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45 2 -
4, $y=\frac{2^{\sqrt{x}}}{\sqrt{3}}$, $y=\left(\frac{2}{\sqrt{3}}\right)^{x}$, $y=\arcsin x$ 7, $y=\arcsin(3x)$5
4 7

5 2 -
4, $y=\sin^{3}\ln x$, $y=tg(x+y)\cdot 3^{x}$, $x-y=xy$5

5 2 -
4, $y=e^{-x^{2}}$, $y=e^{x^{2}}$, $y=\frac{\cos x}{x^{2}}$ 7, $y=\sin x+\cos x$ 5
4 7

75 2 - . $x\in(-\infty;+\infty)$
4, $y=x^{2}$, $y=x^{3}$, $y=\begin{cases} x, npu \wedge x<0 \\ 2x, npu \wedge x\geq 0\end{cases}$ 7, $y=\sqrt[3]{x}$ 5
7

5 2 -
4, $y=\frac{x}{\cos x}+\sin x$, $y=\frac{x(x+1)}{\sin x}$, $y=x^{3}+tg x$
7, $y=x^{3}\cdot tg x$ 5
4

65 - $y=\arcsin x$
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5 1 x . - 0

$y=\frac{\ln\left(x^2-9\right)}{x-4}+\frac{\sqrt{9-x}}{2^x-64}$

7

5 Y - 0 $y=\sin x+\sqrt{80}\cos x$ 5? 2
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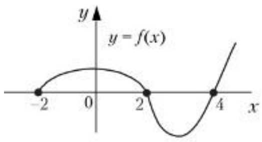

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5 (1, (, . - 0 $y=7\sin 5x$ 5

4>5 - - 0 $y=f(x)$ 5 1 1
$f\left(4x^2+3\right)=0$ 5

445 2 2 2 2 - - 0 $y=a(x+b)^2+c$ 3

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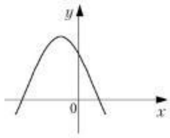

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45 2 $\lim_{n\to\infty}(-1)^n$
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5 2 . 1 - 0 . $x\to 0$
4, $y=\frac{1}{x}$, $y=x^{10}$, $y=\sin\frac{x}{3}$ 7, $y=\cos 2x$?, $y=\frac{1}{\cos 3x}$ 5

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5 2 . 1 - 0 . $x \to \infty$

4, $y=\sqrt[9]{x}$, $y=tg\,x$, $y=\log_{0,5} x$ 7, $y=\dfrac{1}{x^{-2}}$

, $y=arctg\,x$ 5

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5 2 1 . 1 - 0 . $x=0$

4, $y=\dfrac{1}{x}$, $y=\sqrt{x}$, $y=\begin{cases}1, npu \wedge x\le 0,\\ x, npu \wedge x>0;\end{cases}$

7, $y=\begin{cases}-x, npu\, x<0,\\ 1, npu \wedge x=0,\\ x, npu \wedge x\ge 0;\end{cases}$, $y=tg\,x$ 5

7

65 $\lim\limits_{x\to\infty}\dfrac{3x^2-2x-10}{2x^2+7x+5}$

4

5 $a=\lim\limits_{x\to\infty}\left(\dfrac{x^2+5}{x^2+3}\right)^{x^2}$ 2 $\ln a$ 5

5 $\lim\limits_{x\to+\infty}\left(\sqrt[3]{x^3+6x^2}-x\right)$ 5

5 $\lim\limits_{x\to+\infty}\left(\dfrac{x+3}{2x-5}\right)^{6x}$ 5

4 5 a 2 $\lim\limits_{x\to\infty}\dfrac{5x^4+3x^2-18}{ax^4-18x^2+3}=\dfrac{1}{2}$ 5

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445 a $\lim\limits_{x\to 0}\frac{tg\,ax}{8x}=25$

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$y=|x+2|,\ x_0=2$

$y=x-5,\ x_0=5$

$y=\sqrt[5]{x-8},\ x_0=8$

$y=tg\left(x+\frac{\pi}{4}\right),\ x_0=\pi$

$y=\sqrt{3x^2-4x+1},\ x_0=0$

x_0 (

$y=tg\left(1+\sqrt{x}\right)$

$y=x\arccos x$

$y=\sqrt[5]{x^2-8x+3}$

$y=x^2\ln\left(1-x^2\right)$

$y=3x-2\ \vee$.

a $y=\ln\left(x+a\sqrt{x^2-1}\right)$

$x_0=1$)

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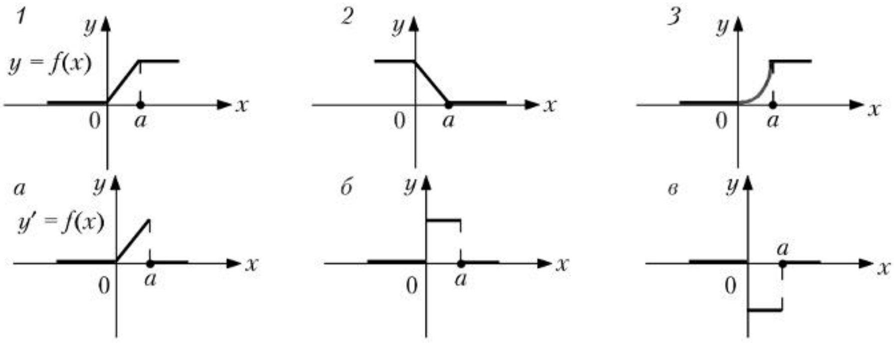

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x_0

$y=\left(x^2+5x-4\right)\ln x, x_0=1$

$y=\ln\left(e^{2x}+\sqrt{e^x+1}\right)-2\sqrt{2x}$, $x_0=0$

$x^2+2xy^2+3y^4=6$ 0 1 -

2 $x=arctg\, t$

$y=arctg\,\sqrt{t-1}$ $t=2$

3

$y=\frac{5}{11}\left(arctg\left(1+x^2\right)-\sqrt{3x^2+1}\right)$ $x_0=1, \Delta x=0,1$

4 . 1 5 $1,05$.

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$y=4x^2-x$ $x_0=3$

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0 1 . 0 . . . . . - - 0 1 2. - .))			
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$y = kx + b$, □□□ $k = \ldots; b = \ldots$

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□. □□□□□□□□□□□, □□□ □□□ $45°$)
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4, $\lim\limits_{x\to\infty}\frac{2^x - x}{x^2 - 1}$, $\lim\limits_{x\to -1}\frac{\sqrt{1+x}}{x^2-1}$, $\lim\limits_{x\to\infty}\frac{\sqrt{x}+\sin x}{\sqrt{x}-\sin x}$ 7, $\lim\limits_{x\to\infty}\frac{e^x + e^{-x} - 2}{x^2}$ 5

5 . $\lim\limits_{x\to\infty}\left(\frac{1+x}{2}\right)^{\frac{1}{x}}$

4

□5 2 . 1 - 0 .

