## Вариант № 8

1. $\sqrt{2\sin x+3}$ 2. $-\frac{3}{2}\sqrt[3]{(\operatorname{ctg}x+1)^2}$ 3. $\ln\sqrt{x^2+2x+3}$ 4. $\frac{1}{2(\arccos x)^2}$

5. $-\cos|\ln x|$ 6. $2e^{x/2}$ 7. $\frac{1}{\sqrt{2}}\operatorname{arctg}\sqrt{2}x$ 8. $\frac{1}{\sqrt{3}}\arcsin\sqrt{\frac{3}{2}}x$

9. $\frac{1}{a}\ln|ax+\sqrt{a^2x^2+b^2}|$ 10. $\frac{1}{8}\ln(1+4x^2)-\frac{1}{6}(\operatorname{arctg}2x)^3$

11. $\frac{1}{3}e^{3x}(x-\frac{1}{3})$ 12. $-\frac{x}{5}\cos 5x+\frac{1}{25}\sin 5x$ 13. $\frac{x^4}{4}\ln|x|-\frac{x^4}{16}$

14. $\frac{1}{5}e^{2x}(2\cos x+\sin x)$ 15. $4\arcsin(2x-1)-6\sqrt{x-x^2}$

16. $\frac{3}{2}\ln(x^2+8x+17)-10\operatorname{arctg}(x+4)$ 17. $\ln\sqrt{e^{2x}+9}+\frac{1}{3}\operatorname{arctg}\frac{e^x}{3}$

18. $3\ln\left|\frac{x-1}{x+2}\right|-\frac{2}{x+2}$ 19. $\frac{1}{24}\ln\frac{(x-2)^2}{x^2+2x+4}-\frac{1}{4\sqrt{3}}\operatorname{arctg}\frac{x+1}{\sqrt{3}}$

20. $\frac{1}{2}(x+4)^2-\ln|x|+8\ln|x-1|$ 21. $-\frac{1}{2}(\sin x-1)^2$ 22. $-\frac{1}{8}\cos 4x-\frac{1}{4}\cos 2x$

23. $\frac{x}{16}-\frac{1}{64}\sin 4x+\frac{1}{48}\sin^3 2x$ 24. $\frac{1}{4}x-\frac{5}{6}\operatorname{arctg}\frac{\operatorname{tg}x/2}{\sqrt{3}}$

25. $-\operatorname{ctg}x-\frac{1}{3}\operatorname{ctg}^3x$ 26. $\frac{1}{6}\operatorname{tg}^6x$ 27. $2\sqrt{x+2}+\sqrt{2}\ln\frac{\sqrt{x+2}-\sqrt{2}}{\sqrt{x+2}+\sqrt{2}}$

28. $-\frac{\sqrt{x^2+1}}{x}-\frac{x}{\sqrt{x^2+1}}$ 29. $\frac{1}{8}(x^3+1)^{8/3}-\frac{1}{5}(x^3+1)^{5/3}$

30. $-\frac{1}{3}\cdot\frac{\sqrt{(1+x^2)^3}}{x^3}$ 31. $\ln(e^x+\sqrt{e^{2x}+1})$

32. $x\cdot\arcsin^2x+2\arcsin x\cdot\sqrt{1-x^2}-2x$

33. $\sqrt{x^4+x^2+1}$ 34. $\frac{1}{10}[\ln|\operatorname{tg}x|-\ln|3\operatorname{tg}x+5|]$

35. $e^{-1/x}$ 36. $-\frac{e^x}{x}$ 37. $2\sqrt{\operatorname{tg}x}$

38. $(x^2-x)e^x-(2x-1)e^x+2e^x$

39. $\frac{1}{60}\ln|x^5-2|-\frac{1}{120}\ln(x^{10}+2x^5+4)-\frac{1}{20\sqrt{3}}\operatorname{arctg}\frac{x^5+1}{\sqrt{3}}$

40. $\frac{1}{2}\ln(x^2+\frac{1}{2}+\sqrt{x^4+x^2+1})$



## Вариант № 9

1. $-\frac{1}{6\sin^3 2x}$ 2. $\ln\sqrt{3+2\operatorname{tg}x}$ 3. $2\sin\sqrt{x}$ 4. $\cos\frac{1}{x}$ 5. $\frac{3^{x^2}}{2\ln 3}$

6. $\frac{1}{\ln a}\operatorname{arctg}a^x$ 7. $\frac{1}{\sqrt{3}}\ln|\sqrt{3}x+\sqrt{2+3x}|$ 8. $\frac{1}{5}\arcsin x^5$

9. $\frac{2}{3}\sqrt{1+x^3}$ 10. $-e^{\operatorname{ctg}x}$ 11. $\frac{x}{3}\sin 3x+\frac{1}{9}\cos 3x$

12. $\frac{1}{2}(1+x^2)\operatorname{arctg}x-\frac{x}{2}$ 13. $-\frac{\ln x}{2x^2}-\frac{1}{4x^2}$ 14. $\frac{x}{2}[\cos(\ln x)+\sin(\ln x)]$

