

(2-SEMESTR UCHUN AMALAIY MASHG'ULOTLAR)

2- AMALIY MASHG'ULOT

Mavzu: Qurilish masalalarini ob`ektga yo`naltirilgan dasturlash tillaridan foydalanib yechish
(2 soat)

C++ dasturlash tilida yozing

1. $e^{a^2b} - \frac{1}{5}a^2b^2c$ ni C++ dasturlash tilida yozing.
2. $\ln(x) + \ln(a)$ ni C++ dasturlash tilida yozing.
3. $\frac{a^8(b^4)^4}{a\frac{1}{b^3} - (ab)^2}$ ni C++ dasturlash tilida yozing.
4. $\left(-\frac{7}{15}a^3b^2c^3\right) \cdot \left(\frac{9}{14}ab^2c\right)$ ni C++ dasturlash tilida yozing.
5. $\frac{1}{18} \cdot x \cdot (-0.9) \cdot y^2$ ni C++ dasturlash tilida yozing.
6. $e^{ba^2} - \sin(\pi x + a)$ ni C++ dasturlash tilida yozing.
7. $\sin^2(x) + \cos^2(x)$ ni C++ dasturlash tilida yozing.
8. $\frac{1}{4 \cdot \cos\left(\frac{\alpha}{2}\right) \cdot \cos\left(\frac{\beta}{2}\right) \cdot \cos\left(\frac{\lambda}{2}\right)}$ ni C++ dasturlash tilida yozing.
9. $7x^2b^2(4b - 3x)$ ni C++ dasturlash tilida yozing.
10. $(m+n)a + (n+m)b$ ni C++ dasturlash tilida yozing.
11. $\frac{1}{3} \cdot y \cdot (-0.002) \cdot y^5$ ni C++ dasturlash tilida yozing.
12. $\left(0.6ca + \frac{2}{5}bc\right) - \left(\frac{9}{2}ab - \frac{1}{8}cb\right) + 2(a+b)$ ni C++ dasturlash tilida yozing.
13. $\ln(x) + \ln(y) - a + 1$ ni C++ dasturlash tilida yozing.
14. $\frac{a^8(b^4)^8}{a\frac{c}{b^3} - (abc)^4}$ ni C++ dasturlash tilida yozing.
15. $1001x^2c^2(2b + 6x)$ ni C++ dasturlash tilida yozing.
16. $\frac{p}{2 \cdot \left(\frac{\alpha}{2}\right) \cdot \sin\left(\frac{\beta}{2}\right) \cdot \cos\left(\frac{\lambda}{2}\right)}$ ni C++ dasturlash tilida yozing.
17. $\sqrt[4]{\cos(x)}$ ni C++ dasturlash tilida yozing.
18. $e^{x+\cos(x)} + \sqrt{\pi}$ ni C++ dasturlash tilida yozing.

19. $\sqrt{\left(e^{x^2+\cos(x)}\right)^7}$ ni C++ dasturlash tilida yozing.

20. $b^{\sqrt{\frac{p}{2\left(\frac{\alpha}{2}\right)\cdot\sin\left(\frac{\beta}{2}\right)\cdot\cos\left(\frac{\lambda}{2}\right)}}}$ ni C++ dasturlash tilida yozing.

21. $\sqrt[4]{\cos(x)+tg(x)}$ ni C++ dasturlash tilida yozing.

1–variant $y = tg^2 3x + \sqrt{x+0,5|x|} + a \cdot \ln x^3$ δy $epda$ $x = 0,75$; $a = 5$.

2–variant $y = arctg \frac{2x}{z} + ctg 3x^2$, $z = 5x$ δy $epda$ $x = 0,89$.

3–variant $q = \frac{|x+y|}{x-\frac{2}{y}} - \arcsin \sqrt{x}$, $p = 5 \cdot \sin x - 8 \cos y$ δy $epda$ $x = 0,6$; $y = -2,6$.

4–variant $z = 2^x + \sin(x+y) - \frac{\sqrt[3]{x+y}}{\ln x}$, $y = 5|x|$ δy $epda$ $x = 0,95$.