4, $y = \frac{2x}{x-2}$, $y = \frac{2x}{x-3}$, $y = \frac{x-2}{x+2}$ 7, $y = \ln\left(1+\sqrt{x}\right)$ 5

4

75 . 1 - 0 . - 0
4, $y = \frac{2x}{1+x^2}$, $y = \frac{2x}{1-x^2}$, $y = \frac{1-x^2}{x}$ 7, $y = x^3 - x^2$?, $y = x^3 + x^2$ 5

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?5 - 0 $y = 3x + x^3$ 5

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x_0 - 0 $y=x^2(x-4)^2$

. 1 - 0 . - 0

4 $y=3^x-2^x$, $y=3^x-x^2 2^x$, $y=xe^{-x}$ 7, $y=\frac{2+x^2}{1+x\sqrt{x}}$

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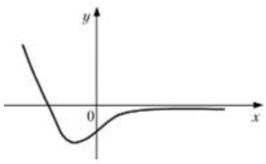
4 2 - - 0

4, $y=(x+1)e^x$

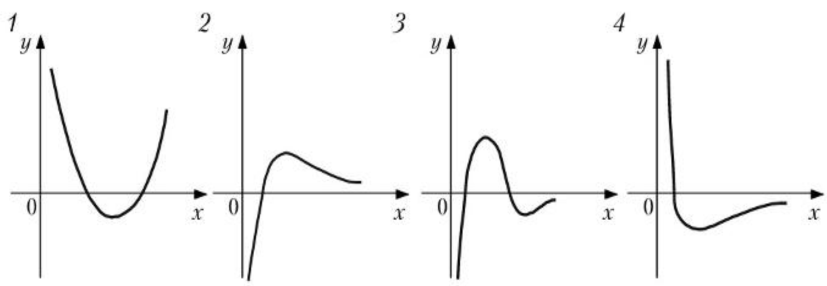
, $y=-(x+1)e^{-x}$

, $y=(x+1)e^{-x}$

7, $y=-(x+1)e^x$



44 2 - 2. 1 2 - - 0 $y=\frac{\ln x}{x}$



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4=5 - 0 $y = x^3 + x^2$ 34 = 5
$f_{наиб}(2) = 12$;

$f_{наим}(1) = f_{наим}(0) = 0$

4 5 . . . 6 $м^2$.
. . 5 1 1 2 . 1

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45 . - 2. . - 0 $\sqrt{1 - x^2 - y^2}$ 3
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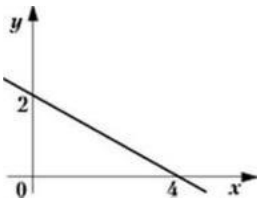
=5 - 0 $\frac{a}{b}$ 5



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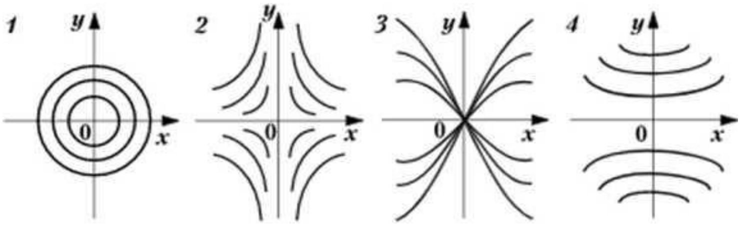
5 2 - 0



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75 1 . 1 - 0 x^{2y} (4 4,5

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5 3 - 0

$x^3+\frac{9}{4}x^2\ln y$ (= 4,5

4

65 9- - 0 . 2. 1 3 - 0 1= =1

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5 - 0 $x^3y^4+x^2y^3+2x$ (4 =, 9- - 0 3

$k=\frac{-a}{b}$ 2 2 (0 2 $\frac{a}{b}$,5

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5 ($x_0$2y_0, - 0

$\frac{\ln x}{v}+x$

$$x_0=1;$$

$$y_0=-1$$

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4 5 - 0 $z=4-x-x^2-y-4y^2$

$\frac{a}{b}$2 0 2

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45 1 - 0 ( ) $\frac{a}{3}x^b+2x^2+x+1$.

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$f(x)=ae^{bx+c}$

62 2 4

5 1 0 1 , - 0 F_1, $\frac{1}{a}(1+bx)^c$ (. 4 b342c = .

- 0 +)

362 3 2 =

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

0 $ax+b\sqrt{x}+d\ln|x|+C$, 2 2d 0 2 2d

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42 2d 7

5. $Найти \int \left(\frac{17-2x}{3}\right)^3 dx.$

0 $\frac{3}{a}\left(\frac{17+bx}{3}\right)^d + C,$ 2 2d 0 2 2d

3 2 3=2d 7

6 $\int \frac{2x+3}{4x-7} dx$

0 $\frac{1}{a}x + \frac{b}{d}\ln|4x-7| + C,$ 2 2d 0 2 $\frac{b}{d}$ 2

> 2 2d

=2 4 2d

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

0 $\frac{a}{b}e^{x^2+d}$ 2 2 2d 0 2 $\frac{a}{b}$ 2 > 2 2d

42 =2

d 3

$\int x^3 \ln x \, dx.$

$\frac{1}{a}x^b + \frac{1}{d}x^4 \ln x + c,$

2 2d 0 2 > *2* *3*

3462 72d 7

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

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0 $\frac{1}{a}\ln\left|\frac{x+b}{x+d}\right|+C$, 2 2d 0 2 > 2 2

d

2 3 2d 4

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

0 $arc\sin\frac{ax+b}{d}+C$ 2 2 2d 0 2 > 2 2

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42 42d =

45 - 0

x^2 > 4 2 5

0 $\frac{a}{b}$2 . 0 ,5

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$$\int_0^1 x\sqrt{e^{x^2+1}}\,dx=e^a-\sqrt{e^b}$$

5 0 . 1 .

$$\int_1^{e-1}\ln(x+1)\,dx=a+2\ln b$$

5 .

$$\int_1^2\frac{dx}{x^2+7x}$$

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0 $\frac{1}{a}\ln\frac{9}{b}$2 S 2 (S 0 ,5

S 3

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58 . S $\int_0^3 \frac{ax+1}{x+1}dx$. - 2

$y=\frac{x-2}{x+1}, y=-2, x=3$? 9 . 5

0 2 $S=9-\ln b$, (S 0 ,5

S 46

65 $y=\frac{2}{3}\sqrt{(x-1)^3}$ 4 7 5

0 $\frac{a}{b}$, S 2 (S . 0 2 $\frac{a}{b}$,5

S 47

5 2. . 0 . - 2 3

$x=y^2, x=4y-y^2, x=0.$

0 $\frac{a\pi}{3}$, S

S 44=

58 - . 0 . . 3

$\int_1^5 \ln x\, dx$ с точностью до 0,001?

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$y=(2x-3)e^{-x}$ . .] ,5

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4 5 . $\int_0^e \frac{dx}{x\ln^3 x}$ 2 1 5

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$1\sum_{n=1}^{\infty}\frac{1}{n^2};2\sum_{n=1}^{\infty}\frac{1}{\sqrt{n}};3\sum_{n=1}^{\infty}\left(\frac{1}{2}\right)^n;4\sum_{n=1}^{\infty}3^n;5\sum_{n=1}^{\infty}\frac{1}{n}.$

1 5

$а\sum_{n=1}^{\infty}\frac{(-1)^n n^2}{n+4};1\lim_{n\to\infty}u_n=1$, *ряд расходится;*

$б\sum_{n=1}^{\infty}\frac{3}{n};2\lim_{n\to\infty}u_n=\infty$, *ряд расходится;*

$в\sum_{n=1}^{\infty}\frac{4n+3}{4n-1};3\lim_{n\to\infty}u_n=0,$

для ответа на вопрос о сходимости ряда требуется

.

