Завдання 1. Обчислити інтеграли.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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Завдання 2. Обчислити інтеграли.

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. $\int \dfrac{dx}{\sqrt{1+x}}$.

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

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

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

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

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

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

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

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

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

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

Завдання 3. Обчислити інтеграли.

3.1. $\int \dfrac{\sqrt{3}dx}{9x^2-3}$.

3.2. $\int \dfrac{dx}{\sqrt{9x^2+3}}$.

3.3. $\int \dfrac{dx}{9x^2+3}$.

3.4. $\int \dfrac{9dx}{\sqrt{9x^2-3}}$.

3.5. $\int \dfrac{dx}{\sqrt{3-9x^2}}$.

3.6. $\int \dfrac{dx}{7x^2-4}$.

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

3.8. $\int \dfrac{dx}{5x^2+3}$.

3.9. $\int \dfrac{dx}{5x^2-3}$.

3.10. $\int \dfrac{dx}{\sqrt{3-5x^2}}$.

3.11. $\int \dfrac{dx}{\sqrt{5x^2+3}}$.

3.12. $\int \dfrac{dx}{\sqrt{4-7x^2}}$.

3.13. $\int \dfrac{\sqrt{5}dx}{\sqrt{3-4x^2}}$.

3.14. $\int \dfrac{dx}{\sqrt{2x^2-9}}$.

3.15. $\int \dfrac{dx}{2x^2+7}$.

3.16. $\int \dfrac{dx}{\sqrt{3x^2+1}}$.

3.17. $\int \dfrac{xdx}{\sqrt{5-4x^2}}$.

3.18. $\int \dfrac{xdx}{\sqrt{5-3x^2}}$.

3.19. $\int \dfrac{3xdx}{4x^2+1}$.

3.20. $\int \dfrac{4xdx}{\sqrt{3-4x^2}}$.

3.21. $\int \dfrac{dx}{\sqrt{2-5x^2}}$.

3.22. $\int \dfrac{dx}{2x^2-5}$.

3.23. $\int \dfrac{dx}{\sqrt{7x^2-3}}$.

3.24. $\int \dfrac{dx}{5x^2+2}$.

3.25. $\int \dfrac{dx}{2x^2+3}$.

3.26. $\int \dfrac{dx}{\sqrt{5x^2+1}}$.

3.27. $\int \dfrac{dx}{2x^2+9}$.

3.28. $\int \dfrac{dx}{\sqrt{9-2x^2}}$.

3.29. $\int \dfrac{dx}{\sqrt{9x^2+2}}$.

3.30. $\int \dfrac{dx}{5x^2-4}$.

Завдання 4. Обчислити інтеграли.

4.1. $\int \dfrac{dx}{(2x+1)\sqrt[3]{\ln^2(2x+1)}}$.

4.2. $\int \dfrac{\sqrt[3]{\ln^2(1-x)}}{x-1}\,dx$.

4.3. $\int \dfrac{dx}{(1-x)\sqrt[3]{\ln^2(1-x)}}$.

4.4. $\int \dfrac{dx}{(1-x)\sqrt{\ln^3(1-x)}}$.

4.5. $\int \dfrac{\ln^3(1-x)}{x-1}\,dx$.

4.6. $\int \dfrac{\sqrt{\ln(2x-1)}}{2x-1}\,dx$.

4.7. $\int \dfrac{\sqrt[3]{\ln(3x+1)}}{3x+1}\,dx$.

4.8. $\int \dfrac{dx}{(x+1)\ln^2(x+1)}$.

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

4.10. $\int \dfrac{dx}{(x+1)\ln^2(x+1)}$.

4.11. $\int \dfrac{\sqrt{\ln^5(x+1)}}{x+1}\,dx$.

4.12. $\int \dfrac{\sqrt[7]{\ln^2(x+1)}}{x+1}\,dx$.

4.13. $\int \dfrac{\sqrt{\ln^3(x+1)}}{x+1}\,dx$.

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

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

4.16. $\int \dfrac{dx}{(x+2)\sqrt{\ln(x+2)}}$.

4.17. $\int \dfrac{\sqrt{\ln^3(x+1)}}{x+1}\,dx$.