5–variant $w = \sin^2 \frac{x^3}{|b-a^2|} - a^{2x-\sqrt{b}}$, δy $epda$ $x = 1,6$; $b = 4$; $a = 3$.

6–variant $y = \ln|x-0,6z^2| + \frac{\sqrt{x+y}}{0,5} - tg^2 x^3$, δy $epda$ $x = 1,7$; $y = 3,65$.

7–variant $y = e^{\sin x} + 0,656 \cdot tg \frac{x}{z} + 3\sqrt{a+1}$, $z = x+a$, δy $epda$ $x = 1,2$; $a = 0,69$.

8–variant $z = \arcsin x + \arccos x + \frac{2^{|x-5|}}{|x+y|}$, δy $epda$ $x = 0,35$; $y = -0,36$.

9–variant $c = \ln tg^2 \sqrt{x} + \frac{|0,6x-y|}{e^{x+y}} - ctg \sqrt{x}$, δy $epda$ $x = 1,68$; $y = -3,7$.

10–variant

$w = a^{2x-\sqrt{b}} + 6,13 \cdot a \cdot b^2 - \frac{arctgx}{2,38 \cdot a \cdot b}$, δy $epda$ $x = 0,15$; $a = 3$; $b = 9$.

11–variant $z = 2,6^{\ell nx} + \ell^{\ell nx} - \sin x \cdot \cos x$, $x = \sqrt{a}$, δy $epda$ $a = 1,5$.

12–variant $y = \sin \frac{x}{2,6} + \frac{|x+z|}{\sqrt{0,5x}} - 6 \sin x$, $x = \sqrt[3]{z+5}$, δy $epda$ $z = 4,5$.

13–variant $k = ctg \frac{x-4}{0,6y} + \ln e^{0,5xy} - \sqrt[3]{x-0,15}$, δy $epda$ $x = 1,8$; $y = 1,35$.

14–variant $w = \sin^2 \frac{x^3}{2,65} + \ln arctg^2 x^2 - 3,5\sqrt{x}$, δy $epda$ $x = 0,168$.

15–variant $y = \arcsin x + 0,69 \cdot a \cdot tg^3 x - 2^{\sqrt{x+0,4}}$, δy $epda$ $x = 0,6$; $a = 5$.

16–variant

$h = 4,5^a - \cos 2x^2 - \frac{8,46 \cdot c}{5^{a-c}} + ctg \ln^2 x$, δy $epda$ $x = 0,6$; $a = 2,5$; $c = 1,96$.

17–variant $p = \ln e^x - \frac{\sqrt[3]{x+4}}{e^{x-5}} + \cos \frac{2x}{y}$, $y = \sin x$, δy $epda$ $x = 0,159$.

18–variant $y = e^{\sqrt{2x+5}} + \frac{\ell n e^{x-5}}{|x-5|} - 3 \sin x$, $\bar{o}y$ $ep\partial a$ $x = 0,695$.

19–variant $y = e^{\sqrt{x+\sin x}} + \ell n x^3 + \arctg x^2$, $x = 5z$, $\bar{o}y$ $ep\partial a$ $z = 3,5$.

20–variant $z = \ctg \sin x^2 + \frac{0,55xy}{e^x} + \sqrt{x+y^2}$, $y = e^{x+5}$, $\bar{o}y$ $ep\partial a$ $x = 0,5$.

21–variant $y = e^{\arctg x} + \ell n \ctg^2 x - \frac{0,65x}{|x \cdot z|}$, $\bar{o}y$ $ep\partial a$ $x = 0,67$; $z = -5$.

22–variant

$a = 3^x + \frac{b+c}{c+d} + \ell n(x+b) + e^{c+\theta}$, $x = b \cdot c \cdot d$, $\bar{o}y$ $ep\partial a$ $b = 3$; $c = 4$; $d = 5$.

23–variant $y = e^{\arcsin x} - 2^{a+b} - \sqrt[3]{x+5ab}$, $a = x+b$, $\bar{o}y$ $ep\partial a$ $x = 0,5$; $b = 3,9$.

24–variant $w = e^{\ell n^2 x} - \sin 2,5x + \frac{|x-5|}{\sqrt{x}}$, $x = \ctg z$, $\bar{o}y$ $ep\partial a$ $z = 0,36$.