15. $5\sqrt{x^2+2x+5}-\ln|x+1+\sqrt{x^2+2x+5}|$ 16. $\ln\sqrt{x^2-2x+2}+$
$+4\operatorname{arctg}(x-1)$ 17. $e^x+\ln(e^x-1)$ 18. $\frac{4}{x-1}-9\ln\left|\frac{x-1}{x+2}\right|$

19. $-3\ln|x|+\frac{3}{2}\ln(x^2-2x+5)+2\operatorname{arctg}\frac{x-1}{2}$

20. $\frac{x^2}{2}-x-\frac{1}{x}+\ln\frac{(x+1)^2}{|x|}$ 21. $x-\operatorname{tg}\frac{x}{2}$

22. $\frac{x}{16}-\frac{1}{64}\sin 4x+\frac{1}{48}\sin^3 2x$ 23. а) $\frac{1}{4}\sin^4x-\frac{1}{6}\sin^6x$
б) $\frac{1}{16}(\frac{1}{3}\cos^3 2x-\cos 2x)$ в) $-\frac{1}{4}\cos^4x+\frac{1}{6}\cos^6x$

24. а) $-\frac{1}{4}\operatorname{ctg}^4x+\frac{1}{2}\operatorname{ctg}^2x+\ln|\sin x|$ б) $-\frac{1}{4\sin^4x}+\frac{1}{\sin^2x}+\ln|\sin x|$

25. $-x+\sqrt{2}\operatorname{arctg}\frac{\operatorname{tg}x}{\sqrt{2}}$ 26. $\frac{1}{4}\sin 2x-\frac{1}{16}\sin 8x$

27. $2\sqrt{x}-3\sqrt[3]{x}+6\sqrt[6]{x}-6\ln|1+\sqrt[6]{x}|$

28. а) $\operatorname{arctg}\sqrt{x^2-1}$, б) $-\arcsin\frac{1}{x}$, в) $\arccos\frac{1}{x}$

29. $-\frac{1}{4}\left(\frac{2-x^3}{x^3}\right)^{2/3}$ 30. $-4\sqrt{4-x^2}+\frac{1}{3}(4-x^2)^{3/2}$

31. $\arcsin\frac{x+1}{\sqrt{2}}$ 32. $3e^{\sqrt[3]{x}}(x^{2/3}-2x^{1/3}-2)$ 33. $\operatorname{tg}x+\frac{1}{3}\operatorname{tg}^3x$

34. $\ln(e^x+1)-e^{-x}-x$ 35. $\frac{1}{2}(x\sqrt{x^2+1}-\ln|x+\sqrt{x^2+1}|)$

36. „неберущийся" 37. $e^{-\cos x}$ 38. $\frac{1}{35}(1+e^{5x})^7$

39. $\frac{1}{8}\operatorname{tg}^2\frac{x}{2}+\frac{1}{2}\ln|\operatorname{tg}\frac{x}{2}|-\frac{1}{8}\operatorname{ctg}^2\frac{x}{2}-\frac{1}{\sin^2 x}$

40. $-\frac{1}{5\sqrt{2}}\operatorname{arctg}\frac{x}{\sqrt{2}}+\frac{1}{10\sqrt{3}}\ln\left|\frac{x-\sqrt{3}}{x+\sqrt{3}}\right|$

## Вариант № 10

1. $\frac{1}{3}\sqrt{(2tgx+1)^3}$ 2. $\frac{1}{10}(x^2+1)^5$ 3. $\frac{1}{4}\ln^2(2x+1)$ 4. $\frac{1}{5}\frac{a^{x^5}}{\ln a}$

5. $\frac{1}{3}e^{\sin 3x}$ 6. $-\sin\frac{1}{x}$ 7. $-2\ln|\cos\sqrt{x-1}|$ 8. $\ln(e^x+\sqrt{e^{2x}-1})$

9. $\arcsin e^x$ 10. $\frac{1}{3}(arctg\,2x)^{3/2}$ 11. $-\frac{x}{5}\cos 5x+\frac{1}{25}\sin 5x$

12. $x\cdot\arccos x-\sqrt{1-x^2}$ 13. $\frac{1}{2}e^{2x}(x-\frac{1}{2})$ 14. $\frac{1}{5}e^x(\sin 2x-2\cos 2x)$

15. $\sqrt{x^2+4x+6}-4\ln|x+2+\sqrt{x^2+4x+6}|$ 16. $\ln\sqrt{x^2+x+1}-$ $\sqrt{3}\,arctg\frac{2x+1}{\sqrt{3}}$ 17. $\frac{1}{4}\ln(e^{4x}+1)$ 18. $-\frac{1}{x^2}+\frac{1}{2x}-\frac{\ln|x|}{4}+\frac{\ln|x-2|}{4}$

19. $\ln|x|-\frac{1}{2}\ln(x^2+2x+2)$ 20. $\frac{x^2}{2}-2x+2\ln(x^2+2x+2)-\frac{2}{x}-$ $-2arctg(x+1)$ 21. $\frac{1}{8}\cos 4x-\frac{1}{20}\cos 10x$ 22. $\frac{1}{8}x-\frac{1}{32}\sin 4x$