4.18. $\int \dfrac{dx}{(x-3)\ln^4(x-3)}$.

4.19. $\int \dfrac{\sqrt{\ln^5(x+1)}}{x+1}\,dx$.

4.20. $\int \dfrac{\ln^3(x-5)}{x-5}\,dx$.

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

4.22. $\int \dfrac{dx}{(x-3)\ln^4(x-3)}$.

4.23. $\int \dfrac{\sqrt{\ln^3(x+3)}}{x+3}\,dx$.

4.24. $\int \dfrac{\sqrt[3]{\ln^4(x-5)}}{x-5}\,dx$.

4.25. $\int \dfrac{\sqrt{\ln^3(x+3)}}{x+3}\,dx$.

4.26. $\int \dfrac{\ln^5(x-8)}{x-8}\,dx$.

4.27. $\int \dfrac{\ln(3x+5)}{3x+5}\,dx$.

4.28. $\int \dfrac{dx}{(x-4)\ln^5(x-4)}$.

4.29. $\int \dfrac{\ln^6(x+9)}{x+9}\,dx$.

4.30. $\int \dfrac{\ln(3x+5)}{3x+5}\,dx$.

Завдання 5. Обчислити інтеграли.

5.1. $\int \dfrac{\sqrt{\operatorname{arctg}^6 3x}}{1+9x^2}\, dx$.

5.2. $\int \dfrac{\sqrt[3]{\arcsin x}}{\sqrt{1-x^2}}\, dx$.

5.3. $\int \dfrac{\arccos^2 3x}{\sqrt{1-9x^2}}\, dx$.

5.4. $\int \dfrac{\operatorname{arcctg}^3 2x}{1+4x^2}\, dx$.

5.5. $\int \dfrac{\sqrt[3]{\arccos^2 x}}{\sqrt{1-x^2}}\, dx$.

5.6. $\int \dfrac{dx}{(1+x^2)\operatorname{arctg}^3 x}$.

5.7. $\int \dfrac{\arccos^3 2x}{\sqrt{1-4x^2}}\, dx$.

5.8. $\int \dfrac{\sqrt[3]{\operatorname{arctg}^2 x}}{1+x^2}\, dx$.

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

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

5.11. $\int \dfrac{\arccos^3 2x}{\sqrt{1-4x^2}}\, dx$.

5.12. $\int \dfrac{\operatorname{arctg}^7 3x}{1+9x^2}\, dx$.

5.13. $\int \dfrac{\arccos 4x}{\sqrt{1-16x^2}}\, dx$.

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

5.15. $\int \dfrac{\arcsin^3 2x}{\sqrt{1-4x^2}}\, dx$.

5.16. $\int \dfrac{dx}{(1+x^2)\operatorname{arctg}^7 x}$.

5.17. $\int \dfrac{\sqrt[3]{\operatorname{arctg} 2x}}{1+4x^2}\, dx$.

5.18. $\int \dfrac{\arccos^6 3x}{\sqrt{1-9x^2}}\, dx$.

5.19. $\int \dfrac{\sqrt{\operatorname{arctg}^3 x}}{1+x^2}\, dx$.

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

5.21. $\int \dfrac{dx}{(1+x^2)\operatorname{arctg}^5 x}$.

5.22. $\int \dfrac{\arccos^7 x\, dx}{\sqrt{1-x^2}}$.

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

5.24. $\int \dfrac{\operatorname{arcctg}^4 5x}{1+25x^2}\, dx$.

5.25. $\int \dfrac{\arcsin^2 5x}{\sqrt{1-25x^2}}\, dx$.

5.26. $\int \dfrac{dx}{\sqrt{1-25x^2}\,\arcsin 5x}$.

5.27. $\int \dfrac{\operatorname{arctg}^8 3x}{1+9x^2}\, dx$.

5.28. $\int \dfrac{\arccos^2 7x}{\sqrt{1-49x^2}}\, dx$.

5.29. $\int \dfrac{\sqrt[5]{\operatorname{arctg}^3 x}}{1+x^2}\, dx$.

