\frac{x}{2}} dx.$$

3. Найти неопределенные интегралы.

$$3.1. \int \frac{dx}{x\sqrt{x^2+1}}.$$

$$3.2. \int \frac{1+\ln x}{x} dx.$$

$$3.3. \int \frac{dx}{x\sqrt{x^2-1}}.$$

$$3.4. \int \frac{x^2 + \ln x^2}{x} dx.$$

$$3.5. \int \frac{xdx}{\sqrt{x^4+x^2+1}}.$$

$$3.6. \int \frac{(\arccos x)^3 - 1}{\sqrt{1-x^2}} dx.$$

$$3.7. \int \operatorname{tg} x \ln \cos x dx.$$

$$3.8. \int \frac{\operatorname{tg}(x+1)}{\cos^2(x+1)} dx.$$

$$3.9. \int \frac{x^3}{(x^2+1)^2} dx.$$

$$3.10. \int \frac{1-\cos x}{(x-\sin x)^2} dx.$$

$$3.11. \int \frac{\sin x - \cos x}{(\cos x + \sin x)^5} dx.$$

$$3.12. \int \frac{x \cos x + \sin x}{(x \sin x)^2} dx.$$

$$3.13. \int \frac{x^3 + x}{x^4 + 1} dx.$$

$$3.14. \int \frac{x dx}{\sqrt{x^4 - x^2 - 1}}.$$

$$3.15. \int \frac{x dx}{\sqrt[3]{x-1}}.$$

$$3.16. \int \frac{1 + \ln(x-1)}{x-1} dx.$$

$$3.17. \int \frac{(x^2+1) dx}{(x^3+3x+1)^5}.$$

$$3.18. \int \frac{4 \operatorname{arctg} x - x}{1+x^2} dx.$$

$$3.19. \int \frac{x^3}{x^2+4} dx.$$

$$3.20. \int \frac{x + \cos x}{x^2 + 2 \sin x} dx.$$

$$3.21. \int \frac{2 \cos x + 3 \sin x}{(2 \sin x - 3 \cos x)^3} dx.$$

$$3.22. \int \frac{8x - \operatorname{arctg} 2x}{1+4x^2} dx.$$

$$3.23. \int \frac{1/(2\sqrt{x})+1}{(\sqrt{x}+x)^2} dx.$$

$$3.24. \int \frac{x}{x^4+1} dx.$$

$$3.25. \int \frac{x+1/x}{\sqrt{x^2+1}} dx.$$

$$3.26. \int \frac{x-1/x}{\sqrt{x^2+1}} dx.$$

$$3.27. \int \frac{\operatorname{arctg} x + x}{1+x^2} dx.$$

$$3.28. \int \frac{x - (\operatorname{arctg} x)^4}{1+x^2} dx.$$

$$3.29. \int \frac{x^3}{x^2+1} dx.$$

$$3.30. \int \frac{(\arcsin x)^2 + 1}{\sqrt{1-x^2}} dx.$$

$$3.31. \int \frac{1 - \sqrt{x}}{\sqrt{x}(x+1)} dx.$$

4. Вычислить определенные интегралы.