23. $7x+14\sin x+3\sin 2x-\frac{8}{3}\sin^3 x$ 24. $\frac{1}{\cos x}+\cos x$

25. $\frac{1}{3}tg^3x+tgx$ 26. $\frac{x}{2}-\ln|\cos\frac{x}{2}|$ 27. $2\arcsin\frac{x}{2}+$ $+\frac{x}{2}\sqrt{4-x^2}$ 28. $\frac{1}{3}\frac{x^3}{\sqrt{(x^2+1)^3}}$ 29. $4\ln(\sqrt{x}+4)+2arctg\frac{\sqrt[4]{x}}{2}$

30. $\frac{2}{3}(2+x^{2/3})^{9/4}-\frac{12}{5}(2+x^{2/3})^{5/4}$ 31. $\frac{1}{4}\cdot\frac{1}{(\cos x+\sin x)^4}$

32. $\frac{(1-x)^{102}}{102}-\frac{(1-x)^{101}}{101}$ 33. $x\ln^2 x-2x\ln x+2x$

34. „неберущийся" 35. $-\frac{1}{x\ln x}$ 36. $\frac{1}{8}\ln\left|\frac{x^4-1}{x^4+1}\right|$

37. $\frac{1}{2}\ln(x^2+1)$ 38. $\frac{1}{\sqrt{3}}arctg\sqrt{3}\,tg\,x$

39. $\frac{x}{\sqrt{1+x^2}}$ 40. $\ln\left|\frac{\sqrt{1+e^x}-1}{\sqrt{1+e^x}+1}\right|$



## Вариант № 11

1. $-\frac{2}{3b}\sqrt{(a-bx)^3}$ 2. $-\frac{1}{3\ln 4}4^{2-3x}$ 3. $\frac{3}{5}\sqrt{5x^2+1}+\frac{1}{\sqrt{5}}\ln|\sqrt{5}x+\sqrt{5x^2+1}|$

4. $2\ln|\sin\frac{x}{2}|$ 5. $3\sin\sqrt[3]{x}$ 6. $\frac{1}{5}tg\,5x-x$ 7. $\arcsin\frac{e^x}{2}$

8. $-\frac{1}{2}\ln|4-\sin 2x|$ 9. $-\frac{1}{2\ln^3 x}$ 10. $\frac{1}{12}\ln\left|\frac{3x-2}{3x+2}\right|$

11. $-\frac{2^{-x}}{\ln 2}(x+\frac{1}{\ln 2})$ 12. $\frac{x}{3}\sin 3x+\frac{1}{9}\cos 3x$ 13. $x\,arctg\,x-$ $-\ln\sqrt{1+x^2}$ 14. $\frac{1}{2}e^x(\sin x-\cos x)$ 15. $\sqrt{x^2+3x+3}+$ $+\frac{5}{2}\ln|x+\frac{3}{2}+\sqrt{x^2+3x+3}|$ 16. $\frac{3}{2}\ln(x^2+x+1)-\frac{5}{\sqrt{3}}arctg\frac{2x+1}{\sqrt{3}}$

17. $\frac{3}{5}(e^x+1)^{5/3}-\frac{3}{2}(e^x+1)^{2/3}$ 18. $-\frac{9}{2(x-3)}-\frac{1}{2(x+1)}$

19. $\ln(x^2+2x+5)-2\ln|x+2|+\frac{1}{2}arctg\frac{x+1}{2}$

20. $\frac{1}{4}x^4+\frac{1}{4}\ln(x^4-1)$ 21. а) $-\frac{1}{2}ctg^2x+\ln\sqrt{1+ctg^2x}$

б) $-\frac{1}{2\sin^2 x}-\ln|\sin x|$ 22. $-\frac{1}{4}\cos 2x-\frac{1}{12}\cos 6x$

23. $\sin x-\frac{2}{3}\sin^3 x+\frac{1}{5}\sin^5 x$ 24. $\frac{3}{8}x-\frac{1}{12}\sin 6x+\frac{1}{96}\sin 12x$

25. $\ln|tg\,x|-\frac{1}{2}ctg^2x$ 26. $\frac{1}{2}\ln|tg\frac{x}{2}|+\frac{1}{2}\ln\left|\frac{1+tg\,x/2}{1-tg\,x/2}\right|$

27. $arctg\frac{\sqrt{9-x^2}}{x}-\frac{\sqrt{9-x^2}}{x}$ 28. $\ln|x|-6\ln(1+\sqrt[6]{x})$

29. $\frac{1}{4}\ln\left|\frac{\sqrt[4]{1+x^4}+x}{\sqrt[4]{1+x^4}-x}\right|-\frac{1}{2}arctg\frac{\sqrt[4]{1+x^4}}{x}$ 30. $\ln\left|\frac{\sqrt{x+1}-1}{\sqrt{x+1}+1}\right|$

31. $-\frac{\sin x}{x}$ 32. $tg\,x\cdot\ln|\cos x|+tg\,x-x$ 33. $-\frac{\sqrt{4+x^2}}{4x}$

34. $\frac{1}{\sin x-x}$ 35. $\frac{1}{3}\ln|x^3+1|$ 36. $-\frac{1}{3}\ln|x+1|+\frac{1}{6}\ln(x^2-x+1)+$ $+\frac{1}{\sqrt{3}}arctg\frac{2x-1}{\sqrt{3}}$ 37. $\frac{1}{2}\ln^2|x+\sqrt{1+x^2}|$. 38. „неберущийся"