5.30. $\int \dfrac{\operatorname{arcctg}^4 8x}{1+64x^2}\, dx$.

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Завдання 6. Обчислити інтеграли.

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

6.2. $\int \dfrac{dx}{x^2 - 4x + 10}$.

6.3. $\int \dfrac{dx}{2x^2 - 7x + 1}$.

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

6.5. $\int \dfrac{dx}{5x^2 + 2x + 7}$.

6.6. $\int \dfrac{dx}{2x^2 - 2x + 1}$.

6.7. $\int \dfrac{dx}{2x^2 - 11x + 2}$.

6.8. $\int \dfrac{dx}{2x^2 + x + 2}$.

6.9. $\int \dfrac{dx}{3x^2 - 12x + 3}$.

6.10. $\int \dfrac{dx}{2x^2 + 3x + 2}$.

6.11. $\int \dfrac{dx}{x^2 - 5x + 6}$.

6.12. $\int \dfrac{dx}{2x - 3 - 4x^2}$.

6.13. $\int \dfrac{dx}{3x^2 - 8x - 3}$.

6.14. $\int \dfrac{dx}{8 - 2x - x^2}$.

6.15. $\int \dfrac{dx}{5x - x^2 - 6}$.

6.16. $\int \dfrac{dx}{\sqrt{4 + 8x - x^2}}$.

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

6.18. $\int \dfrac{dx}{\sqrt{2 - 3x - 2x^2}}$.

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

6.20. $\int \dfrac{dx}{\sqrt{2 + 8x - 2x^2}}$.

6.21. $\int \dfrac{dx}{\sqrt{3 + 2x - 2x^2}}$.

6.22. $\int \dfrac{dx}{2 - 2x - 3x^2}$.

6.23. $\int \dfrac{dx}{\sqrt{1 + x - x^2}}$.

6.24. $\int \dfrac{dx}{\sqrt{5x^2 - 10x + 4}}$.

6.25. $\int \dfrac{dx}{\sqrt{2x + 3 - x^2}}$.

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

6.27. $\int \dfrac{dx}{\sqrt{1 + 2x - x^2}}$.

6.28. $\int \dfrac{dx}{\sqrt{4x^2 - x + 4}}$.

6.29. $\int \dfrac{dx}{\sqrt{2 + 4x - 3x^2}}$.

6.30. $\int \dfrac{dx}{4x^2 + 2x + 4}$.

Завдання 7. Обчислити інтеграли.

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

7.2. $\int \dfrac{x+6}{3x^2+x+1}\,dx$.

7.3. $\int \dfrac{2x-1}{3x^2-2x+6}\,dx$.

7.4. $\int \dfrac{x\,dx}{2x^2+x+5}\,dx$.

7.5. $\int \dfrac{x+5}{x^2+x-2}\,dx$.

7.6. $\int \dfrac{3x-2}{5x^2-3x+2}\,dx$.

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

7.8. $\int \dfrac{x+4}{2x^2-7x+1}\,dx$.

7.9. $\int \dfrac{5x-2}{2x^2-5x+2}\,dx$.

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

7.11. $\int \dfrac{x+1}{2x^2+x+1}\,dx$.

7.12. $\int \dfrac{x+1}{3x^2-2x-3}\,dx$.

7.13. $\int \dfrac{4x+8}{4x^2+6x-13}\,dx$.

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

7.15. $\int \dfrac{x\,dx}{2x^2+2x+5}\,dx$.

7.16. $\int \dfrac{2x-13}{\sqrt{3x^2-3x-16}}\,dx$.

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

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

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

7.20. $\int \dfrac{2x+5}{\sqrt{4x^2+8x+9}}\,dx$.

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

7.22. $\int \dfrac{2x-8}{\sqrt{1-x+x^2}}\,dx$.

7.23. $\int \dfrac{3x+4}{\sqrt{x^2+6x+13}}\,dx$.

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

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

7.26. $\int \dfrac{x-4}{\sqrt{2x^2-x+7}}\,dx$.

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

7.28. $\int \dfrac{4x+1}{\sqrt{2+x-x^2}}\,dx$.

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

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

Завдання 8. Обчислити інтеграли.