$г\sum_{n=1}^{\infty}\frac{3n-1}{5n^2+7}.4\lim_{n\to\infty}u_n=0$, *ряд сходится.*

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5 1 $\sum_{n=1}^{\infty} u_n$ 2

$v_n = \frac{1}{n^{\alpha}}$ . . . $\lim_{n\to\infty} \frac{u_n}{v_n} = k, k \neq 0, k \neq \infty.$

1 1 (4 1 1 ,

$a \sum_{n=1}^{\infty} \frac{3n-7}{n^2+\sqrt{n^2+7}}; б \sum_{n=1}^{\infty} \frac{3n-7}{n^2\sqrt{n^2+7}}$

= $\alpha = 1$

. $\alpha = 2$

65 $\sum_{n=1}^{\infty} u_n$ $u_n = \frac{5^n}{n+2^n}$ $l = \lim_{n\to\infty} \frac{u_{n+1}}{u_n}$

1

(4 1 2 1 2 . ,5

3

$l = \frac{5}{2}; 2$

58 $\sum_{n=1}^{\infty} u_n$. $l = \lim_{n\to\infty} \frac{u_{n+1}}{u_n}$. 5 3

. $\sum_{n=1}^{\infty} u_n$ 2

1 $l = 0,1 u \lim_{n\to\infty} u_n = 1;$

2 $l = 1 u \lim_{n\to\infty} u_n = 0;$

3 $l = 2 u \lim_{n\to\infty} u_n$ бесконечен;

4 $l = 0 u \lim_{n\to\infty} u_n = 0.$

5 $\sum_{n=1}^{\infty} \frac{(-1)^n}{3n^4-15}$. 1

(4 1 2 1 2

1 ,5

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0 1 . 0 . . . . - - 0 1 2. - .))			
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5 $\sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{n \cdot 10^n}$

2 2 ?

□

4 5 0 $\sum_{n=1}^{\infty} \frac{(-1)^{n+1} n}{2^n}$

$1 0<S<\frac{1}{2}; 2 \frac{3}{8}<S<\frac{5}{8}; 3 \frac{1}{8}<S<\frac{3}{8};$

$4 0<S<\frac{1}{8}.$

□

2

$\iint xy\,dx\,dy$ 2 9 . $4x^2+y^2 \le 4$

. $I=\int_1^3 dy \int_0^{2y} u\,dx$

$\int_0^2 dx \int_1^3 u\,dy + \int_2^6 dx \int_{\frac{x}{2}}^3 u\,dy$

$I=\iint_D \rho \sin\varphi \, d\rho \, d\varphi$ 2 . $\rho \le 2a\cos\varphi, 0 \le \varphi \le \frac{\pi}{2}$

$\frac{2}{3}a^2$

. 2 $\rho = a\cos\varphi$,
$\rho = b\cos\varphi$

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$\frac{\pi}{4}\left(b^2-a^2\right)$

2 1 . 1

$z=4-x^2-y^2, 2z=2+x^2+y^2$

$V=3\pi$

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$m=\frac{4}{3}a^2 b\lambda$

$J=\iiint_W \left(x^2+y^2+z^2\right)dxdydz$ 2 . 1

$3\left(x^2+y^2\right)+z^2=3a^2$

$\frac{4\pi a^5}{\sqrt{3}}$

2 . 1

$x^2+y^2+z^2=2z, x^2+y^2=z^2$

$V=\pi$

2 .
. .

$z_c=\frac{20R^2-15Rh+3h^2}{5(4R-h)}$

$I=\iiint_D (3x+4y)\,dxdydz$ 2 . $y=x, y=0,$

$x=1, z=5\left(x^2+y^2\right), z=0$

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$x^2+y^2=1, x^2+y^2=2z, z=0, x\geq 0, y\geq 0$2 - 0 . $\rho(x,y,z)=10x$

$m=1$

. 2 . 1

$z=1-x^2-y^2, x+y-1\leq 0, x\geq 0, y\geq 0,$
$z\geq 0$

$V=\frac{1}{3}$

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$I=\int_C x y^2 dx+y z^2 dy-z x^2 dz$. 2

$x^2+y^2+z^2=45, 2x+y=0$

$-173\frac{3}{4}$

$\oint_{-l} 2xdx-(x+2y)dy$.

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2 . . .

$mg(z_B-z_A)$

$\int_L xydl$. $x(t)=cost, y(t)=sint$2 .

. $\frac{\pi}{2}\leq t\leq \pi$

$\frac{-1}{2}$

$\int_L x^2ydy-y^2xdx$. $x=\sqrt{cost}$,

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$y=\sqrt{sint}$ $0 \le t \le \frac{\pi}{2}$

$\frac{\pi}{4}$

$\oint_C (2x+y)\,dx + 3x\,dy$.

$y=x^2, y=4,$
$x=0$.

$\frac{32}{3}$

C4

1 $\lim_{n\to\infty} \frac{(2n+1)^2-(n+1)^2}{n^2+n+1}$

$\lim_{n\to\infty} \frac{(2n+1)^2-(n+1)^2}{n^2+n+1} = \lim_{n\to\infty} \frac{4n^2+4n+1-n^2-2n-1}{n^2+n+1} = ¿$

$\lim_{n\to\infty} \frac{3n^2+2}{n^2+n+1} = \lim_{n\to\infty} \frac{3+\frac{2}{n}}{1+\frac{1}{n}+\frac{1}{n^2}} = \frac{3}{1} = 3$

. $\lim_{n\to\infty} \left(\frac{2+4+\ldots+2n}{n+3} - n \right)$

- . $s_n = \frac{2a_1+d(n-1)}{2} \cdot n$

$s_n = \frac{a_1+a_n}{2} \cdot n$

$1+2+\ldots+n = \frac{1+n}{2} \cdot n$

$\lim_{n\to\infty} \frac{n^2+n-n^2-3n}{n+3} = \lim_{n\to\infty} \frac{-2n}{n+3} = \lim_{n\to\infty} \frac{-2}{1+\frac{3}{n}} = -2$

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. $\lim_{n\to\infty}\left(\frac{4n^2+4n-1}{4n^2+2n+3}\right)^{1-2n}$

. $\lim_{n\to\infty}\left(1+\frac{1}{x}\right)^x=e$

$$\lim_{n\to\infty}\left(\frac{4n^2+4n-1}{4n^2+2n+3}\right)^{1-2n}=\lim_{n\to\infty}\left(\frac{4n^2+2n+3+2n-4}{4n^2+2n+3}\right)^{1-2n}=¿$$

$$\left[\lim_{n\to\infty}\left(1+\frac{2n-4}{4n^2+2n+3}\right)^{\frac{4n^2+2n+3}{2n-4}}\right]^{\frac{(2n-4)(1-2n)}{4n^2+2n+3}}=¿$$

$$e^{\lim\limits_{n\to\infty}\frac{(2n-4)(1-2n)}{4n^2+2n+3}}=e^{\lim\limits_{n\to\infty}\frac{-4n^2+10n-4}{4n^2+2n+3}}=e^{\lim\limits_{n\to\infty}\frac{-4+\frac{10}{n}-\frac{4}{n^2}}{4+\frac{2}{n}+\frac{3}{n^2}}}=e^{-1}=\frac{1}{e}$$