$$4.1. \int_{e+1}^{e^2+1} \frac{1 + \ln(x-1)}{x-1} dx.$$

$$4.2. \int_0^1 \frac{(x^2 + 1) dx}{(x^3 + 3x + 1)^2}.$$

$$4.3. \int_0^1 \frac{4 \operatorname{arctg} x - x}{1 + x^2} dx.$$

$$4.4. \int_0^2 \frac{x^3 dx}{x^2 + 4}.$$

$$4.5. \int_{\pi}^{2\pi} \frac{x + \cos x}{x^2 + 2 \sin x} dx.$$

$$4.6. \int_0^{\pi/4} \frac{2 \cos x + 3 \sin x}{(2 \sin x - 3 \cos x)^3} dx.$$

$$4.7. \int_0^{1/2} \frac{8x - \operatorname{arctg} 2x}{1 + 4x^2} dx.$$

$$4.8. \int_1^4 \frac{1/(2\sqrt{x}) + 1}{(\sqrt{x} + x)^2} dx.$$

$$4.9. \int_0^1 \frac{x dx}{x^4 + 1}.$$

$$4.10. \int_{\sqrt{3}}^{\sqrt{8}} \frac{x + 1/x}{\sqrt{x^2 + 1}} dx.$$

$$4.11. \int_{\sqrt{3}}^{\sqrt{8}} \frac{x - 1/x}{\sqrt{x^2 + 1}} dx.$$

$$4.12. \int_0^{\sqrt{3}} \frac{\operatorname{arctg} x + x}{1 + x^2} dx.$$

$$4.13. \int_0^{\sqrt{3}} \frac{x - (\operatorname{arctg} x)^4}{1 + x^2} dx.$$

$$4.14. \int_0^1 \frac{x^3}{x^2 + 1} dx.$$

$$4.15. \int_0^{\sin^{-1} 1} \frac{(\arcsin x)^2 + 1}{\sqrt{1 - x^2}} dx.$$

$$4.16. \int_1^3 \frac{1 - \sqrt{x}}{\sqrt{x}(x+1)} dx.$$

$$4.17. \int_{\sqrt{3}}^{\sqrt{8}} \frac{dx}{x\sqrt{x^2 + 1}}.$$

$$4.18. \int_1^e \frac{1 + \ln x}{x} dx.$$

$$4.19. \int_{\sqrt{2}}^2 \frac{dx}{x\sqrt{x^2 - 1}}.$$

$$4.20. \int_1^e \frac{x^2 + \ln x^2}{x} dx.$$

$$4.21. \int_0^1 \frac{xdx}{\sqrt{x^4 + x^2 + 1}}.$$

$$4.22. \int_0^1 \frac{x^3 dx}{(x^2 + 1)^2}.$$

$$4.23. \int_0^{\pi/4} \operatorname{tg} x \ln \cos x dx.$$

$$4.24. \int_{-1}^0 \frac{\operatorname{tg}(x+1)}{\cos^2(x+1)} dx.$$

$$4.25. \int_0^{1/\sqrt{2}} \frac{(\arccos x)^3 - 1}{\sqrt{1-x^2}} dx.$$

$$4.26. \int_{\pi}^{2\pi} \frac{1 - \cos x}{(x - \sin x)^2} dx.$$

$$4.27. \int_0^{\pi/4} \frac{\sin x - \cos x}{(\cos x + \sin x)^5} dx.$$

$$4.28. \int_{\pi/4}^{\pi/2} \frac{x \cos x + \sin x}{(x \sin x)^2} dx.$$

$$4.29. \int_0^1 \frac{x^3 + x}{x^4 + 1} dx.$$

$$4.30. \int_{\sqrt{2}}^{\sqrt{3}} \frac{xdx}{\sqrt{x^4 - x^2 - 1}}.$$

$$4.31. \int_2^9 \frac{xdx}{\sqrt[3]{x-1}}.$$

5. Найти неопределенные интегралы.