8.1. $\int (x-7)\cos 2x dx$.

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

8.3. $\int (x-5)\cos x dx$.

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

8.5. $\int (x+8)\sin 3x dx$.

8.6. $\int (x+2)\sin \frac{x}{2} dx$.

8.7. $\int (x+4)\cos \frac{x}{2} dx$.

8.8. $\int (x-9)\sin \frac{x}{2} dx$.

8.9. $\int \ln(x-5) dx$.

8.10. $\int \operatorname{arctg} 2x dx$.

8.11. $\int x^2 e^{-x} dx$.

8.12. $\int \operatorname{arctg} 4x dx$.

8.13. $\int \arcsin 5x dx$.

8.14. $\int x \operatorname{arctg} x dx$.

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

8.16. $\int x\cos(x+4) dx$.

8.17. $\int \arcsin 2x dx$.

8.18. $\int (x^2-3)e^x dx$.

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

8.20. $\int \arcsin 3x dx$.

8.21. $\int x\sin(x-2) dx$.

8.22. $\int x\cos(x+4) dx$.

8.23. $\int x\sin(x-5) dx$.

8.24. $\int x\cos(x+6) dx$.

8.25. $\int \operatorname{arctg} \frac{x}{2} dx$.

8.26. $\int \ln(x+8) dx$.

8.27. $\int \ln(2x-1) dx$.

8.28. $\int \arccos \frac{x}{5} dx$.

8.29. $\int \operatorname{arctg} \frac{x}{4} dx$.

8.30. $\int \arccos \frac{x}{3} dx$.

Завдання 9. Обчислити інтеграли.

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

9.2. $\int \frac{x dx}{\sqrt{x+3}}$.

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

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

9.5. $\int \frac{x^3 dx}{\sqrt{x+1}}$

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

9.7. $\int \frac{dx}{(x+1)\sqrt{x+4}}$.

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

9.9. $\int \dfrac{dx}{\sqrt{x}+3}$.

9.10. $\int \dfrac{dx}{\sqrt{x}(x+3)}$.

9.11. $\int \dfrac{1+x}{x+\sqrt{x}}dx$.

9.12. $\int \dfrac{xdx}{\sqrt{x-1}}$.

9.13. $\int \dfrac{\sqrt{x}dx}{x-1}$.

9.14. $\int \dfrac{dx}{3+\sqrt{x+5}}$.

9.15. $\int \dfrac{dx}{1+\sqrt{x-1}}$.

9.16. $\int \dfrac{dx}{x\sqrt{x-7}}$.

9.17. $\int \dfrac{x+1}{x\sqrt{x-1}}dx$.

9.18. $\int \dfrac{x^3 dx}{\sqrt{x-7}}$.

9.19. $\int \dfrac{x^2 dx}{\sqrt{x-4}}$.

9.20. $\int \dfrac{\sqrt{x+4}}{x}dx$.

9.21. $\int \dfrac{x^3 dx}{\sqrt{x+2}}$.

9.22. $\int \dfrac{\sqrt{x}dx}{x+10}$.

9.23. $\int \dfrac{dx}{\sqrt{x}(x-1)}$.

9.24. $\int \dfrac{dx}{1+\sqrt{x-2}}$.

9.25. $\int \dfrac{dx}{x\sqrt{x-2}}$.

9.26. $\int \dfrac{x^2 dx}{\sqrt{x-2}}$.

9.27. $\int \dfrac{x-1}{x\sqrt{x-2}}dx$.

9.28. $\int \dfrac{x^3 dx}{\sqrt{x+6}}$.

9.29. $\int \dfrac{dx}{3+\sqrt{x-6}}$.

9.30. $\int \dfrac{dx}{2+\sqrt{x-8}}$.

Завдання 10. Обчислити інтеграли.

10.1. $\int \cos^4 3x \sin^2 3x dx$.

10.2. $\int \sqrt[5]{\sin^4 x} \cos^3 3x dx$.

10.3. $\int \cos^3 x \sin^8 x dx$.

10.4. $\int \cos^4 x \sin^3 x dx$.

10.5. $\int \dfrac{\cos^3 x dx}{\sqrt[3]{\sin^4 x}}$.