3 . $\lim_{x\to 3}\frac{\sqrt{x+13}-2\sqrt{x+1}}{\sqrt[3]{x^2-9}}$

$$\lim_{x\to 3}\frac{\sqrt{x+13}-2\sqrt{x+1}}{\sqrt[3]{x^2-9}}=\left[\frac{\sqrt{16}-2\sqrt{4}}{\sqrt[3]{9-9}}=\frac{0}{0}\right]=¿$$

$$\lim_{x\to 3}\frac{\left(\sqrt{x+13}-2\sqrt{x+1}\right)\left(\sqrt{x+13}+2\sqrt{x+1}\right)}{\sqrt[3]{x^2-9}\left(\sqrt{x+13}+2\sqrt{x+1}\right)}=¿$$

$$\lim_{x\to 3}\frac{x+13-4x-4}{\sqrt[3]{(x-3)(x+3)}\left(\sqrt{x+13}+2\sqrt{x+1}\right)}=¿$$

$$\lim_{x\to 3}\frac{-3x+9}{\sqrt[3]{(x-3)(x+3)}\left(\sqrt{x+13}+2\sqrt{x+1}\right)}=¿$$

$$\lim_{x\to 3}\frac{-3(x-3)^{\frac{2}{3}}}{\sqrt[3]{x+3}\left(\sqrt{x+13}+2\sqrt{x+1}\right)}=\frac{-3\cdot 0}{\sqrt[3]{6}\left(\sqrt{16}+2\sqrt{4}\right)}=\frac{0}{\sqrt[3]{6}\cdot 8}=0$$

. $\lim_{x\to 0}\frac{x\cdot\sin 2x}{1+\cos(x-3\pi)}$

$$\lim_{x\to 0}\frac{x\cdot\sin 2x}{1+\cos(x-3\pi)}=\left[\frac{0}{1-1}=\frac{0}{0}\right]=\lim_{x\to 0}\frac{x\cdot\sin 2x}{1-\cos x}=¿$$

$$\lim_{x\to 0}\frac{x\cdot 2\sin x\cos x}{2\sin^2\frac{x}{2}}=\left[\begin{matrix}\text{при } x\to 0 \sin x\ x\\ \text{эквивалентные функции}\end{matrix}\right]=\text{¿}$$

$$\lim_{x\to 0}\frac{x\cdot x\cdot\cos x}{\frac{x^2}{2}}=\frac{\cos 0}{\frac{1}{2}}=2\cdot 1=2$$

. $\lim_{x\to\pi}\frac{\cos 3x-\cos x}{tg^2 2x}$

$$\lim_{x\to\pi}\frac{\cos 3x-\cos x}{tg^2 2x}=\left[\frac{0}{0}\right]=-\lim_{x\to\pi}\frac{(2\sin 2x\cdot\sin x)\cdot\cos^2 2x}{\sin^2 2x}=\text{¿}$$

$$-2\lim_{x\to\pi}\frac{\sin x\cdot\cos^2 2x}{\sin 2x}=-2\lim_{x\to\pi}\frac{\sin x\cos^2 2x}{2\sin x\cos x}=\text{¿}$$

$$-\lim_{x\to\pi}\frac{\cos^2 2x}{\cos x}=-1\cdot\frac{1}{-1}=1$$

4 . - $y=\frac{2(3x^3+4x^2-x-2)}{15\sqrt{1+x}}$

$$y'=\frac{2}{15}\left[\frac{(3x^3+4x^2-x-2)'\cdot\sqrt{1+x}}{1+x}-\frac{(3x^3+4x^2-x-2)(\sqrt{1+x})'}{1+x}\right]=\text{¿}$$

$$\frac{2}{15}\left[\frac{(9x^2+8x-1)\sqrt{1+x}-\frac{3x^3+4x^2-x-2}{2\sqrt{1+x}}}{1+x}\right]=\text{¿}$$

$$\frac{2}{15}\left[\frac{2(9x^2+8x-1)(1+x)-3x^3-4x^2+x+2}{2\sqrt{1+x}(1+x)}\right]=\text{¿}$$

$$\frac{1}{15}\left[\frac{18x^2+18x^3+16x+16x^2-2-2x-3x^3-4x^2+x+2}{\sqrt{1+x}(1+x)}\right]=\text{¿}$$

$$\frac{1}{15}\cdot\frac{15x^3+30x^2+15x}{\sqrt{1+x}(1+x)}=\frac{x^3+2x^2+x}{\sqrt{1+x}(1+x)}=\frac{x(1+x)^2}{\sqrt{1+x}(1+x)}=x\sqrt{1+x}$$

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. . - $y=\sin\sqrt{3}+\frac{1}{3}\cdot\frac{\sin^2 3x}{3\cos 6x}$

$$y'=\frac{1}{9}\cdot\frac{\left(\sin^2 3x\right)'\cdot\cos 6x-\sin^2 3x\cdot\left(\cos 6x\right)'}{\cos^2 6x}=¿$$

$$\frac{1}{9}\cdot\frac{2\sin 3x\cdot\cos 3x\cdot 3\cdot\cos 6x+6\sin^2 3x\cdot 6\cdot\sin 6x}{\cos^2 6x}=¿$$

$$\frac{1}{9}\cdot\frac{3\cdot\sin 6x\cdot\cos 6x+6\cdot\sin^2 3x\cdot\sin 6x}{\cos^2 6x}=¿$$

$$\left[\sin^2 3x=\frac{1-\cos 6x}{2}\right]=\frac{1}{3}\cdot\frac{\sin 6x\left(\cos 6x+1-\cos 6x\right)}{\cos^2 6x}=¿$$

$$\frac{1}{3}tg\,6x\cdot sec\,6x$$

- -

$$y=\frac{4x-x^2}{4},\ x_0=2$$

$$y-y_0=f'\left(x_0\right)\cdot\left(x-x_0\right)$$
$$y_0=y\left(x_0\right)=y(2)=\frac{4\cdot 2-2^2}{4}=\frac{8-4}{4}=1$$
$$y'=\frac{1}{4}\left(4x-x^2\right)'=\frac{1}{4}\left(4-2x\right)=\frac{2-x}{2}$$

$$y'\left(x_0\right)=y'(2)=0$$
$$y-1=0\cdot\left(x-2\right)$$
$$y=1$$
$$y-y_0=\frac{-1}{f'\left(x_0\right)}\left(x-x_0\right)$$
$$y-1=\frac{-x-2}{0}$$
$$x-2=0$$
$$x=2$$