39. $\frac{1}{2}tg^2x$ 40. $\cos\frac{1}{x}$

## Вариант № I2

1. $\frac{4}{5}\sqrt[4]{(1+\ln x)^5}$ 2. $-\frac{1}{4\sin^2 2x}$ 3. $-\frac{1}{3}\ln|2+\operatorname{ctg}3x|$ 4. $\ln|\ln x+\sqrt{1+\ln^2 x}|$

5. $\frac{1}{3}\operatorname{tg}3x-x$ 6. $-\frac{3}{4}\sqrt{1-4x^2}-\frac{1}{2}\arcsin 2x$ 7. $\frac{1}{4}\ln(1+4x^2)+\frac{3}{2}\operatorname{arctg}2x$

8. $\frac{1}{6}e^{2x}$ 9. $\frac{1}{3}\sin(x^3+1)$ 10. $\frac{1}{24}\ln\left|\frac{3x-4}{3x+4}\right|$ 11. $\frac{e^{5x}}{25}(5x-1)$

12. $-\frac{1}{3}x^2\cos 3x+\frac{2}{9}x\sin 3x+\frac{2}{27}\cos 3x$ 13. $-\frac{1}{x}(\ln x+1)$

14. $\frac{1}{17}e^x(4\sin 4x+\cos 4x)$ 15. $\frac{3}{2}\ln(x^2+2x+3)-\sqrt{2}\operatorname{arctg}\frac{x+1}{\sqrt{2}}$

16. $\frac{1}{3}\ln|3x+1+\sqrt{9x^2-6x+2}|$ 17. $\frac{4}{7}\sqrt[4]{(1+e^x)^7}-\frac{4}{3}\sqrt{(1+e^x)^3}$

18. $-\frac{1}{2x}+\frac{1}{4}\ln|x|-\frac{1}{8}\ln(x^2+4)-\frac{1}{4}\operatorname{arctg}\frac{x}{2}$

19. $x-\frac{1}{3}\ln|x+1|+\frac{1}{6}\ln(x^2-x+1)-\frac{1}{\sqrt{3}}\operatorname{arctg}\frac{2x-1}{\sqrt{3}}$

20. $2x-\ln|x|+\ln(x^2+3x+3)-\frac{4}{\sqrt{3}}\operatorname{arctg}\frac{2x+3}{\sqrt{3}}$

21. $\frac{1}{5}\sin^5 x-\frac{1}{7}\sin^7 x$ 22. $3\sin\frac{x}{6}-\frac{3}{5}\sin\frac{5}{6}x$

23. $\frac{1}{2\sqrt{3}}\operatorname{arctg}\frac{2\operatorname{tg}x}{\sqrt{3}}$ 24. $\ln\left|\frac{\operatorname{tg}x/2-5}{\operatorname{tg}x/2-3}\right|$

25. $\frac{1}{6}\operatorname{tg}^3 2x-\frac{1}{2}\operatorname{tg}2x+x$ 26. $\frac{3}{128}x-\frac{\sin 2x}{64}+\frac{\sin 4x}{512}$

27. $-\frac{\sqrt{x^2+9}}{x}+\ln|x+\sqrt{x^2+9}|$ 28. $3\sqrt[3]{x+1}+6\sqrt[6]{x+1}+6\ln|\sqrt[6]{x+1}-1|$

29. $\frac{\sqrt{1+x^2}}{x}-\frac{\sqrt{1+x^2}}{3x^3}$ 30. $\frac{2}{9}(1+x^2)^{9/4}-\frac{2}{5}(1+x^2)^{5/4}$

31. $\arcsin 2x\left(\frac{x^2}{2}-\frac{1}{16}\right)+\frac{1}{8}x\sqrt{1-4x^2}$ 32. $-5\sqrt{3-2x-x^2}-6\arcsin\frac{x+1}{2}$

33. $\sqrt{x^2-16}-4\operatorname{arctg}\frac{\sqrt{x^2-16}}{4}$ 34. $\frac{1}{32}\ln\left|\frac{x-2}{x+2}\right|-\frac{1}{16}\operatorname{arctg}\frac{x}{2}$

35. $\frac{1}{16}\ln\left|\frac{x^2-4}{x^2+4}\right|$ 36. $-\sin\frac{1}{x}$ 37. $-\frac{\cos x}{x}$

38. $2\sqrt{1+x}\arcsin x+4\sqrt{1-x}$ 39. $\frac{x}{2}+\frac{1}{12}\sin 6x$ 40. $\frac{\sin^4 x}{4}$



## Вариант № I3

1. $-\frac{1}{18}\cdot\frac{1}{(3+2x^3)^3}$ 2. $\frac{1}{6}\ln(2e^{3x}+9)$ 3. $a(e^{x/a}-e^{-x/a})$ 4. $-\operatorname{tg}(1-x)$

5. $\sin^3\frac{x}{3}$ 6. $-\frac{1}{3}\cos x^3$ 7. $\frac{1}{3}\arcsin\frac{3x}{5}$ 8. $\frac{1}{12}\operatorname{arctg}\frac{3x}{4}$