25–variant $y = \sin \frac{x-5}{0,6x} + \ell n \arctg x + \frac{\sqrt{|x-5 \cdot a|}}{0,7x}$, $\bar{o}y$ $ep\partial a$ $x = 0,75$; $a = -0,1$.

C++ dasturlash tilida masalalrni yechish

1.	$a = \frac{2 \cos(x - \pi/6)}{1/2 + \sin^2 y}$ $b = 1 + \frac{z^2}{3 + z^3/5}$	x = 1,426 y = -1,220, z = 3,5
2.	$j = \left x^{y/x} - \sqrt[3]{y/x} \right $ $\psi = (y-x) \frac{y - z/(y-x)}{1 + (y-x)^2}$	x = 1,825 y = 18,225 z = -3,298
3.	$S = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!}$, $\varphi = x(\sin x^3 + \cos^2 y)$	x = 0,335 y = 0,025
4.	$y = e^{-bt} \sin(at+b) - \sqrt{ bt+a }$, $S = b \sin(at^2 \cos 2t) - 1$	a = -0,5, b = 1,7 t = 0,44
5.	$\omega = \sqrt{x^2 + b} - b^2 \sin^3(x+a)/x$ $y = \cos^2 x^3 - x/\sqrt{a^2 + b^2}$	a = 1,5 b = 15,5 x = -2,9
6.	$S = x^3 \tg^2(x+b)^2 + a/\sqrt{x+b}$, $Q = \frac{bx^2 - a}{Ax}$	a = 16,5, b = 3,4 j = 0,61
7.	$R = x^2(x+1)/b - \sin^2(x+a)$, $S = \sqrt{xb/a} + \cos^2(x+b)^3$	a = 0,7, b = 0,05 x = 0,5
8.	$y = \sin^3(x^2 + a)^2 - \sqrt{x/b}$, $Z = \frac{x^2}{A} + \cos(x+b)^2$	a = 1,1, b = 0,004 x = 0,2
9.	$f = \sqrt[3]{mtgt + c \sin t }$, $z = m \cos(bt \sin t) + c$	m = 2, c = -1 t = 1,2, b = 0,7

10 .	$y = btg^2x - \frac{A}{\sin^2(x/a)}, S = b\sin(at^2 \cos 2t) - 1$	a = 3,2 b = 17,5, x = -4,8
11 .	$a = \frac{2\cos(x - \pi/6)}{1/2 + \sin^2 y}, b = 1 + \frac{z^2}{3 + z^3/5}$	x = 1,4 y = -1,2, z = 3,05
12 .	$j = \left x^{y/x} - \sqrt[3]{\frac{y}{x}} \right , \psi = (y-x) \frac{y - \frac{z}{(y-x)}}{1 + (y-x)^2}$	x = 1,8 y = 18,2 z = -3,02
13 .	$S = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!}, \varphi = x(\sin x^3 + \cos^2 y)$	x = 0,303 y = 0,02
14 .	$y = e^{-bt} \sin(at + b) - \sqrt{ bt + a }, S = b\sin(at^2 \cos 2t) - 1$	a = -0,05, b = 1,17 t = 0,24
15 .	$\omega = \sqrt{x^2 + b} - b^2 \sin^3(x + a)/x, y = \cos^2 x^3 - \frac{x}{\sqrt{a^2 + b^2}}$	a = 1,15 b = 15,05 x = -2,19
16 .	$S = x^3 tg^2(x + b)^2 + \frac{a}{\sqrt{x + b}}, Q = \frac{bx^2 - a}{Ax}$	a = 1,5, b = 3,14 j = 0,65
17 .	$R = x^2(x + 1)/b - \sin^2(x + a), S = \sqrt{xb/a} + \cos^2(x + b)^3$	a = 0,17, b = 0,5 x = 0,15
18 .	$y = \sin^3(x^2 + a)^2 - \sqrt{x/b}, Z = \frac{x^2}{A} + \cos(x + b)^2$	a = 1,01, b = 0,04 x = 0,12
19 .	$f = \sqrt[3]{mtgt + c \sin t }, z = m \cos(bt \sin t) + c$	m = 2, c = -1 t = 1,02, b = 0,17
20 .	$y = btg^2x - \frac{A}{\sin^2(x/a)}, S = b\sin(at^2 \cos 2t) - 1$	a = 3,02, b = 17,15 x = -4,28
21 .	$a = \frac{2\cos(x - \pi/6)}{1/2 + \sin^2 y}, b = 1 + \frac{z^2}{3 + z^3/5}$	x = 1,4, y = -1,2 z = 3,5
22 .	$j = \left x^{y/x} - \sqrt[3]{\frac{y}{x}} \right , \psi = (y-x) \frac{y - \frac{z}{(y-x)}}{1 + (y-x)^2}$	x = 1,18 y = 18,02 z = -3,2
23 .	$S = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!}, \varphi = x(\sin x^3 + \cos^2 y)$	x = 0,3 y = 0,012
24 .	$y = e^{-bt} \sin(at + b) - \sqrt{ bt + a }, S = b\sin(at^2 \cos 2t) - 1$	a = -0,15, b = 1,07 t = 0,4