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1 - - - $y=x\cdot \arcsin\frac{1}{x}+\ln\left|x+\sqrt{x^2-1}\right|, x>0$

$$y'=x'\cdot\arcsin\frac{1}{x}+x\left(\arcsin\frac{1}{x}\right)'+\frac{\left|x+\sqrt{x^2-1}\right|'}{\left|x+\sqrt{x^2-1}\right|}=¿$$

$$\arcsin\frac{1}{x}+x\cdot\frac{\left(\frac{-1}{x^2}\right)}{\sqrt{1-\frac{1}{x^2}}}+\frac{\left|1+\frac{2}{2\sqrt{x^2-1}}\right|}{\left|x+\sqrt{x^2-1}\right|}=¿$$

$$\arcsin\frac{1}{x}-\frac{x^2}{\sqrt{x^2-1}\cdot x^2}+\frac{\left|\sqrt{x^2-1}+x\right|}{\left|x+\sqrt{x^2-1}\right|\cdot\sqrt{x^2-1}}=\arcsin\frac{1}{x}$$

$$dy=\arcsin\frac{1}{x}\cdot dx$$

11 - $y=16x^3+12x^2-5$

. - $D(y)=R$

$y'=48x^2+24x$

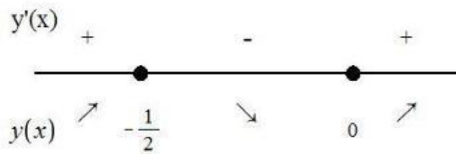
$D(y)=R$ 1

$y'=0$

$48x^2+24x=0$

$24x(2x+1)=0$

$x=0$ *или* $x=\frac{-1}{2}$ – *стационарные точки*



$x_{max}=\frac{-1}{2}$

$x_{min}=0$

$$y_{max}=16\cdot\left(\frac{-1}{2}\right)^3+12\cdot\left(\frac{-1}{2}\right)^2-5=\frac{-16}{8}+\frac{12}{4}-5=-2+3-5=¿$$

-4

1 -

$$y=\frac{10x+10}{x^2+2x+2}\ при\ x\in[-1;2]$$

$$y(-1)=\frac{-10+10}{1-2+2}=0$$

$$y(2)=\frac{20+10}{4+4+2}=\frac{30}{10}=3$$

$$y'=\frac{(10x+10)'(x^2+2x+2)-(10x+10)(x^2+2x+2)'}{(x^2+2x+2)^2}=¿$$

$$\frac{10(x^2+2x+2)-(10x+10)(2x+2)}{(x^2+2x+2)^2}=¿$$

$$\frac{10x^2+20x+20-20x^2-20x-20x-20}{(x^2+2x+2)^2}=\frac{-10x^2-20x}{(x^2+20+2)^2}=¿$$

$$-\frac{10x(x+2)}{(x^2+2x+2)^2}$$

$$y'=0\,при\,x=0;\,x=-2;\,0\in[-1;2]$$

$$y(0)=\frac{10}{2}=5$$

$$y_{наибольшее}=5;\,y_{наименьшее}=0$$

1 - . - $y=\frac{x^3-4}{x^2}$

. $D(y)=(-\infty;0)\cup(0;+\infty)$

$y(-x)\neq y(x)$

$y(-x)\neq -y(x)$

, .

$y=0\,при\,x=\sqrt[3]{4}$ – *координаты пересечения графика с осью OX*

$x\neq 0$.

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$$y'=\frac{(x^3-4)'\cdot x^2-(x^3-4)\cdot(x^2)'}{x^4}=\frac{3x^2\cdot x^2-(x^3-4)\cdot 2x}{x^4}=¿$$

$$\frac{3x^4-2x^2+8x}{x^4}=\frac{x^4+8x}{x^4}=\frac{x^3+8}{x^3}$$

y' . . $x=0$ $x=0$ 1 . $y(x)$ 3
1 5

$y'=0$. $x^3+8=0$ $x=-2$ 5

$x_{max}=-2$

$$y_{max}=\frac{(-2)^3-4}{(-2)^2}=\frac{-8-4}{4}=-3\text{ – максимум функции}$$

$x\in(-\infty;-2]$ - . $x\in[-2;0)$ - .
$x\in(0;+\infty)$ - 5

6, - .

$$y''=\frac{(x^3+8)'\cdot x^3-(x^3+8)\cdot 3x^2}{x^6}=\frac{3x^2\cdot x^3-3x^5-24x^2}{x^6}=¿$$

$$-\frac{24x^2}{x^6}=\frac{-24}{x^4}$$

$y''<0$ - . 1

$y''\neq 0$ . .

, .

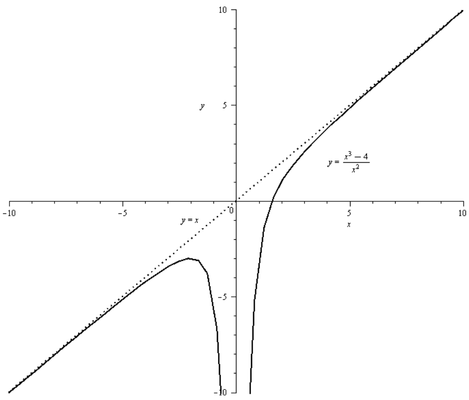
$$\text{Так как } \lim_{x\to\pm 0}\frac{x^3-4}{x^3}=-\infty,\ \text{то } x=0 - \text{вертикальная асимптота}$$

$y=kx+b$.

$$k=\lim_{x\to\pm\infty}\frac{x^3-4}{x\cdot x^2}=\lim_{x\to\pm\infty}\left(1-\frac{4}{x^3}\right)=1$$

$$b=\lim_{x\to\pm\infty}\left(\frac{x^3-4}{x^2}-x\right)=\lim_{x\to\pm\infty}\frac{x^3-4-x^3}{x^2}=\lim_{x\to\pm\infty}\left(\frac{-4}{x^2}\right)=0$$

$y=x$.



С4

1 $\int\frac{x\cdot\cos x\,dx}{\sin^3 x}$

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$$\int\frac{x\cdot\cos x\,dx}{\sin^3 x}=\left[\begin{array}{ll} u=x & dv=\frac{\cos x}{\sin^3 x}dx \\ du=dx & v=\int\frac{\cos x}{\sin^3 x}dx=\int \sin^{-3}x\,d(\sin x)=¿\frac{\sin^{-2}x}{-2}=\frac{-1}{2\sin^2 x}\end{array}\right]=¿$$

$$-\frac{x}{2\sin^2 x}+\int\frac{dx}{2\sin^2 x}=\frac{-x}{2\sin^2 x}-\frac{1}{2}ctg\,x+C$$

1 ν . / - 0 .
-- 0 $d(\sin x)=cosxdx$

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

/ . / . . 3
. / 3= 1 . 3
. / 1 / . / - / 0

$\int_a^b f(x)\,dx=F(b)-F(a)$.