9. $-\ln|\cos x+\sqrt{\cos^2 x+4}|$ 10. $\frac{1}{4}\ln\left|\frac{2x-1}{2x+1}\right|$ 11. $-\frac{x^2}{5}\cos 5x+$
$+\frac{2x}{25}\sin 5x+\frac{2}{125}\cos 5x$ 12. $\frac{3^x}{\ln 3}\left(x-\frac{1}{\ln 3}\right)$ 13. $x-\sqrt{1-x^2}\arcsin x$

14. $\frac{1}{13}e^{2x}(3\sin 3x+2\cos 3x)$ 15. $\ln\sqrt{x^2+4x+5}-2\operatorname{arctg}(x+2)$

16. $\arcsin\frac{x-1}{\sqrt{6}}$ 17. $2\sqrt{e^x-1}-4\operatorname{arctg}\frac{\sqrt{e^x-1}}{2}$

18. $\frac{1}{x-1}+2\ln\left|\frac{x-2}{x-1}\right|$ 19. $\frac{1}{5}\ln|x+2|+\frac{2}{5}\operatorname{arctg}x-\frac{1}{10}\ln(x^2+1)$

20. $\frac{x^2}{2}+x+\ln|x-1|-\frac{1}{2}\ln(x^2+1)-\operatorname{arctg}x$ 21. $-\frac{1}{8}\cos^4 2x$

22. $\frac{3}{8}x-\frac{1}{12}\sin 6x+\frac{1}{96}\sin 12x$ 23. $\ln|\operatorname{tg}x|+\frac{1}{2}\operatorname{tg}^2 x$

24. $\frac{1}{4}\sin 2x-\frac{1}{8}\sin 4x$ 25. $\frac{1}{16}x-\frac{1}{64}\sin 4x+\frac{1}{48}\sin^3 2x$

26. $\frac{1}{2}\operatorname{arctg}\left(2\operatorname{tg}\frac{x}{2}\right)$ 27. $\frac{1}{4}\frac{x}{\sqrt{4-x^2}}$ 28. $\frac{3}{2}x^{2/3}+2x^{1/2}+$
$+3x^{1/3}+6x^{1/6}+6\ln(\sqrt[6]{x}-1)$ 29. $\frac{2}{9}(x^2+1)^{9/4}-\frac{2}{5}(x^2+1)^{5/4}$

30. $\frac{1}{6}\ln\left|\frac{\sqrt{9-x^2}-3}{\sqrt{9-x^2}+3}\right|$ 31. $3\sqrt{x^2-6x+10}+14\ln|x-3+\sqrt{x^2-6x+10}|$

32. $-2\sqrt{1-x}\ln|x|+4\sqrt{1-x}+2\ln\left|\frac{\sqrt{1-x}-1}{\sqrt{1-x}+1}\right|$

33. $\frac{x}{16\sqrt{x^2+16}}$ 34. $-8\operatorname{ctg}2x-\frac{8}{3}\operatorname{ctg}^3 2x$

35. $\frac{1}{4}\sin 2x-\frac{1}{4}\ln\left|\frac{\operatorname{tg}x-1}{\operatorname{tg}x+1}\right|$ 36. $\ln\sqrt[4]{1+x^4}+\frac{1}{4(1+x^4)}$

37. $\operatorname{arctg}e^x$ 38. $\frac{-1}{3(3\cos x-1)}$ 39. „неберущийся"

40. $-\frac{1}{\ln x}$

## Вариант № I4

1. $\frac{1}{18}(3x+2)^6$ 2. $\frac{1}{24}\ln|8x^3+1|$ 3. $\frac{1}{2}e^{x^2-2x}$ 4. $-\sin(\cos x)$

5. $\sqrt{1+\sin 2x}$ 6. $\frac{1}{2}tg\,2x+2\ln|\cos x|$ 7. $\frac{1}{3}\ln|3x+\sqrt{1+9x^2}|$

8. $ctg(1-x)$ 9. $\frac{1}{6}arctg\frac{e^{3x}}{2}$ 10. $\arcsin\frac{\ln x}{3}$

11. $\sin x(\ln\sin x-1)$ 12. $(\frac{x^2}{2}+\frac{1}{18})arctg\,3x-\frac{x}{6}$ 13. $2e^{\cos x}(1-\cos x)$

14. $\frac{1}{13}e^{2x}(2\sin 3x-3\cos 3x)$ 15. $\ln\sqrt{x^2+2x+5}+\frac{2}{\sqrt{5}}arctg\frac{x+1}{\sqrt{5}}$

16. $\frac{1}{4}(\sqrt{4x^2-4x+5}+\ln|2x-1+\sqrt{4x^2-4x+5}|)$ 17. $2(\sqrt{e^x+1}-arctg\sqrt{e^x+1})$

18. $x+\ln\sqrt[4]{\frac{x^8+2}{x}}-\frac{2}{\sqrt{2}}arctg\frac{x}{\sqrt{2}}$ 19. $\ln\left|\frac{x-1}{x+2}\right|-\frac{1}{(x+2)^2}+\frac{3}{x+2}$