25 .	$\omega = \sqrt{x^2 + b} - b^2 \sin^3(x + a)/x$, $y = \cos^2 x^3 - \frac{x}{\sqrt{a^2 + b^2}}$	a = 1,15, b = 15,05 x = -2,19
26 .	$S = x^3 \lg^2(x + b)^2 + \frac{a}{\sqrt{x + b}}$, $Q = \frac{bx^2 - a}{Ax}$	a = 16,15 b = 3,24
27 .	$R = x^2(x + 1)/b - \sin^2(x + a)$, $S = \sqrt{\frac{xb}{a}} + \cos^2(x + b)^3$	a = 0,17, b = 0,5 x = 0,5
28 .	$y = \sin^3(x^2 + a)^2 - \sqrt{x/b}$, $Z = \frac{x^2}{A} + \cos(x + b)^2$	a = 1,11, b = 0,04 x = 0,12
29 .	$f = \sqrt[3]{mtgt + c \sin t }$, $z = m \cos(bt \sin t) + c$	m = 2, c = -2 t = 1,02, b = 0,17
30	$y = b \lg^2 x - \frac{A}{\sin^2(x/a)}$, $y = \cos^2 x^3 - \frac{x}{\sqrt{a^2 + b^2}}$	a = 3,12, b = 17,5 x = -4,08

C++ dasturlash tilida masalalar

1. Berilgan N ta sonning ichidan manfiy sonlarini massivga joylashtirib natijani ekranga chiqaruvchi dastur tuzing.
2. Berilgan N ta sonning ichidan eng katta sonini topadigan dastur tuzing.
3. Bir o'lchovli massiv berilgan. Massivning har bir sonini bo'luvchilarini topadigan dastur tuzing. (Masalan: birinchi elementi uchun A[1]=40; Natija=> 2, 4, 5, 8, 10, 20;)
4. Berilgan N ta sonning juft sonlari nechtaligini aniqlaydigan dastur tuzing.
5. N ta son massivda joylashgan. Massiv elementlarini bitta chapga siljitadigan va birinchi elementini oxiriga joylashtiradigan dastur tuzing. (Masalan: N=3; A[1]=2; A[2]=7; A[3]=9; Natija=> A[1]=7; A[2]=9; A[3]=2;)
6. Bir o'lchovli massiv berilgan. Massivdagi toq va juft o'rnida joylashgan sonlarning yig'indisini topadigan dastur tuzing.
7. Bir o'lchovli massiv berilgan. Massivdagi eng kichik sonni tartib raqami bilan topadigan dastur tuzing.
8. Bir o'lchovli massiv berilgan. Massivdagi barcha sonlarning yig'indisini topadigan dastur tuzing.
9. Bir o'lchovli massiv berilgan. Massivdagi har bir sonini raqamlari yig'indisini topadigan dastur tuzing. (Masalan: birinchi elementi uchun A[1]=54; Natija=> 5+4=9;).
10. Bir o'lchovli massiv berilgan. Massivni turli xil sonlarini topadigan dastur tuzing. (Masalan: A[1]=2; A[2]=8; A[3]=2; A[4]=4; A[5]=3; Natija=> 2, 8, 4, 3;).
11. Bir o'lchovli massiv berilgan. Massivdagi sonlarni oddiy tartiblash usuli bilan tartiblab natijani ekranga chiqaradigan dastur tuzing.