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

10.7. $\int \dfrac{\cos^3 x}{\sqrt[3]{\sin^2 x}}dx$.

10.8. $\int \dfrac{\sin^3 x}{\sqrt[3]{\cos^4 x}}dx$.

10.9. $\int \dfrac{3\sin^3 x}{\cos^4 x}dx$.

10.10. $\int \sin^5 x \cos^4 x dx$.

10.11. $\int \dfrac{\sin^3 x}{\sqrt[5]{\cos^3 x}}\,dx$.

10.12. $\int \sqrt[3]{\cos^2 x}\,\sin^3 xdx$.

10.13. $\int \sqrt[3]{\sin^2 x}\,\cos^3 xdx$.

10.14. $\int \sqrt[5]{\cos^3 2x}\,\sin^3 2xdx$.

10.15. $\int \dfrac{\cos^3 xdx}{\sqrt[5]{\sin^3 x}}$.

10.16. $\int \sin^2 2x\cos^4 2xdx$.

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

10.18. $\int \sqrt[5]{\cos^4 x}\,\sin^3 xdx$.

10.19. $\int \sin^4 2x\cos^2 2xdx$.

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

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

10.22. $\int \sin^4 x\cos^3 xdx$.

10.23. $\int \sin^2 x\cos^4 xdx$.

10.24. $\int \sin^4 x\cos^2 xdx$.

10.25. $\int \sin^3 x\cos^8 xdx$.

10.26. $\int \dfrac{3\cos^3 x}{\sin^4 x}\,dx$.

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

10.28. $\int \sin^4 x\cos^5 xdx$.

10.29. $\int \sin^4 3x\cos^2 3xdx$.

10.30. $\int \dfrac{\sin^3 x}{\sqrt[3]{\cos^4 x}}\,dx$.

Завдання 11. Користуючись формулою Ньютона-Лейбніца, обчислити інтеграли.

11.1. $\int\limits_0^{\sqrt3} x\sqrt[3]{1+x^2}\,dx$.

11.2. $\int\limits_0^{12\sqrt3} \dfrac{12x^5 dx}{\sqrt{x^6+1}}$.

11.3. $\int\limits_0^1 \dfrac{x^2 dx}{x^2+1}$.

11.4. $\int\limits_0^{\pi/2} \sin x\cos^2 xdx$.

11.5. $\int\limits_0^{\pi/2} \dfrac{\cos x}{1+\cos x}\,dx$.

11.6. $\int\limits_{3/4}^{4/3} \dfrac{dx}{x^2+1}$.

11.7. $\int\limits_0^{-3} \dfrac{dx}{\sqrt{25+3x}}$.

11.8. $\int\limits_0^2 \dfrac{x^3 dx}{\sqrt{x^4+4}}$.

11.9. $\int\limits_1^e \dfrac{1+\ln x}{x}\,dx$.

11.10. $\int\limits_0^1 \dfrac{x^3}{x^8+1}\,dx$.

11.11. $\displaystyle\int_{\pi/4}^{\pi/2}\frac{dx}{1-\cos^2 x}$.

11.12. $\displaystyle\int_{2}^{5}\frac{dx}{\sqrt{5+4x-x^2}}$.

11.13. $\displaystyle\int_{0}^{1}x^3\sqrt{4+5x^4}\,dx$.

11.14. $\displaystyle\int_{-\pi}^{\pi}\sin^2\frac{x}{2}\,dx$.

11.15. $\displaystyle\int_{1}^{2}\frac{e^{1/x}}{x^2}\,dx$.

11.16. $\displaystyle\int_{0}^{1/2}\frac{x\,dx}{\sqrt{1-x^2}}$.

11.17. $\displaystyle\int_{0}^{1}3(x^2+x^2 e^{x^3})\,dx$.

11.18. $\displaystyle\int_{\pi^2/9}^{\pi^2}\frac{\cos\sqrt{x}}{\sqrt{x}}\,dx$.

11.19. $\displaystyle\int_{1}^{\sqrt{3}}\frac{x^2\,dx}{1+x^6}$.