20. $\frac{1}{54}\ln\frac{(x+3)^2}{x^2-3x+9}+\frac{1}{9\sqrt{3}}arctg\frac{2x-3}{3\sqrt{3}}$ 21. $\sin x-\frac{2}{3}\sin^3 x+\frac{1}{5}\sin^5 x$

22. $\frac{2}{\sqrt{2}}arctg\frac{tg\,x/2+1}{\sqrt{2}}$ 23. $\frac{1}{2}(\frac{1}{3}\sin 3x+\frac{1}{7}\sin 7x)$

24. $\frac{1}{2}arctg(tg\,x\sqrt{2})$ 25. а) $-\frac{1}{6}\frac{1}{\sin^2(3x+2)}-\frac{1}{3}\ln|\sin(3x+2)|$

б) $-\frac{1}{6}ctg^2(3x+2)-\ln\sqrt{1+ctg^2(3x+2)}$ 26. а) $\frac{1}{16}(x-\frac{1}{3tg^3x}-\frac{2}{tg\,x})$

б) $-\frac{1}{6tg^3 2x}-\frac{1}{2tg\,2x}$ 27. $\ln x^2-3x-\ln\left|\frac{\sqrt{x+1}-1}{\sqrt{x+1}+1}\right|$

28. $-\frac{1}{80}\cdot\frac{\sqrt{16-x^2}}{x^2}$ 29. $3\sqrt[3]{(9+x^2)^3}-\frac{\sqrt{(9+x^2)^5}}{5}$ 30. $\frac{5}{8}(x^{8/5}-1)$

31. $\frac{1}{3}tg^3x-tg\,x+x$ 32. $\frac{1}{4}(\cos x-\frac{3}{4}\ln\left|\frac{2\cos x-1}{2\cos x+1}\right|)$

33. $\frac{1}{10}\ln\left|\frac{2e^{2x}+3}{2e^{2x}-3}\right|$ 34. $\frac{x}{\sqrt[6]{1+x^6}}$ 35. $\frac{1}{4}arctg\,x^4$

36. $\frac{x^3}{3}-\ln\sqrt{x^3+1}$ 37. $2(\sqrt{x}-\sqrt{2}\,arctg\sqrt{\frac{x}{2}})$

38. $-\arcsin\frac{1}{x}$ 39. $x(\ln|x^2-1|-2)-\ln\left|\frac{x-1}{x+1}\right|$ 40. $\sin(\ln x)$



## Вариант № I5

1. $\frac{1}{18}(3e^x+2)^6$ 2. $2\sqrt{x^6+x^4+1}$ 3. $-\frac{1}{2}\ln\cos(x^2)$ 4. $-\frac{1}{3}\frac{4^{2-3x}}{\ln 4}$

5. $\frac{1}{3}\arcsin\frac{3x}{2}$ 6. $-\ln|\ln(\cos x)|$ 7. $\frac{1}{4}\ln(x^4+\sqrt{1+x^8})$ 8. $arctg(\ln x)$

9. $-\frac{1}{3}ctg(x^3)$ 10. $\frac{1}{8}\sin^4 2x$ 11. $(\frac{x^4}{4}+x)\ln x+\frac{x^4}{16}+x$

12. $\frac{1}{2}e^{x^2}(x^2-1)$ 13. $\frac{1}{2}(x^2\arcsin(x^2)+\sqrt{1-x^4})$

14. $\frac{1}{25}e^{3x}(4\sin 4x+3\cos 4x)$ 15. $-\sqrt{6-x-x^2}-\frac{1}{2}\arcsin\frac{2x+1}{5}$

16. $\frac{3}{2}\ln(x^2+2x+2)-7arctg(x+1)$ 17. $\frac{5}{8}\ln(e^{2x}+4)-\frac{x}{4}$

18. $\ln(1+\frac{1}{x^2})+arctg\,x$ 19. $x+\frac{1}{3}arctg\,x-\frac{8}{3}arctg\frac{x}{2}$

20. $\ln\sqrt[4]{(x+2)^3(x-2)}+\frac{1}{x+2}$ 21. $\frac{1}{\sqrt{5}}\ln\left|\frac{tg\frac{x}{2}+\sqrt{5}}{tg\frac{x}{2}-\sqrt{5}}\right|$

22. $\sin x-\frac{1}{3}\sin^3 x$ 23. $x+\frac{1}{2}ctg\,2x-\frac{1}{6}ctg^3 2x$

24. $\frac{1}{8}(\frac{15}{32}\sin 2x+\frac{1}{48}\sin^3 2x-\frac{1}{8}\sin 4x)$ 25. $\ln\sqrt{1+2tg\,x}$

26. $\frac{1}{8}\cos 4x-\frac{1}{20}\cos 10x$ 27. $12\left[\frac{\sqrt[6]{x^5}}{10}-\frac{\sqrt[12]{x^5}}{10}+\frac{1}{5}\ln|\sqrt[12]{x^5}+1|\right]$

28. $2arctg\sqrt{x-1}$ 29. $\frac{1}{12}\cdot\frac{x^3}{\sqrt{(4+x^2)^3}}$ 30. $\frac{\sqrt[3]{(1+\sqrt{x^3})^4}}{2}$