$$5.1. \int \frac{x^3 + 1}{x^2 - x} dx.$$

$$5.2. \int \frac{3x^3 + 1}{x^2 - 1} dx.$$

$$5.3. \int \frac{x^3 - 17}{x^2 - 4x + 3} dx.$$

$$5.4. \int \frac{2x^3 + 5}{x^2 - x - 2} dx.$$

$$5.5. \int \frac{2x^3 - 1}{x^2 + x - 6} dx.$$

$$5.6. \int \frac{3x^3 + 25}{x^2 + 3x + 2} dx.$$

$$5.7. \int \frac{x^3 + 2x^2 + 3}{(x-1)(x-2)(x-3)} dx.$$

$$5.8. \int \frac{3x^3 + 2x^2 + 1}{(x+2)(x-2)(x-1)} dx.$$

$$5.9. \int \frac{x^3}{(x-1)(x+1)(x+2)} dx.$$

$$5.10. \int \frac{x^3 - 3x^2 - 12}{(x-4)(x-3)(x-2)} dx.$$

$$5.11. \int \frac{x^3 - 3x^2 - 12}{(x-4)(x-3)x} dx.$$

$$5.12. \int \frac{4x^3 + x^2 + 2}{x(x-1)(x-2)} dx.$$

$$5.13. \int \frac{3x^3 - 2}{x^3 - x} dx.$$

$$5.14. \int \frac{x^3 - 3x^2 - 12}{(x-4)(x-2)x} dx.$$

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

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

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

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

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

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

5.27. $\int \frac{x^5 - x^4 - 6x^3 + 13x + 6}{x(x-3)(x+2)} dx.$

5.29. $\int \frac{2x^4 + 2x^3 - 3x^2 + 2x - 9}{x(x-1)(x+3)} dx.$

5.31. $\int \frac{2x^3 - 40x - 8}{x(x+4)(x-2)} dx.$

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

5.18. $\int \frac{3x^5 - 12x^3 - 7}{x^2 + 2x} dx.$

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

5.22. $\int \frac{x^5 + 2x^4 - 2x^3 + 5x^2 - 7x + 9}{(x+3)(x-1)x} dx.$

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

5.26. $\int \frac{2x^4 + 2x^3 - 41x^2 + 20}{x(x-4)(x+5)} dx.$

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

5.30. $\int \frac{2x^3 - x^2 - 7x - 12}{x(x-3)(x+1)} dx.$

6. Найти неопределенные интегралы.

6.1. $\int \frac{x^3 + 6x^2 + 13x + 9}{(x+1)(x+2)^3} dx.$

6.2. $\int \frac{x^3 + 6x^2 + 13x + 8}{x(x+2)^3} dx.$

6.3. $\int \frac{x^3 - 6x^2 + 13x - 6}{(x+2)(x-2)^3} dx.$

6.4. $\int \frac{x^3 + 6x^2 + 14x + 10}{(x+1)(x+2)^3} dx.$

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

6.6. $\int \frac{x^3 + 6x^2 + 11x + 7}{(x+1)(x+2)^3} dx.$

6.7. $\int \frac{2x^3 + 6x^2 + 7x + 1}{(x-1)(x+1)^3} dx.$

6.8. $\int \frac{x^3 + 6x^2 + 10x + 10}{(x-1)(x+2)^3} dx.$

6.9. $\int \frac{2x^3 + 6x^2 + 7x + 2}{x(x+1)^3} dx.$

6.10. $\int \frac{x^3 - 6x^2 + 13x - 8}{x(x-2)^3} dx.$

6.11.
$$\int \frac{x^3 - 6x^2 + 13x - 7}{(x+1)(x-2)^3} dx.$$

6.12.
$$\int \frac{x^3 - 6x^2 + 14x - 6}{(x+1)(x-2)^3} dx.$$

6.13.
$$\int \frac{x^3 - 6x^2 + 10x - 10}{(x+1)(x-2)^3} dx.$$

6.14.
$$\int \frac{x^3 + x + 2}{(x+2)x^3} dx.$$

6.15.
$$\int \frac{3x^3 + 9x^2 + 10x + 2}{(x-1)(x+1)^3} dx.$$

6.16.
$$\int \frac{2x^3 + x + 1}{(x+1)x^3} dx.$$

6.17.
$$\int \frac{2x^3 + 6x^2 + 7x + 4}{(x+2)(x+1)^3} dx.$$

6.18.
$$\int \frac{2x^3 + 6x^2 + 5x}{(x+2)(x+1)^3} dx.$$

6.19.
$$\int \frac{2x^3 + 6x^2 + 7x}{(x-2)(x+1)^3} dx.$$

6.20.
$$\int \frac{2x^3 + 6x^2 + 5x + 4}{(x-2)(x+1)^3} dx.$$

6.21.
$$\int \frac{x^3 + 6x^2 + 4x + 24}{(x-2)(x+2)^3} dx.$$

6.22.
$$\int \frac{x^3 + 6x^2 + 14x + 4}{(x-2)(x+2)^3} dx.$$

6.23.
$$\int \frac{x^3 + 6x^2 + 18x - 4}{(x-2)(x+2)^3} dx.$$

6.24.
$$\int \frac{x^3 + 6x^2 + 10x + 12}{(x-2)(x+2)^3} dx.$$

6.25.
$$\int \frac{x^3 - 6x^2 + 14x - 4}{(x+2)(x-2)^3} dx.$$

6.26.
$$\int \frac{x^3 + 6x^2 + 15x + 2}{(x-2)(x+2)^3} dx.$$

6.27.
$$\int \frac{2x^3 - 6x^2 + 7x - 4}{(x-2)(x-1)^3} dx.$$

6.28.
$$\int \frac{2x^3 - 6x^2 + 7x}{(x+2)(x-1)^3} dx.$$

6.29.
$$\int \frac{x^3 + 6x^2 - 10x + 52}{(x-2)(x+2)^3} dx.$$

6.30.
$$\int \frac{x^3 - 6x^2 + 13x - 6}{(x+2)(x-2)^3} dx.$$

6.31.
$$\int \frac{x^3 + 6x^2 + 13x + 6}{(x-2)(x+2)^3} dx.$$

7. Найти неопределенные интегралы.