12. Bir o'lchovli massiv berilgan. Massivdagi sonlarining o'rta arifmetigini topadigan dastur tuzing.
13. Berilgan N ta sonning ichidan eng katta soni necha marta qatnashganligini topadigan dastur tuzing.
14. Berilgan N ta sonning ichidan eng katta soni necha marta qatnashganligini topadigan dastur tuzing.
15. Bir o'lchovli massiv berilgan. Massivdagi tub sonlarni topadigan dastur tuzing.
16. Bir o'lchovli massiv berilgan. Massivdagi bir, ikki,... xonali sonlarni guruhlab ekranga chop etadigan dastur tuzing.
17. Berilgan N ta sonning ichidan eng katta soni necha marta qatnashganligini topadigan dastur tuzing.
18. Bir o'lchovli massiv berilgan. Massivdagi x-soniga karrali bo'lgan elementlarni topadigan dastur tuzing.
19. Berilgan N sonining raqamlarini bir o'lchovli massivga joylashtirib ekranga chop etadigan dastur tuzing.
20. Bir o'lchovli massiv berilgan. Massivdagi sonlarining ildizi butun chiqadigan sonlarni topadigan dastur tuzing.
21. Bir o'lchovli massiv berilgan. Massivdagi eng katta va eng kichik sonlarni farqini topadigan dastur tuzing.
22. Bir o'lchovli massiv berilgan. Massivdagi eng ko'p uchragan sonni aniqlaydigan dastur tuzing.
23. Bir o'lchovli massiv berilgan. Massiv sonlarining yig'indisi necha xonali son bo'lishini aniqlaydigan dastur tuzing.
24. Bir o'lchovli massiv berilgan. Massivning $[a,b]$ oralig'idagi sonlarini topadigan dastur tuzing.
25. Berilgan N, M sonlarining umumiy bo'luvchilarini bir o'lchovli massivga joylashtirib ekranga chop etadigan dastur tuzing.
26. Bir o'lchovli massiv berilgan. Massivdagi sonlarining o'rta arifmetigidan qiymati kichik bo'lgan elementlar sonini topadigan dastur tuzing.
27. Bir o'lchovli massiv berilgan. Massivda x sonini darajalarini joylashtiradigan dastur tuzing. Daraja 1 dan to n gacha. (Masalan: $N=3$; $X=4$; Natija=> $A[1]=4$; $A[2]=16$; $A[3]=64$;).
28. Bir o'lchovli massiv berilgan. Massivda ishora almashinishi sonini topadigan dastur tuzing.
29. Bir o'lchovli massiv berilgan. Massiv sonlarini x ga ko'paytiring va natijani ekranga chop etadigan dastur tuzing.
30. Bir o'lchovli massiv berilgan. Massivdagi sonlarni ko'piksimon (пузерковы) tartiblash usuli bilan tartiblab natijani ekranga chiqaradigan dastur tuzing.
31. Bir o'lchovli massiv berilgan. Massivdagi tartib raqami va elementi teng bo'lgan elementlarni ekranga chiqaradigan dastur tuzing.
32. Bir o'lchovli massiv berilgan. Massiv elementlarni kvadratga ko'taradigan dastur tuzing.
33. Bir o'lchovli massiv berilgan. Massivda x soni necha marta qatnashganligini aniqlaydigan dastur tuzing.