31. $\frac{1}{2}e^{x^2}$ 32. $\frac{9}{2}(\arcsin\frac{x}{3}+x\sqrt{9-x^2})$ 33. $\frac{3}{40}\sqrt[3]{(2x+1)^2}(12x-1)$

34. $\frac{1}{4}\sin^4 x-\frac{1}{3}\sin^6 x+\frac{1}{8}\sin^8 x$ 35. $\frac{x}{7}\sqrt[4]{(e^x-1)^3}(e^x-\frac{4}{3})$

36. $\frac{1}{4}\sin x-\frac{1}{8}arctg(2\sin x)$ 37. $-\ln|\cos x+\sqrt{9-\cos^2 x}|$

38. $\frac{1}{4}(\frac{3}{2}x-4\sin x+\frac{1}{4}\sin 2x)$ 39. „неберущийся"

40. $-\frac{1}{2}(\frac{x}{\sin^2 x}+ctg\,x)$

## Вариант № I6

1 $\frac{2}{3}\sqrt{\arcsin^3 x}$ 2 $\frac{2^{x^2-1}}{\ln 2}$ 3. $e^{\operatorname{arctg} x}$ 4 $\operatorname{arctg} e^x$

5. $\ln\left(\sin^2 x+\sqrt{2+\sin^4 x}\right)$ 6 $e^{-1/x}$ 7. $-2\ln|\cos x|$ 8 $\ln\sqrt{\sin(x^2+1)}$

9. $\ln|e^x-1|$ 10 $\frac{1}{6}\ln^2(x^3+1)$ 11 $\frac{1}{8}\sin 2x-\frac{1}{4}x\cos 2x$

12 $-e^{-x}(x+1)$ 13. $x\cdot\arcsin x+\sqrt{1-x^2}$ 14 $-\frac{1}{10}e^{-x}(5+2\sin 2x-$
$-\cos 2x)$ 15. $\frac{3}{2}\ln(x^2+2x+2)+2\operatorname{arctg}(x+1)$ 16. $-8\sqrt{5+2x-x^2}-$
$-3\arcsin\frac{x-1}{\sqrt{6}}$ 17 $\frac{5}{9}(e^x-1)^{9/5}+\frac{5}{4}(e^x-1)^{4/5}$ 18 $\frac{1}{6}\ln\frac{(x+1)^2}{x^2-x+1}+$
$+\frac{1}{\sqrt{3}}\operatorname{arctg}\frac{2x-1}{\sqrt{3}}$ 19. $-\frac{1}{2(x+1)}-\frac{9}{2(x-3)}$ 20. $\frac{x^2}{2}+x+\ln\frac{x-1}{\sqrt{x^2+1}}-$
$-\operatorname{arctg} x$ 21. $-\frac{1}{3\operatorname{tg}^3 x}-\frac{1}{\operatorname{tg} x}$ 22. $\frac{3}{16}\cos^{16/3}x+\frac{3}{5}\cos^{10/3}x-\frac{3}{4}\cos^{4/3}x$

23. а) $\frac{2}{\operatorname{tg}\frac{x}{2}-1}-2\operatorname{arctg}\left(\operatorname{tg}\frac{x}{2}\right)$ б) $\frac{1}{\cos x}+\operatorname{tg} x-x$

24. $\ln\frac{1}{\cos x}-\ln|1-\operatorname{tg} x|=-\ln|\cos x-\sin x|$

25. $\frac{1}{2}\left[x\cos\omega_0-\frac{1}{2\omega}\sin(2\omega x+\omega_0)\right]$ 26 $\frac{1}{32}(12x+8\sin 2x+\sin 4x)$

27. $2\sqrt{x}-3\sqrt[3]{x}+6(1-\ln|\sqrt[6]{x}+1|)$ 28. „неберущийся"

29. $-\frac{\sqrt{1-x^2}}{x}-\arcsin x$ 30. $-\frac{1}{4}\left[\sqrt{x^2-1}-\ln\left|\frac{\sqrt{x+1}-1}{\sqrt{x+1}+1}\right|\right]$

31. $3\left(\frac{\sqrt{2x}}{3}-\frac{\sqrt[6]{(2x)^5}}{5}\right)$ 32. $-\frac{x}{2}+\ln\sqrt[3]{e^x-1}+\ln\sqrt[6]{e^x+2}$

33. $\ln\left|\sqrt{x+1}-1\right|-\frac{2}{\sqrt{3}}\operatorname{arctg}\frac{2\sqrt{x+1}+1}{\sqrt{3}}$ 34. $\ln\left|\operatorname{tg}\frac{x}{2}\right|$

35. $x\operatorname{tg} x+\ln|\cos x|$ 36. $\arcsin\frac{\ln x}{\sqrt{3}}-\sqrt{3-\ln^2 x}$

37. $\frac{1}{12}\left(x^4-\frac{2}{3}\sqrt{1+3x^4}\right)$ 38. $\frac{1}{\cos x}+2\cos x-\frac{1}{3}\cos^3 x$

39. $\operatorname{tg} x$ 40. $\frac{1}{4}(1-x)^2-\frac{\sqrt{3}}{8}\sin 2\frac{(1-x)^2}{\sqrt{3}}$