7.1.
$$\int \frac{x^3 + 4x^2 + 4x + 2}{(x+1)^2(x^2 + x + 1)} dx.$$

7.2.
$$\int \frac{x^3 + 4x^2 + 3x + 2}{(x+1)^2(x^2 + 1)} dx.$$

7.3.
$$\int \frac{2x^3 + 7x^2 + 7x - 1}{(x+2)^2(x^2+x+1)} dx.$$

7.4.
$$\int \frac{2x^3 + 4x^2 + 2x - 1}{(x+1)^2(x^2+2x+2)} dx.$$

7.5.
$$\int \frac{x^3 + 6x^2 + 9x + 6}{(x+1)^2(x^2+2x+2)} dx.$$

7.6.
$$\int \frac{2x^3 + 11x^2 + 16x + 10}{(x+2)^2(x^2+2x+3)} dx.$$

7.7.
$$\int \frac{3x^3 + 6x^2 + 5x - 1}{(x+1)^2(x^2+2)} dx.$$

7.8.
$$\int \frac{x^3 + 9x^2 + 21x + 21}{(x+3)^2(x^2+3)} dx.$$

7.9.
$$\int \frac{x^3 + 6x^2 + 8x + 8}{(x+2)^2(x^2+4)} dx.$$

7.10.
$$\int \frac{x^3 + 5x^2 + 12x + 4}{(x+2)^2(x^2+4)} dx.$$

7.11.
$$\int \frac{2x^3 - 4x^2 - 16x - 12}{(x-1)^2(x^2+4x+5)} dx.$$

7.12.
$$\int \frac{-3x^3 + 13x^2 - 13x + 1}{(x-2)^2(x^2-x+1)} dx.$$

7.13.
$$\int \frac{x^3 + 2x^2 + 10x}{(x+1)^2(x^2-x+1)} dx.$$

7.14.
$$\int \frac{3x^3 + x + 46}{(x-1)^2(x^2+9)} dx.$$

7.15.
$$\int \frac{4x^3 + 24x^2 + 20x - 28}{(x+3)^2(x^2+2x+2)} dx.$$

7.16.
$$\int \frac{2x^3 + 3x^2 + 3x + 2}{(x^2+x+1)(x^2+1)} dx.$$

7.17.
$$\int \frac{x^3 + x + 1}{(x^2+x+1)(x^2+1)} dx.$$

7.18.
$$\int \frac{x^2 + x + 3}{(x^2+x+1)(x^2+1)} dx.$$

7.19.
$$\int \frac{2x^3 + 4x^2 + 2x + 2}{(x^2+x+1)(x^2+x+2)} dx.$$

7.20.
$$\int \frac{2x^3 + 7x^2 + 7x + 9}{(x^2+x+1)(x^2+x+2)} dx.$$

7.21.
$$\int \frac{4x^2 + 3x + 4}{(x^2+1)(x^2+x+1)} dx.$$

7.22.
$$\int \frac{3x^3 + 4x^2 + 6x}{(x^2+2)(x^2+2x+2)} dx.$$

7.23.
$$\int \frac{2x^2 - x + 1}{(x^2-x+1)(x^2+1)} dx.$$

7.24.
$$\int \frac{x^3 + x^2 + 1}{(x^2-x+1)(x^2+1)} dx.$$

7.25.
$$\int \frac{x^3 + x + 1}{(x^2-x+1)(x^2+1)} dx.$$

7.26.
$$\int \frac{2x^3 + 2x + 1}{(x^2-x+1)(x^2+1)} dx.$$

$$7.28. \int \frac{x^3 + 2x^2 + x + 1}{(x^2 + x + 1)(x^2 + 1)} dx.$$

$$7.29. \int \frac{x + 4}{(x^2 + x + 2)(x^2 + 2)} dx.$$

$$7.30. \int \frac{2x^3 + 2x^2 + 2x + 1}{(x^2 + x + 1)(x^2 + 1)} dx.$$

$$7.30. \int \frac{3x^3 + 7x^2 + 12x + 6}{(x^2 + x + 3)(x^2 + 2x + 3)} dx.$$

$$7.31. \int \frac{2x^3 + 3x^2 + 3x + 2}{(x^2 + x + 1)(x^2 + 1)} dx.$$

8. Вычислить определенные интегралы.