34. Bir o'lchovli massiv berilgan. $-A[1]+A[2]-A[3]+A[4]-\dots(-1)^n A[n]$ ni xisoblaydigan dastur tuzing. Bunda darajaga ko'tarish amalidan foydalanmang.
35. Bir o'lchovli massiv berilgan. Massivda takrorlanmaydigan sonlarni topadigan dastur tuzing. (Masalan: $A[1]=2$; $A[2]=8$; $A[3]=2$; $A[4]=4$; $A[5]=3$; Natija=> 8, 4, 3;).
36. A,B bir o'lchovli massiv berilgan. i – elementi uchun $A[i]< B[i]$ shartni qanoatlantiradigan elementlar sonini topadigan dastur tuzing. Bunda A,B massivlarini elementlar soni teng.
37. Bir o'lchovli massiv berilgan. Massivda x soni necha marta qatnashganligini aniqlaydigan dastur tuzing.
38. Bir o'lchovli satrli massiv berilgan. Berilgan so'z massivning nechta elementiga uchrashishini aniqlaydigan dastur tuzing.
39. Bir o'lchovli massiv berilgan. Massivdagi toq sonlarning sonini aniqlaydigan dastur tuzing.
40. Bir o'lchovli belgili massiv berilgan. Massivda nechta raqam belgisi qatnashganligini aniqlaydigan dastur tuzing.
41. N soni berilgan. Massivda 2 ni N gacha bo'lgan darajalarini joylashtiradigan dastur tuzing.
42. Massivni (Random) tasodifiy sonlar bilan to'ldiradigan, va massivda nechta toq soni mavjud ekanligini aniqlaydigan dastur tuzing.
43. Bir o'lchovli belgili massiv berilgan. Massivda nechta lotin harfi belgilari borligini aniqlaydigan dastur tuzing.
44. Bir o'lchovli massiv berilgan. Massivni birinchi yarmisi bilan qolgan yarmisini o'rnini almashtiradigan dastur tuzing. (Masalan: $N=5$; $A[1]=2$; $A[2]=8$; $A[3]=1$; $A[4]=4$; $A[5]=3$; Natija=> $A[1]=4$; $A[2]=3$; $A[3]=1$; $A[4]=2$; $A[5]=8$;).
45. Bir o'lchovli massiv berilgan. Massivni x va y ga karali elementlarini topadigan dastur tuzing.

C++ dasturlash tilida shartli operatorlardan foydalangan holda masalalarni yechish

$$\text{1-variant } y = \begin{cases} e^{\ln^2 x}, & \text{a} \text{z} \text{a} \text{p } x > 1 \\ \arctg \frac{2x}{z}, & \text{a} \text{z} \text{a} \text{p } x = 1 \\ \sqrt{|x - 0,5z|}, & \text{a} \text{z} \text{a} \text{p } x < 1 \end{cases} \quad \text{b} \text{y} \text{ e} \text{p} \text{d} \text{a } z = 5.$$

$$\text{2-variant } z = \begin{cases} \sqrt{2x^3 + 3\ln 5x}, & \text{a} \text{z} \text{a} \text{p } x > 0 \\ 2^{x-5} - \sin^2 x, & \text{a} \text{z} \text{a} \text{p } x = 0 \\ \arcsin x^2, & \text{a} \text{z} \text{a} \text{p } x < 0 \end{cases}$$

$$\text{3-variant } y = \begin{cases} \operatorname{ctg}^2 x + \sqrt[3]{x+1}, & \text{a} \text{z} \text{a} \text{p } x > 0 \\ |x^3 - e^{\operatorname{ctg} x}|, & \text{a} \text{z} \text{a} \text{p } x = 0 \\ \ln|x+0,5|, & \text{a} \text{z} \text{a} \text{p } x < 0 \end{cases}$$

$$\text{4--variant } z = \begin{cases} \ln 2,6x + 4,5 \operatorname{ctg}^2 x, & \text{a2ap } x > 0,5 \\ \sin^2 x + \sqrt{x+0,6}, & \text{a2ap } x = 0,5 \\ \sin(x+0,5x^2 + a \cdot b \cdot c), & \text{a2ap } x < 0,5 \end{cases}$$