11.20. $\displaystyle\int_{1}^{e}\frac{\sin\ln x}{x}\,dx$.

11.21. $\displaystyle\int_{1}^{\sqrt{e}}\frac{dx}{x\sqrt{1-\ln^2 x}}$.

11.22. $\displaystyle\int_{3}^{8}\sqrt{x+1}\,dx$.

11.23. $\displaystyle\int_{\pi/6}^{\pi/2}\sin x\cos^3 x\,dx$.

11.24. $\displaystyle\int_{\pi/18}^{\pi/6}12\,\mathrm{ctg}\,3x\,dx$.

11.25. $\displaystyle\int_{0}^{1}\frac{dx}{\sqrt{4-3x}}$.

11.26. $\displaystyle\int_{1}^{\sqrt{2}}\frac{x\,dx}{\sqrt{4-x^2}}$.

11.27. $\displaystyle\int_{1}^{e}\frac{\ln^2 x}{x}\,dx$.

11.28. $\displaystyle\int_{-1}^{0}\frac{dx}{4x^2-9}$.

11.29. $\displaystyle\int_{\pi/6}^{\pi/2}\cos\alpha\sin^3\alpha\,d\alpha$.

11.30. $\displaystyle\int_{0}^{\sqrt{\pi}/4}\frac{x\,dx}{\cos^2(x^2)}$.

Завдання 12. Обчислити невласні інтеграли або довести їх розбіжність.

12.1. а) $\displaystyle\int_{0}^{\infty}\frac{x\,dx}{16x^4+1}$;

б) $\displaystyle\int_{0}^{1}\frac{dx}{\sqrt[3]{2-4x}}$.

12.2. а) $\displaystyle\int_{1}^{\infty}\frac{16x\,dx}{16x^4-1}$;

б) $\displaystyle\int_{1}^{3}\frac{dx}{\sqrt{x^2-6x+9}}$.

12.3. а) $\displaystyle\int_{0}^{\infty}\frac{x^3\,dx}{\sqrt{16x^4+1}}$;

б) $\displaystyle\int_{0}^{1/3}\frac{e^{3+\frac{1}{x}}}{x^2}\,dx$.

12.4. a) $\displaystyle\int\limits_{1}^{\infty}\frac{xdx}{\sqrt{16x^4-1}}$;

б) $\displaystyle\int\limits_{1}^{3}\frac{dx}{\sqrt[3]{(3-x)^5}}$.

12.5. a) $\displaystyle\int\limits_{-\infty}^{0}\frac{xdx}{\sqrt{(x^2+4)^3}}$;

б) $\displaystyle\int\limits_{1/3}^{1}\frac{\ln(3x-1)}{3x-1}dx$.

12.6. a) $\displaystyle\int\limits_{0}^{\infty}\frac{x^2dx}{\sqrt[3]{(x^3+8)^4}}$;

б) $\displaystyle\int\limits_{1/4}^{1}\frac{dx}{20x^2-9x+1}$.

12.7. a) $\displaystyle\int\limits_{0}^{\infty}\frac{xdx}{\sqrt[4]{(16+x^2)^5}}$;

б) $\displaystyle\int\limits_{1/2}^{1}\frac{\ln 2dx}{(1-x)\ln^2(1-x)}$.

12.8. a) $\displaystyle\int\limits_{4}^{\infty}\frac{xdx}{\sqrt{x^2-4x+1}}$;

б) $\displaystyle\int\limits_{0}^{2/3}\frac{\sqrt[3]{\ln(2-3x)}}{2-3x}dx$.

12.9. a) $\displaystyle\int\limits_{-1}^{\infty}\frac{dx}{\pi(x^2+4x+5)}$;

б) $\displaystyle\int\limits_{0}^{1}\frac{xdx}{1-x^4}$.

12.10. a) $\displaystyle\int\limits_{-1}^{\infty}\frac{xdx}{x^2+4x+5}$;

б) $\displaystyle\int\limits_{0}^{\pi/6}\frac{\cos 3x}{\sqrt[6]{(1-\sin 3x)^5}}dx$.