$$8.1. \int_{\pi/2}^{2 \operatorname{arctg} 2} \frac{dx}{\sin^2 x (1 - \cos x)}.$$

$$8.2. \int_0^{\pi/2} \frac{\cos x dx}{2 + \cos x}.$$

$$8.3. \int_{\pi/2}^{2 \operatorname{arctg} 2} \frac{dx}{\sin^2 x (1 + \cos x)}.$$

$$8.4. \int_{2 \operatorname{arctg}(1/2)}^{\pi/2} \frac{\cos x dx}{(1 - \cos x)^3}.$$

$$8.5. \int_0^{\pi/2} \frac{\cos x - \sin x}{(1 + \sin x)^2} dx.$$

$$8.6. \int_{2 \operatorname{arctg} 2}^{2 \operatorname{arctg} 3} \frac{dx}{\cos x (1 - \cos x)}.$$

$$8.7. \int_{2 \operatorname{arctg}(1/3)}^{2 \operatorname{arctg}(1/2)} \frac{dx}{\sin x (1 - \sin x)}.$$

$$8.8. \int_{2 \operatorname{arctg}(1/2)}^{\pi/2} \frac{dx}{(1 + \sin x - \cos x)^2}.$$

$$8.9. \int_0^{\pi/2} \frac{\cos x dx}{5 + 4 \cos x}.$$

$$8.10. \int_0^{2\pi/3} \frac{1 + \sin x}{1 + \cos x + \sin x} dx.$$

$$8.11. \int_{\pi/3}^{\pi/2} \frac{\cos x dx}{1 + \sin x - \cos x}.$$

$$8.12. \int_0^{\pi/2} \frac{(1 + \cos x) dx}{1 + \sin x + \cos x}.$$

$$8.13. \int_0^{\pi/2} \frac{\sin dx}{1 + \sin x + \cos x}.$$

$$8.14. \int_0^{2 \operatorname{arctg}(1/2)} \frac{1 + \sin x}{(1 - \sin x)^2} dx.$$

$$8.15. \int_0^{\pi/2} \frac{\cos x dx}{1 + \sin x + \cos x}.$$

$$8.16. \int_0^{2 \operatorname{arctg}(1/3)} \frac{\cos x dx}{(1 - \sin x)(1 + \cos x)}.$$

$$8.17. \int_{-2\pi/3}^0 \frac{\cos x dx}{1 + \cos x - \sin x}.$$

$$8.18. \int_{-\pi/2}^0 \frac{\cos x dx}{(1 + \cos x - \sin x)^2}.$$

$$8.19. \int_0^{\pi/2} \frac{\cos x dx}{(1 + \cos x + \sin x)^2}.$$

$$8.20. \int_0^{2 \operatorname{arctg}(1/2)} \frac{(1 - \sin x) dx}{\cos x (1 + \cos x)}.$$

$$8.21. \int_0^{\pi/2} \frac{\sin x dx}{(1 + \sin x)^2}.$$

$$8.22. \int_0^{\pi/2} \frac{\sin x dx}{(1 + \cos x + \sin x)^2}.$$

$$8.23. \int_{-\pi/2}^0 \frac{\sin x dx}{(1 + \cos x - \sin x)^2}.$$

$$8.24. \int_{-2\pi/3}^0 \frac{\cos^2 x dx}{(1 + \cos x - \sin x)^2}.$$

$$8.25. \int_0^{\pi/2} \frac{\sin^2 x dx}{(1 + \cos x + \sin x)^2}.$$

$$8.26. \int_0^{2\pi/3} \frac{\cos^2 x dx}{(1 + \cos x + \sin x)^2}.$$

$$8.27. \int_{\pi/2}^{2 \operatorname{arctg} 2} \frac{dx}{\sin x (1 + \sin x)}.$$

$$8.28. \int_0^{\pi/2} \frac{dx}{(1 + \cos x + \sin x)^2}.$$

$$8.29. \int_0^{\pi/2} \frac{\sin x dx}{2 + \sin x}.$$

$$8.30. \int_0^{\pi/4} \frac{dx}{\cos x (1 + \cos x)}.$$

$$8.31. \int_0^{\pi/2} \frac{\sin x dx}{5 + 3 \sin x}.$$

9. Вычислить определенные интегралы.