$$\int_{-2}^{0}(x^2+2)e^{\frac{x}{2}}dx=\begin{bmatrix}u=x^2+2 & dv=e^{\frac{x}{2}}dx\\ du=2xdx & v=\int e^{\frac{x}{2}}dx=¿\,2\cdot\int e^{\frac{x}{2}}d\left(\frac{x}{2}\right)=2e^{\frac{x}{2}}\end{bmatrix}=¿$$

$$2e^{\frac{x}{2}}(x^2+2)\Big|_{-2}^{0}-2\int_{-2}^{0}e^{\frac{x}{2}}\cdot 2xdx=2e^0\cdot-2e^{-1}\cdot 6-4\cdot\int_{-2}^{0}xe^{\frac{x}{2}}dx=¿$$

$$\begin{bmatrix}u=x & dv=e^{\frac{x}{2}}dx\\ du=dx & v=2e^{\frac{x}{2}}\end{bmatrix}=4-\frac{12}{e}-4\cdot$$

$$4-\frac{12}{e}-4$$

$$4-\frac{28}{e}+16-\frac{16}{e}=20-\frac{44}{e}$$

1 ν . / . - 0 . -- 0
$d\left(\frac{x}{2}\right)=\frac{1}{2}dx$, - /

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

1 . / / / . /
$\sqrt{x}=t$ -- 0 / 2 -- 0 3
/ . / d . - / .
- 0 2. 4 =

$$\int \frac{1-\sqrt{x}}{\sqrt{x}(x+1)}dx = \left[\begin{matrix}\sqrt{x}=t \\ \frac{dx}{2\sqrt{x}}=dt\end{matrix} \quad dx=2\sqrt{x}dt=¿2tdt\right] = \int \frac{(1-t)2tdt}{t(t^2+1)} = ¿$$

$$2\int \frac{(1-t)dt}{t^2+1} = 2\int \frac{dt}{t^2+1} - 2\int \frac{tdt}{t^2+1} = 2\,arctg\,t -$$

$$-2\cdot\frac{1}{2}\int \frac{t^2+1}{t^2+1} = 2\,arctg\,t - \ln(t^2+1) = 2\,arctg\,\sqrt{x} - \ln(x+1) + C$$

8 . / / . 1 / . / - t^2+1.

- - $d(t^2+1)=2tdt$

3 . - - /

$x=4-(y-1)^2$ $x=y^2-4y+3$

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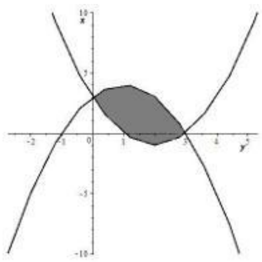
$$4-(y-1)^2 = y^2-4y+3$$
$$4-y^2+2y-1 = y^2-4y+3$$
$$2y^2-6y=0$$
$$2y(y-3)=0$$

$y=0, y=3$. $y\in[0;3]$



$S=\int_a^b [f_1(y)-f_2(y)]dy$

$f_1(y)>f_2(y)$ $[a;b]$

$$S=\int_0^3 [4-(y-1)^2-y^2+4y-3]dy = \int_0^3 (-2y^2+6y)dy = ¿$$

$$-\frac{2y^3}{3}+\frac{6y^2}{2} = \left(\frac{-2y^3}{3}+3y^2\right)\Big|_0^3 = \frac{-2\cdot 27}{3}+3\cdot 9 = -18+27=9$$

$$y=\frac{1-e^{x}-e^{-x}}{2},0\le x\le 3$$

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$$L=\int_{\alpha}^{\beta}\sqrt{1+\left(f^{'}(x)\right)^{2}}dx$$

. $f^{'}(x)$

$$f^{'}(x)=y^{'}=\frac{-e^{x}+e^{-x}}{2}$$

$$(y^{'})^{2}=\frac{e^{-2x}-2e^{-x}\cdot e^{x}+e^{2x}}{4}=\frac{e^{2x}+e^{-2x}+2}{4}$$

. .

.

$$1+\frac{e^{2x}+e^{-2x}-2}{4}=\frac{e^{2x}+2+e^{-2x}}{4}=\frac{\left(e^{x}+e^{-x}\right)^{2}}{4}$$

$$L=\int_{0}^{3}\frac{e^{x}+e^{-x}}{2}dx=\frac{1}{2}\left(e^{x}-e^{-x}\right)\Big|_{0}^{3}=\frac{1}{2}\left[\left(e^{3}-e^{-3}\right)-\left(e^{0}-e^{0}\right)\right]=¿$$

$$\frac{e^{3}-e^{-3}}{2}$$

. - $z=\sqrt{x^{2}+y^{2}-1}$

4

4 . - $z=\frac{\cos x^{2}}{x+y}$

$$z_{x}^{'}=\frac{\left(\cos x^{2}\right)_{x}^{'}\cdot(x+y)-\cos x^{2}\cdot(x+y)_{x}^{'}}{(x+y)^{2}}=¿$$

$$\frac{-2x\cdot\sin x^{2}\cdot(x+y)-\cos x^{2}}{(x+y)^{2}}$$

$$z_{y}^{'}=\cos x^{2}\cdot\left(\frac{1}{x+y}\right)_{y}^{'}=\frac{-\cos x^{2}}{(x+y)^{2}}$$

. -

$$z=\frac{4y}{\sqrt{y^{2}-x}},где\ x=t\cdot\cos t,y=t\cdot\sin t$$

$$\frac{dz}{dt}=\left(\frac{4y}{\sqrt{y^{2}-x}}\right)_{x}^{'}\cdot\frac{dx}{dt}+\left(\frac{4y}{\sqrt{y^{2}-x}}\right)_{y}^{'}\cdot\frac{dy}{dt}$$

$$\left(\frac{4y}{\sqrt{y^2-x}}\right)'_x = 4y\cdot\left(\left(y^2-x\right)^{\frac{-1}{2}}\right)'_x = 4y\cdot\left(\frac{-1}{2}\right)\cdot\left(y^2-x\right)^{\frac{-3}{2}}\cdot$$

$$\cdot\left(y^2-x\right)'_x = \frac{2y}{\left(y^2-x\right)^{\frac{3}{2}}} = \frac{2y}{\sqrt{\left(y^2-x\right)^3}}$$

$$\left(\frac{4y}{\sqrt{y^2-x}}\right)'_y = \frac{4\cdot\sqrt{y^2-x} - 4y\cdot\dfrac{2y}{2\sqrt{y^2-x}}}{y^2-x} = \frac{4\left(y^2-x\right)-4y^2}{\sqrt{\left(y^2-x\right)^3}} = ¿$$

$$-\frac{4x}{\sqrt{\left(y^2-x\right)^3}}$$

$$\frac{dx}{dt} = \cos t - t\cdot\sin t$$

$$\frac{dy}{dt} = \sin t - t\cdot\cos t$$

$$\frac{dz}{dt} = \frac{2y}{\sqrt{\left(y^2-x\right)^3}}\cdot(\cos t - t\cdot\sin t) - \frac{4x}{\sqrt{\left(y^2-x\right)^3}}\cdot(\sin t - t\cdot\cos t) = ¿$$

$$\frac{2}{\sqrt{\left(y^2-x\right)^3}}\cdot(y\cos t - yt\sin t - 2x\sin t + 2xt\cos t) = ¿$$

$$\frac{2}{\sqrt{\left(y^2-x\right)^3}}\cdot\left((y+2xt)\cdot\cos t - (yt+2x)\cdot\sin t\right)$$

. - 0 $tg^3 z + \sin x + \cos y - e^x = 0$

$$\frac{3tg^2 z}{\cos^2 z}\cdot z'_x + \cos x - e^x = 0$$

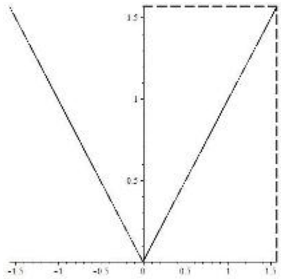
$$z'_x = \frac{\left(e^x - \cos x\right)\cdot\cos^2 z}{3tg^2 z}$$

$$\frac{3tg^2 z}{\cos^2 z}\cdot z'_y - \sin y = 0$$

$$z'_y = \frac{\sin y\cdot\cos^2 z}{3tg^2 z}$$

1 - 0 $z = \sin x + \sin y + \sin(x+y)$

. $0 \le x \le \frac{\pi}{2}$ $0 \le y \le \frac{\pi}{2}$



\- . 1

$$\begin{cases} z'_x = \cos x + \cos(x+y) \\ z'_y = \cos y + \cos(x+y) \end{cases}$$

.