12.11. a) $\displaystyle\int\limits_{0}^{\infty}\frac{\operatorname{arctg} 2x}{\pi(1+4x^2)}dx$;

б) $\displaystyle\int\limits_{0}^{1}\frac{2xdx}{\sqrt{1-x^4}}$.

12.12. a) $\displaystyle\int\limits_{1/2}^{\infty}\frac{16dx}{\pi(4x^2+4x+5)}$;

б) $\displaystyle\int\limits_{-1/3}^{0}\frac{dx}{\sqrt[3]{1+3x}}$.

12.13. a) $\displaystyle\int\limits_{0}^{\infty}\frac{xdx}{4x^2+4x+5}$;

б) $\displaystyle\int\limits_{3/4}^{1}\frac{dx}{\sqrt[5]{3-4x}}$.

12.14. a) $\displaystyle\int\limits_{0}^{\infty}\frac{(x+2)dx}{\sqrt[3]{(x^2+4x+1)^4}}$;

б) $\displaystyle\int\limits_{0}^{\pi/2}\frac{e^{\operatorname{tg} x}}{\cos^2 x}dx$.

12.15. a) $\displaystyle\int\limits_{0}^{\infty}\frac{3-x^2}{x^2+4}dx$;

б) $\displaystyle\int\limits_{0}^{1}\frac{2e^{1-\frac{2}{\pi}\arcsin x}}{\pi\sqrt{1-x^2}}dx$.

12.16. a) $\displaystyle\int\limits_{0}^{\infty}\frac{x^2dx}{\sqrt[3]{(x^3+8)^4}}$;

б) $\displaystyle\int\limits_{1}^{2}\frac{dx}{\sqrt[5]{4x-x^2-4}}$.

12.17. a) $\displaystyle\int\limits_{0}^{\infty}\frac{xdx}{\sqrt[4]{(16+x^2)^5}}$;

б) $\displaystyle\int\limits_{\pi/2}^{\pi}\frac{\sin xdx}{\sqrt[7]{\cos^2 x}}$.

12.18. а) $\displaystyle\int\limits_{0}^{\infty}\sqrt{\frac{2}{\pi}}\,\frac{\sqrt{\operatorname{arctg}2x}}{1+4x^2}\,dx$;   б) $\displaystyle\int\limits_{-3/4}^{0}\frac{dx}{\sqrt{4x+3}}$.

12.19. а) $\displaystyle\int\limits_{1}^{\infty}\frac{4dx}{x(1+\ln^2 x)}$;   б) $\displaystyle\int\limits_{1}^{2}\frac{xdx}{\sqrt{(x^2-1)^3\ln 2}}$.

12.20. а) $\displaystyle\int\limits_{0}^{\infty}x\sin x dx$;   б) $\displaystyle\int\limits_{0}^{1/3}\frac{dx}{9x^2-9x+2}$.

12.21. а) $\displaystyle\int\limits_{-\infty}^{-1}\frac{7dx}{(x^2-4x)\ln 5}$;   б) $\displaystyle\int\limits_{0}^{\pi/2}\frac{3\sin^3 xdx}{\sqrt{\cos x}}$.

12.22. а) $\displaystyle\int\limits_{1/3}^{\infty}\frac{\pi dx}{(1+9x^2)\operatorname{arctg}^2 3x}$;   б) $\displaystyle\int\limits_{0}^{3}\frac{\sqrt[3]{9}xdx}{\sqrt[3]{9-x^2}}$.

12.23. а) $\displaystyle\int\limits_{2}^{\infty}\frac{dx}{(4+x^2)\sqrt{\pi\operatorname{arctg}\dfrac{x}{2}}}$;   б) $\displaystyle\int\limits_{0}^{1}\frac{x^4dx}{\sqrt[3]{1-x^5}}$.

12.24. а) $\displaystyle\int\limits_{1}^{\infty}\frac{dx}{(x^2+2x)\ln 3}$;   б) $\displaystyle\int\limits_{0}^{2}\frac{x^2dx}{\sqrt{64-x^6}}$.

12.25. а) $\displaystyle\int\limits_{0}^{\infty}e^{-3x}xdx$;   б) $\displaystyle\int\limits_{1/2}^{1}\frac{dx}{\sqrt[9]{1-2x}}$.