$\delta y \text{ ep} \partial a \quad a = 5; \quad b = -0,6; \quad c = -7.$

$$\text{5--variant } y = \begin{cases} 4,3^{0,2x} \cdot \sin \sqrt{x}, & \text{a2ap } x > 1 \\ 4,17 \cdot \operatorname{arctg} |x-5|, & \text{a2ap } x = 1 \\ \operatorname{ctg}(x+0,16), & \text{a2ap } x < 1 \end{cases}$$

$$\text{6--variant } y = \begin{cases} \ln^2 x^2 + \frac{0,6x}{\sqrt{x+0,5}}, & \text{a2ap } x > 1 \\ (x+2)^2 + \operatorname{ctg} |x-3|, & \text{a2ap } x = 1 \\ \sqrt[3]{|x + \sin x|}, & \text{a2ap } x < 1 \end{cases}$$

$$\text{7--variant } z = \begin{cases} \ln |\operatorname{arctg} x + 0,7|, & \text{a2ap } x > 0 \\ \arcsin x, & \text{a2ap } x = 0 \\ e^{\operatorname{arctg} x}, & \text{a2ap } x < 0 \end{cases}$$

$$\text{8--variant } z = \begin{cases} x^\alpha + e^{x-5} + \operatorname{ctg} 3x, & \text{a2ap } x > 0,6 \\ 4,14 \cdot \operatorname{ctg}^2 x^3, & \text{a2ap } x = 0,6 \\ \frac{x+1}{\sqrt{|x|}}, & \text{a2ap } x < 0,6 \end{cases}$$

$\delta y \text{ ep} \partial a \quad \alpha = 5.$

$$\text{9--variant } y = \begin{cases} 2,6^{\ln x} - \sin \sqrt{x}, & \text{a2ap } x > 0,8 \\ a^{2x-\sqrt{b}} - \arccos x, & \text{a2ap } x = 0,8 \\ \cos 2x + |x - a \cdot b|, & \text{a2ap } x < 0,8 \end{cases}$$

$\delta y \text{ ep} \partial a \quad a = 5; \quad b = 4.$

$$\text{10--variant } y = \begin{cases} 2^{x+7} - 0,5 \ln(x+1), & \text{a2ap } x > 1 \\ e^{\operatorname{arctg} x} - 5x^2, & \text{a2ap } x = 1 \\ \frac{x-5}{2} + \operatorname{tg} |x-3|, & \text{a2ap } x < 1 \end{cases}$$

$$\text{11--variant } y = \begin{cases} \sin(\ln |x|) + \sqrt[3]{x+5}, & \text{a2ap } x > 1 \\ 0,6 \cos 2x + 4,8^a, & \text{a2ap } x = 1 \\ a^2 - e^x + |x| + \ln^2 x, & \text{a2ap } x < 1 \end{cases}$$

$\delta y \text{ ep} \partial a \quad a = 5,6.$

$$\text{12--variant } y = \begin{cases} 4,3^2 \cdot \operatorname{ctg} \sqrt{x} + e^{5x}, & \text{a2ap } x > 1 \\ \sqrt[3]{x^2 + 5}, & \text{a2ap } x = 1 \\ 2x + \operatorname{arctg} x^2, & \text{a2ap } x < 0 \end{cases}$$

$$\mathbf{13\text{--variant}} \quad y = \begin{cases} x^2 + 4x - \pi \cdot x & , \quad a\textit{gap} \quad x < 0 \\ (x^2 + 4)^2 - \sqrt{x^2 + 0,36} & , \quad a\textit{gap} \quad 0 \leq x \leq 1 \\ x \cdot (x^2 + 3) + \ell n^2(\pi + x) & , \quad a\textit{gap} \quad x > 1 \end{cases}$$

$$\mathbf{14\text{--variant}} \quad y = \begin{cases} e^{x+0,6} - |x-5| & , \quad a\textit{gap} \quad x \geq 5 \\ \ell n^2\left(1 + \frac{1}{x}\right) & , \quad a\textit{gap} \quad 0 < x < 5 \\ ct\,g\,x + tgx & , \quad a\textit{gap} \quad x \leq 0 \end{cases}$$

$$\mathbf{15\text{--variant}} \quad y = \begin{cases} e^{\ell n^2 x} - tg^2 \frac{x}{0,5} & , \quad a\textit{gap} \quad x = 1,2 \\ \sqrt{3x^2 + 9,36x + 5} & , \quad a\textit{gap} \quad x > 1,2 \\ \ell n |4x - 8,16| & , \quad a\textit{gap} \quad x < 1,2 \end{cases}$$