$\cos y - \cos x = 0$

$\cos x = \cos y$

$$\left[\begin{array}{l} y = x \\ y = -x - \textit{не принадлежит области} \end{array}\right.$$

$y = x$.

$\cos x + \cos 2x = 0$

$2\cos^2 x + \cos x - 1 = 0$

$D = 1 + 8 = 3^2$

$$\cos x = \frac{-1 \pm 3}{4}; \left[\begin{array}{l} \cos x = -1 \\ \cos x = \frac{1}{2} \end{array}\right.$$

$$\left[\begin{array}{l} x = \pi + 2\pi n - \textit{не принадлежит области} \\ x = \pm\frac{\pi}{3} + 2\pi n - \textit{указанной области принадлежит } x = \frac{\pi}{3} \end{array}\right.$$

. $\left(\frac{\pi}{3}; \frac{\pi}{3}\right)$

\- 1

$z(0,0) = 0$

$z\left(0; \frac{\pi}{2}\right) = 2$

$z\left(\frac{\pi}{2}; 0\right) = 2$

$z\left(\frac{\pi}{2}; \frac{\pi}{2}\right) = 2$

$$z\left(\frac{\pi}{3};\frac{\pi}{3}\right)=\frac{\sqrt{3}}{2}+\frac{\sqrt{3}}{2}+\frac{\sqrt{3}}{2}=\frac{3\sqrt{3}}{2}\approx 2.6$$

$$z_{наиб}=\frac{3\sqrt{3}}{2}$$

$$z_{наим}=0$$

45 $\iint xy\,dx\,dy$ 2 . 37
. $y^2=2x$

=5 . $I=\int\limits_{-\sqrt{x}}^{1}dx\int\limits_{-\sqrt{4-x^2}}^{0}v\,dy$

$$\int\limits_{-2}^{-\sqrt{3}}dy\int\limits_{-\sqrt{4-y^2}}^{\sqrt{4-y^2}}v\,dx++\int\limits_{-\sqrt{3}}^{-1}dy\int\limits_{-\sqrt{4-y^2}}^{1}v\,dx++\int\limits_{-1}^{0}dy\int\limits_{-\sqrt{3}}^{1}v\,dx$$

5 $I=\iint\limits_{D}\rho\sin\varphi\,d\rho\,d\varphi$ 2 2

$\rho=a,\varphi=\frac{\pi}{2},\varphi=\pi$

$\frac{a^2}{2}$

75 . 2 $y^2=x^3,y^2=8(6-x)^3$

$38\frac{2}{4}$

5 2 1 . 1
$y=x^2,y=1,x+y+z=4,z=0$

$V=\frac{68}{15}$

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$x_c=0,y_c=\frac{a}{2}$

5
$K=\iiint\limits_{T}y\,dx\,dy\,dz$ 2 y . 1 $y=\sqrt{x^2+y^2}u\ y=h,h>0$

$\frac{\pi h^4}{4}$

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$x+y+z=4$, $x=3$, $y=2$, $x=0$, $y=0$, $z=0$

H $V=\frac{55}{6}$

O5 2 0 . 1 $x^2=2y$. $y+z=1$, $2y+z=2$ 2 . 9

H $m=\frac{8\sqrt{2}}{35}$

4 5 $I=\iiint_D 8y^2 z e^{2xyz}\,dxdydz$ 2

. H $x=-1$, $x=0$, $y=0$, $y=2$, $z=0$, $z=1$

H $5-e^{-4}$

445 2 . 1 H $z=x^2+y^2$, $z^2=x^2+y^2$, $y\geq 0$ 2 - 0 . $\rho(x,y,z)=70yz$

H $m=4$

4 5 . E 2 . 1 H $z=x^2+y^2$, $z^2=x^2+y^2$

H $V=\frac{\pi}{6}$

4 5 $I=\int_L \left(4\sqrt[3]{x}\,\|-e\sqrt{y}\right)dl$ 2 (34 , (4, . $x=\cos^3 t$, $y=\sin^3 t$ 5

H $\frac{-46}{7}$

475 (36 , (3 7 ,5 $I=\int_C xy^2dx+yz^2dy-zx^2dz$ . . 5

H 91

4 5 $x=2a\cos t-a\cos 2t$, $y=2a\sin t-a\sin 2t$ 5

H $16a$

465 $\int_L (x-y)dx+xdy$. 1 . 9 . $\frac{x^2}{8}+\frac{y^2}{4}=1$ 5 . 5

H $\frac{3\sqrt{3}-1}{3}$

4 5 $\oint_C (x+y)dx+(x-y)dy$. $x^2+y^2=4$ (. -) ,5

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4	. . $\lim\limits_{n\to\infty}\left(\frac{3n+1}{3n-1}\right)^{2n+3}$.	$\sqrt[3]{e^4}$
	. . $\lim\limits_{n\to\infty}\left(\frac{n+3}{n+5}\right)^{n+4}$.	e^{-2}
	. - 0 $\lim\limits_{x\to 3}\frac{\sqrt{x+13}-2\sqrt{x+1}}{x^2-9}$.	$\frac{-1}{16}$
7	. - 0 $\lim\limits_{x\to 1}\frac{x^2-2x+1}{x^3-x^2-x+1}$.	$\frac{1}{2}$
	. - 0 2 . . . 3 $\lim\limits_{x\to 1}\left(\frac{x}{x-1}-\frac{1}{\ln x}\right)$	$\frac{1}{2}$
6	. - 0 2 . . . $\lim\limits_{x\to 0}\frac{tgx-\sin x}{x-\sin x}$	
	. - 0 $y=\mathrm{arctg}\left(\mathrm{tg}\frac{x}{2}+1\right)$.	$\frac{sec^2\frac{x}{2}}{2\left(\left(tg\frac{x}{2}+1\right)^2+1\right)}$
	. - 0 $y=¿$	$y\cdot\left(\frac{2xcosx}{x^2+1}-\ln\left(x^2+1\right)sinx\right)$
	. y'_x - 0 2 . 3 $\{x=e^t\cos t,\|$	$\frac{e^t sint+e^t cost}{e^t cost-e^t sint}$
4	. . y'_x, y''_{xx} . - 0 $x=e^{2t}, y=e^{3t}$ 5	$\frac{3e^t}{2};\frac{3}{4e^t}$

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44	8 2 - $y=\frac{\sin x}{x}$ $xy'+y=\cos x$5	$\frac{2xy^3-14xy}{-3x^2y^2+7x^2+\frac{1}{\sqrt{1-y^2}}}$
4=	y' $\arcsin y=x^2y^3-7yx^2$	
4C	y' $x^2y^4+10=3x^4y^3+x^5-5$	$\frac{5x^4+12x^3y^3-2xy^4}{4x^2y^3-9x^4y^2}$
47	y' $e^{yx}=\ln(x^2+y^2)$	$\frac{2x-y(x^2+y^2)e^{yx}}{x(x^2+y^2)e^{yx}-2y}$
4	. y' 2 . - - - $y=¿$	$\frac{y(\ln(tgx)+xlnxcsc(x)sec(x))}{x}$
46	- - - $y=\text{arctg}\,\frac{x^2-1}{x}$.	$dy=\frac{x^2+1}{x^4-x^2+1}dx$
4	- - $y=\frac{2x}{x^2+1}, x_0=1$5	$y=1$
4	$y=\frac{2+\sqrt{x}}{2-\sqrt{x}}$ 1 5 3	$y_k=\frac{2x}{3}-11$ $y_n=\frac{-3x}{2}+\frac{17}{2}$