$$9.1. \int_{\pi/4}^{\operatorname{arctg} 3} \frac{dx}{(3 \operatorname{tg} x + 5) \sin 2x}.$$

$$9.2. \int_{\arccos(4/\sqrt{17})}^{\pi/4} \frac{2 \operatorname{ctg} x + 1}{(2 \sin x + \cos x)^2} dx.$$

$$9.3. \int_0^{\arccos(1/\sqrt{17})} \frac{3 + 2 \operatorname{tg} x}{2 \sin^2 x + 3 \cos^2 x - 1} dx.$$

$$9.4. \int_{\pi/4}^{\operatorname{arctg} 3} \frac{4 \operatorname{tg} x - 5}{1 - \sin 2x + 4 \cos^2 x} dx.$$

$$9.5. \int_0^{\operatorname{arctg}(1/3)} \frac{(8 + \operatorname{tg} x)}{18 \sin^2 x + 2 \cos^2 x} dx.$$

$$9.6. \int_0^{\arccos \sqrt{2/3}} \frac{\operatorname{tg} x + 2}{\sin^2 x + 2 \cos^2 x - 3} dx.$$

$$9.7. \int_{\arcsin(1/\sqrt{37})}^{\pi/4} \frac{6 \operatorname{tg} x dx}{3 \sin 2x + 5 \cos^2 x}.$$

$$9.8. \int_0^{\pi/4} \frac{2 \operatorname{tg}^2 x - 11 \operatorname{tg} x - 22}{4 - \operatorname{tg} x} dx.$$

$$9.9. \int_{-\operatorname{arctg}(1/3)}^0 \frac{3 \operatorname{tg} x + 1}{2 \sin 2x - 5 \cos 2x + 1} dx.$$

$$9.10. \int_{\pi/4}^{\operatorname{arctg} 3} \frac{1 + \operatorname{ctg} x}{(\sin x + 2 \cos x)^2} dx.$$

$$9.11. \int_{\pi/4}^{\arccos(1/\sqrt{3})} \frac{\operatorname{tg} x}{\sin^2 x - 5 \cos^2 x + 4} dx.$$

$$9.12. \int_0^{\pi/4} \frac{6 \sin^2 x}{3 \cos 2x - 4} dx.$$

$$9.13. \int_0^{\operatorname{arctg} 3} \frac{4 + \operatorname{tg} x}{2 \sin^2 x + 18 \cos^2 x} dx.$$

$$9.14. \int_0^{\operatorname{arctg} 2} \frac{12 + \operatorname{tg} x}{3 \sin^2 x + 12 \cos^2 x} dx.$$

$$9.15. \int_0^{\operatorname{arctg}(2/3)} \frac{6 + \operatorname{tg} x}{9 \sin^2 x + 4 \cos^2 x} dx.$$

$$9.16. \int_0^{\arcsin \sqrt{3/7}} \frac{\operatorname{tg}^2 x dx}{3 \sin^2 x + 4 \cos^2 x - 7}.$$

$$9.17. \int_0^{\pi/4} \frac{7 + 3 \operatorname{tg} x}{(\sin x + 2 \cos x)^2} dx.$$

$$9.18. \int_{\arcsin(2/\sqrt{5})}^{\arcsin(3/\sqrt{10})} \frac{2 \operatorname{tg} x + 5}{(5 - \operatorname{tg} x) \sin 2x} dx.$$

$$9.19. \int_{-\arccos(1/\sqrt{10})}^0 \frac{3 \operatorname{tg}^2 x - 50}{2 \operatorname{tg} x + 7} dx.$$

$$9.20. \int_0^{\pi/4} \frac{5 \operatorname{tg} x + 2}{2 \sin 2x + 5} dx.$$

$$9.21. \int_{\pi/4}^{\arcsin(2/\sqrt{5})} \frac{4 \operatorname{tg} x - 5}{4 \cos^2 x - \sin 2x + 1} dx.$$

$$9.22. \int_0^{\arcsin \sqrt{7/8}} \frac{6 \sin^2 x}{4 + 3 \cos 2x} dx.$$

$$9.23. \int_{-\arccos(1/\sqrt{5})}^0 \frac{11 - 3 \operatorname{tg} x}{\operatorname{tg} x + 3} dx.$$

$$9.24. \int_0^{\arcsin 3\sqrt{10}} \frac{2 \operatorname{tg} x - 5}{(4 \cos x - \sin x)^2} dx.$$

$$9.25. \int_{\pi/4}^{\arccos(1/\sqrt{26})} \frac{dx}{(6 - \operatorname{tg} x) \sin 2x}.$$