12.26. а) $\displaystyle\int\limits_{-\infty}^{0}\left(\frac{x^2}{x^3-1}-\frac{x}{1+x^2}\right)dx$;   б) $\displaystyle\int\limits_{1}^{5}\frac{x^2dx}{\sqrt{31(x^2-1)}}$.

12.27. а) $\displaystyle\int\limits_{0}^{\infty}\frac{dx}{2x^2-2x+1}$;   б) $\displaystyle\int\limits_{1}^{3/2}\frac{dx}{\sqrt{3x-x^2-2}}$.

12.28. а) $\displaystyle\int\limits_{1}^{\infty}\frac{dx}{x^2(x+1)}$;   б) $\displaystyle\int\limits_{0}^{4}\frac{10xdx}{\sqrt[4]{(16-x^2)^3}}$.

12.29. а) $\displaystyle\int\limits_{e^2}^{\infty}\frac{dx}{x(\ln x-1)^2}$;   б) $\displaystyle\int\limits_{0}^{1/4}\frac{dx}{\sqrt[3]{1-4x}}$.

12.30. а) $\displaystyle\int\limits_{1}^{\infty}\frac{10xdx}{(6x^2-5x+1)\ln\dfrac{3}{4}}$;   б) $\displaystyle\int\limits_{0}^{1/2}\frac{dx}{(2x-1)^2}$.

Завдання 13. Обчислити площу фігури, обмеженої заданими лініями.

13.1. $y = x+1, \ y = \cos x, \ y = 0$ **13.2.** $y = x^2, \ y = 3-x$.

13.3. $y = \sqrt{x}, \ y = x^3$.   **13.4.** $x = 7\cos^3 t, \ y = 7\sin^3 t$.

13.5. $x^2 = 4y, \ y = 8/(x^2+4)$ **13.6.** $xy = 6, \ x+y-7 = 0$

13.7. $y = 2^x, \ y = 2x-x^2, \ x=0, \ x=2$ **13.8.** $y^2 = (4-x^3), \ x = 0$

13.9. $y = x^3, \ y = 1, \ x = 0$ **13.10.** $y^2 = x^3, \ x = 2$

13.11. $y = x^2, \ y = 2-x^2$ **13.12.** $y^2 = 4x, \ x^2 = 4y$

13.13. $y = 1/(1+x^2), \ y = x^2/2$.   **13.14.** $y^2 = x+1, \ y^2 = 9-x$.

13.15. $y^2 = x^3, \ x = 0, \ y = 4$.

Завдання. Обчислити об'єм тіла, утвореного обертанням фігури Φ навколо вказаної осі координат.

13.16. $\Phi : y = 2x-x^2, \ y = 0, \ Ox$.

13.17. $\Phi : y^3 = x^2, \ y = 1, \ Ox$.

13.18. $\Phi : y^2 = (x-1)^3, \ x = 2, \ Ox$.

13.19. $\Phi : \dfrac{x^2}{16} + \dfrac{y^2}{1} = 1, \ Ox$.

13.20. $\Phi : x^3 = (y-1)^2, \ x = 0, \ y = 0, \ Ox$.

13.21. $\Phi : xy = 4, \ 2x+y-6 = 0, \ Ox$.

13.22. $\Phi : y^2 = 4x/3, \ x = 3, \ Ox$.

13.23. $\Phi : y = 2-x^2, \ y = x^2, \ Ox$.

13.24. $\Phi : y = -x^2+8, \ y = x^2, \ Ox$.

13.25. $\Phi : y^2 = (x+4)^3, \ x = 0, \ Ox$.

13.26. $\Phi : y = \sin x, \ y = 0, \ (0 \le x \le \pi), \ Ox$.

13.27. $\Phi : y = e^x, \ x = 0, \ y = 0, \ x = 1, \ Ox$.

13.28. $\Phi : 2y = x^2, \ 2x+2y-3 = 0, \ Ox$.

13.29. $\Phi : y = x-x^2, \ y = 0, \ Ox$.

13.30. $\Phi : y^2 = 4x, \ x^2 = 4y, \ Ox$.