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4	. $\int(4x-2)\cos 2x\,dx$.	(= 34, (= , (= ,
=	. $\int\frac{1+\ln x}{x}dx$.	$\frac{lnx(lnx+2)}{2}+C$
C	$\int\frac{xdx}{\cos^2 x}$.	$xtgx+\ln(cosx)+C$
7	. $\int\frac{dx}{x\sqrt{x^2+1}}$.	$\frac{-1}{\sqrt{2}}arctg\sqrt{\frac{2}{x^2-2}}+C$
	. $\int x\sqrt{x-2}\,dx$5	$\frac{2}{15}\sqrt{(x-2)^3}$(C 7,
6	$\int xe^{2x}dx$5	$\frac{1}{4}e^{2x}(2x-1)+C$
	$\int\frac{x^3}{x^2+1}dx$.	$\frac{1}{2}$

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	. $\int (4x+3)\sin 5x\,dx$ .5	$\frac{1}{25}(4\sin(5x)-5(4x+3)\cos(5x))+C$
	. $\int (4-3x)e^{-3x}dx$.	$e^{-3x}(x-1)+C$
4	. $\int (7x-10)\sin 4x\,dx$.	$\frac{1}{16}(7\sin(4x)+(40-28x)\cos(4x))+C$
44	. $\int \frac{3x^2-2}{x^3-x}dx$.	$\frac{1}{2}\ln(1-x^2)+2\ln x+C$
4	. $\int (4x-3)e^{-2x}dx$.	$e^{-2x}\left(\frac{1}{2}-2x\right)+C$
4	. $\int_0^{\sqrt{3}} \frac{\operatorname{arctg}x+x}{1+x^2}dx$.	$\frac{\pi^2}{18}+\ln 2$
47	. $\int_0^{\pi} (x^2-3x+2)\sin x\,dx$.	$(\pi-x)\pi$
4	. $\int_{-2}^{0} (x+6)\cos 2x\,dx$.	$\frac{1}{4}(1+8\sin 4-\cos 4)$
46	$\int_3^6 \frac{x^2-9}{x^4}dx$.	$\frac{5}{72}$
4	. - 2 $y=\arccos x,\ y=0,\ x=0$.	4
4	. - 2 y=¿	
4	. - 2 $y=\sqrt{x}$ $y=x^2$5	$\frac{1}{3}$
	. - 2 $y=4-x^2$ $y=x^2-2x$5	
4	. - 2 $y=2x-x^2+3,\ y=x^2-4x+3$.	
	. - 2 x=¿	
	. - 2 $y=\sqrt{4-x^2},\ y=0,\ x=0,\ x=1$.	$\frac{1}{6}(3\sqrt{3}+2\pi)$

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4	. . 1 - 0 $\frac{\operatorname{sh} 2x}{x} - 2.$	. $shx = x + \frac{x^3}{3!} + \ldots + \frac{x^{2n+1}}{(2n+1)!} + \ldots$
	. . 1 - 0 $\frac{7}{12 + x - x^2}.$	9 3 1 1 $\frac{1}{x+3} - \frac{1}{x-4}$ 5 8 3 5
	. . 1 - 0 $2x\cos^2\left(\frac{x}{2}\right) - x$	. . - . . 5 8 3 3 5
7	. . 1 - 0 $\ln\left(1 - x - 6x^2\right)$	. - 0 (43 , (4 ,58 5
	. . 1 - 0 $\frac{x^2}{\sqrt{4 - 5x}}.$	. $2\left(1 - \frac{5x}{4}\right)^{\frac{1}{2}}$ 5 8 3 5
6	. . 1 - 0 $\frac{9}{20 - x - x^2}.$	9 3 1 1 $\frac{1}{x+5} - \frac{1}{x-4}$ 5 8 3 5
	. 2 $y = 2x, y = 2^{-2x}, y = 4$	$\approx 5{,}507$
	2 . 1 $2z = x^2 + y^2, y + z = 4$	$V = \frac{81}{4}\pi$
	+ $I = \iiint_D 15\left(y^2 + z^2\right)dxdydz$ 2 . $z = x + y,$ $x + y = 1, x = 0, y = 0, z = 0$	
4	+ 2 1 . 1 $z = y^2 - x^2, z = 0, y = \pm 2$	$V = \frac{32}{3}$

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44	$\oint_C (x+y)\,dx+(x-y)\,dy$. $x^2+y^2=4$	
4	$I=\iiint_G \frac{dx\,dy\,dz}{(x+y+z+1)^3}$ 2 . $x+z=3,\ y=2,\ x=0,\ y=0,\ z=0$	$\frac{4\ln 2-1}{8}$
4	$I=\iint_D \rho\, sin\varphi\, d\rho\, d\varphi$ 2 H $\rho=2+cos\varphi\ u\ \rho=1$	
47	$\int_L \frac{y-1}{x}dx+\frac{x+1}{y}dy$ 2 3 . (4 4, (,	$\frac{6-\ln 3}{2}$
4	$I=\int_L \left(4\sqrt[3]{x}\middle\|-e\sqrt{y}\right)dl$ 2 (34 , (4, . .	$-5\sqrt{2}$
46	. E 2 . 1 H $z=y^2,\ y=1-x,\ x=0,\ y=0,\ z=0$	$V=\frac{1}{12}$
4	0 2 . 1 H $x+y+z=a\ (a>0),\ x=0,\ y=0,\ z=0$	$x_0=\frac{a}{4},\ y_0=\frac{a}{4},\ z_0=\frac{a}{4}$
4A	0 $f(x)=\cos ax$ 3 $(-\pi;\pi)$	$\frac{2\sin(a\pi)}{\pi}\left(\frac{1}{2a}+\sum_{1}^{\infty}\frac{acos(nx)}{a^2-n^2}\right)$
4	0 $f(x)=\frac{\pi}{4}$. 1 $(0;\pi)$58 . $1-\frac{1}{3}+\frac{1}{5}-\frac{1}{7}+\ldots$	$\sum_{n=1}^{\infty}\frac{\sin(2a-1)x}{2n-1}$ $\frac{\pi}{4}$

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	$(0;\pi)$. 1 $f(x)=\left\{x, 0<x\le\frac{\pi}{2},\right.$	$\sum_{n=1}^{\infty} b_n \sin(nx)$, $b_{2k}=(-1)^{k-1}\frac{1}{2k}$ $b_{2k+1}=(-1)^{k}\frac{2}{\pi(2k+1)^2}$
4	0 $f(x)=x^2$ $(-\pi;\pi)$	$x^2=\frac{\pi^2}{3}-4\sum_{n=1}^{\infty}(-1)^{n-1}\frac{\cos(nx)}{n^2}$

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