$$9.26. \int_0^{\pi/4} \frac{4 - 7 \operatorname{tg} x}{2 + 3 \operatorname{tg} x} dx.$$

$$9.27. \int_{-\arcsin(2/\sqrt{5})}^{\pi/4} \frac{2 - \operatorname{tg} x}{(\sin x + 3 \cos x)^2} dx.$$

$$9.28. \int_{\pi/4}^{\arcsin \sqrt{2/3}} \frac{8 \operatorname{tg} x dx}{3 \cos^2 x + 8 \sin 2x - 7}.$$

$$9.29. \int_{\arccos(1/\sqrt{10})}^{\arccos(1/\sqrt{26})} \frac{12dx}{(6 + 5 \operatorname{tg} x) \sin 2x}.$$

$$9.30. \int_0^{\pi/3} \frac{\operatorname{tg}^2 x}{4 + 3 \cos 2x} dx.$$

$$9.31. \int_0^{\arccos(1/\sqrt{6})} \frac{3 \operatorname{tg}^2 x - 1}{\operatorname{tg}^2 x + 5} dx.$$

10. Вычислить определенные интегралы.

$$10.1. \int_{\pi/2}^{\pi} 2^8 \sin^8 x dx.$$

$$10.2. \int_0^{\pi} 2^4 \sin^6 x \cos^2 x dx.$$

$$10.3. \int_0^{2\pi} \sin^4 x \cos^4 x dx.$$

$$10.4. \int_0^{2\pi} \sin^2(x/4) \cos^6(x/4) dx.$$

$$10.5. \int_0^{\pi} 2^4 \cos^8(x/2) dx.$$

$$10.6. \int_{-\pi/2}^0 2^8 \sin^8 x dx.$$

$$10.7. \int_{\pi/2}^{\pi} 2^4 \sin^6 x \cos^2 x dx.$$

$$10.8. \int_0^{\pi} 2^4 \sin^4 x \cos^4 x dx.$$

$$10.9. \int_0^{2\pi} \sin^2 x \cos^6 x dx.$$

$$10.10. \int_0^{2\pi} \cos^8(x/4) dx.$$

$$10.11. \int_0^{\pi} 2^4 \sin^8(x/2) dx.$$

$$10.12. \int_{-\pi}^0 2^8 \sin^6 x \cos^2 x dx.$$

$$10.13. \int_{\pi/2}^{2\pi} 2^8 \sin^4 x \cos^4 x dx.$$

$$10.14. \int_0^{\pi} 2^4 \sin^2 x \cos^6 x dx.$$

$$10.15. \int_0^{2\pi} \cos^8 x dx.$$

$$10.16. \int_0^{2\pi} \sin^8(x/4) dx.$$

$$10.17. \int_0^{\pi} 2^4 \sin^6(x/2) \cos^2(x/2) dx.$$

$$10.18. \int_{-\pi/2}^0 2^8 \sin^4 x \cos^4 x dx.$$

$$10.19. \int_{\pi/2}^{\pi} 2^8 \sin^2 x \cos^6 x \, dx.$$

$$10.20. \int_0^{\pi} 2^4 \cos^8 x \, dx.$$

$$10.21. \int_0^{2\pi} \sin^8 x \, dx.$$

$$10.22. \int_0^{2\pi} \sin^6(x/4) \cos^2(x/4) \, dx.$$

$$10.23. \int_0^{\pi} 2^4 \sin^4(x/2) \cos^4(x/2) \, dx.$$

$$10.24. \int_{-\pi/2}^0 2^8 \sin^2 x \cos^6 x \, dx.$$

$$10.25. \int_{\pi/2}^{2\pi} 2^8 \cos^8 x \, dx.$$

$$10.26. \int_0^{\pi} 2^4 \sin^8 x \, dx.$$

$$10.27. \int_0^{2\pi} \sin^6 x \cos^2 x \, dx.$$

$$10.28. \int_0^{2\pi} \sin^4(x/4) \cos^4(x/4) \, dx.$$

$$10.29. \int_0^{\pi} 2^4 \sin^2(x/2) \cos^6(x/2) \, dx.$$

$$10.30. \int_{-\pi/2}^0 2^8 \cos^8 x \, dx.$$

$$10.31. \int_0^{2\pi} \sin^4 3x \cos^4 3x \, dx.$$