## Вариант № I7

1. $\frac{3}{4}\sqrt[3]{(1+\ln x)^4}$ 2. $-\frac{1}{2}e^{-x^2}$ 3. $-\frac{2}{\sqrt{e^x}}$ 4. $\frac{a^{\sin x}}{\ln a}$ 5 $-\frac{1}{a}\operatorname{ctg} ax-x$

6. $-2\ln|\cos\sqrt{x-1}|$ 7. $-\frac{1}{2}\cdot\frac{10^{1-x^2}}{\ln 10}$ 8. $\left(\ln\sqrt{\frac{2^x+1}{2^x-1}}\right)\cdot\frac{1}{\ln 2}$

9. $\frac{1}{\sqrt{a^2-b^2}}\operatorname{arctg}\sqrt{\frac{a-b}{a+b}}x$ 10. $\frac{3}{4}\operatorname{tg}^4\frac{x}{3}$ 11. $-\frac{1}{8}x^2\cos 3x+\frac{2}{9}x\sin 3x+$
$+\frac{2}{27}\cos 3x$ 12. $\frac{x}{2}\operatorname{tg} 2x+\ln\sqrt[4]{\cos 2x}-\frac{x^2}{2}$ 13. $2e^{\sqrt{x}}(\sqrt{x}-1)$

14. $\frac{4}{5}e^{-x}\left(-\sin\frac{x}{2}-\frac{1}{2}\cos\frac{x}{2}\right)$ 15. $x+3\ln(x^2-6x+10)+8\operatorname{arctg}(x-3)$

16 $-2\sqrt{1-x-x^2}-9\arcsin\frac{2x+1}{\sqrt{5}}$ 17 $e^{-x}-x+\ln|e^x-1|$

18. $\ln\left|\frac{x}{x+1}\right|+\frac{1}{x+1}$ 19. $x-\frac{1}{2}\operatorname{arctg} x+\ln\sqrt[4]{\frac{x-1}{x+1}}$

20. $4\ln|x-1|-7\ln|x+3|+5\ln|x-4|$ 21. $-\frac{1}{\sqrt{2}}\ln\left|\frac{\operatorname{tg}\frac{x}{2}-1-\sqrt{2}}{\operatorname{tg}\frac{x}{2}-1+\sqrt{2}}\right|$

22. $\frac{1}{2}\operatorname{arctg}\frac{\operatorname{tg} x}{2}$ 23. $\frac{1}{50}(5\sin 5x-\sin 2{,}5x)$

24. $\frac{1}{4}\left(\frac{3}{2}x-2\sin x+\frac{1}{4}\sin 2x\right)$ 25. $\cos^2 x-\frac{1}{4}\cos^4 x-\ln|\cos x|$

26. $\sin x-\frac{2}{3}\sin^3 x+\frac{1}{5}\sin^5 x$ 27. $\ln\sqrt[4]{\frac{\sqrt{1+x^2}+x}{\sqrt{1+x^2}-x}}+\frac{1}{2}x\sqrt{1+x^2}$

28. $\ln|1-2\sqrt{x}|+\frac{1}{2\sqrt{x}-1}-\sqrt{x}$ 29 $\frac{3}{2}\sqrt[3]{x^2}-\frac{12}{7}\sqrt[12]{x^7}+2\sqrt{x}-\frac{12}{5}\sqrt[12]{x^5}+$
$+3\sqrt[3]{x}-4\sqrt[4]{x}+6\sqrt[6]{x}+12\ln|1+\sqrt[12]{x}|-12\sqrt[12]{x}$ 30. $\frac{1}{4}\left(\sqrt{1+2x^2}+\frac{1}{\sqrt{1+2x^2}}\right)$

31. $\ln|\cos x|+\ln\left|\frac{\operatorname{tg}\frac{x}{2}+1}{\operatorname{tg}\frac{x}{2}-1}\right|$ 32. $\frac{x}{2}\sqrt{a^2+x^2}+\frac{a^2}{2}\ln|x+\sqrt{a^2+x^2}|$

33. $\frac{x^2}{4}-\frac{1}{8}\sin 2x^2$ 34. „неберущийся" 35. $\frac{1}{a^2}\left[\frac{3}{5}\sqrt[3]{(ax+b)^5}-\right.$
$\left.-\frac{3}{2}b\sqrt[3]{(ax+b)^2}\right]$ 36. $2\left(\sqrt{e^x+1}+\ln\sqrt{\frac{\sqrt{e^x+1}-1}{\sqrt{e^x+1}+1}}\right)$ 37. $2\sqrt{\operatorname{tg} x}+$
$+\frac{4}{5}\sqrt{\operatorname{tg}^5 x}+\frac{1}{5}\operatorname{tg}^5 x$ 38. $\ln\left|e^x+\frac{1}{2}+\sqrt{1+e^x+e^{2x}}\right|$

39. $-\frac{1}{4}\cdot\frac{\sqrt{4-x^2}}{x}$ 40. $5x+\ln\sqrt{x}-\frac{7}{3}\ln|x-1|+\frac{161}{6}\ln|x-4|$