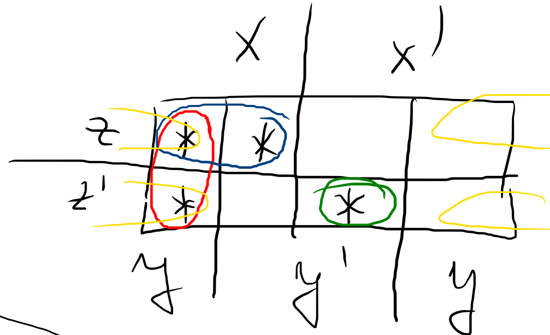
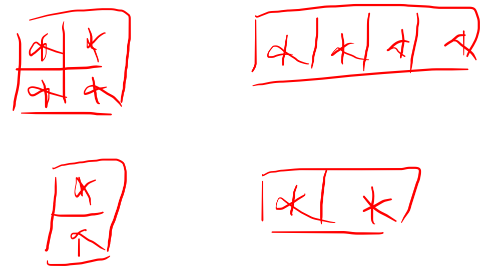
1.

$$f(x,y,z) = xyz + xy'z + xyz' + x'y'z'$$

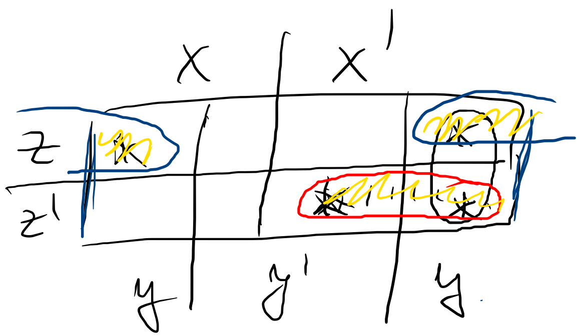




PI: xy, xz, $x'y'z'$

$$MDNF(f) = xy + xz + x'y'z'$$

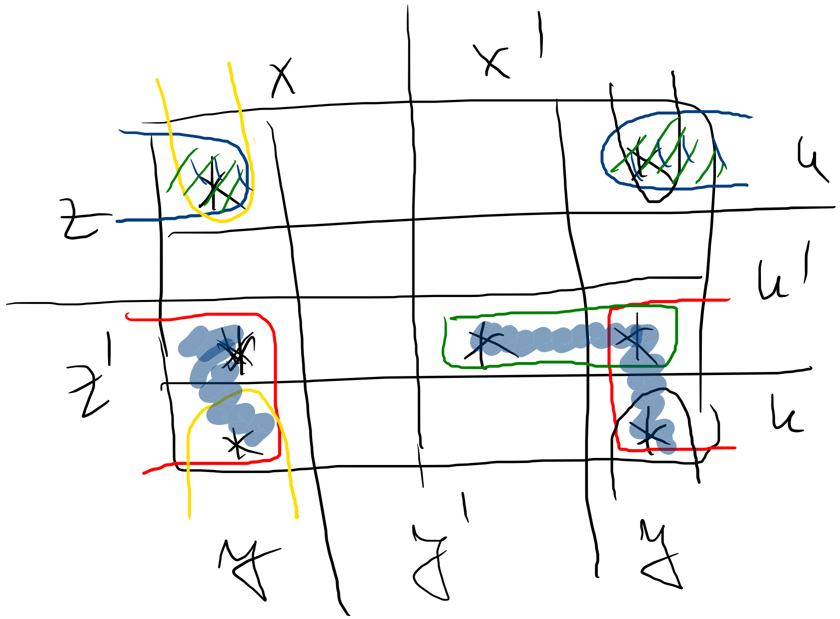
2.

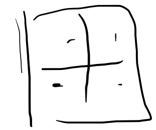


PI: $x'y$, $x'z'$, yz

$$MDNF(f) = x'z' + yz$$

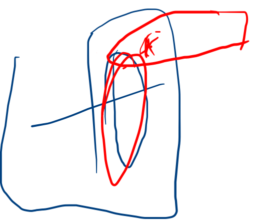
③





PI: yz', yzu, $x'z'u'$, xyu, $x'yu$

$$MDNF(f) = yz' + x'z'u' + yzu$$



(4)

$*$	a	b	c
a	a	b	c
b	b	b	a
c	c	a	c

$G = \{a, b, c\}$

$(a * b) * c = a * (b * c)$

$(a * b) * c = b * c = a$ ✓

$a * (b * c) = a * a = a$

$(c * a) * b = c * b = a$ ✓

$c * (a * b) = c * b = a$

5

$$f(x) = \ln \frac{1}{1+x^2} \qquad f: A \to B$$

$$\frac{1}{1+x^2} > 0 \quad ✓$$

$$\boxed{A = \mathbb{R}}$$

$$\frac{1}{2} = x \Rightarrow 1 = 2 \cdot x$$

$$2 = \frac{1}{x}$$

$$f(1) = \ln \frac{1}{2}$$

Nije „1-1"

$$f(-1) = \ln \frac{1}{2}$$

$$y = \ln \frac{1}{1+x^2}$$

$$\frac{1}{1+x^2} = e^y \Rightarrow 1 = e^y(1+x^2)$$

$$1 + x^2 = \frac{1}{e^y}$$

$$x^2 = \frac{1}{e^y} - 1$$

$$x^2 = \frac{1-e^y}{e^y}$$

$$\boxed{x = \pm\sqrt{\frac{1-e^y}{e^y}}}$$

$$\frac{1-e^y}{e^y} \geq 0 \qquad e^y > 0$$

$$1 - e^y \geq 0$$

$$e^y \leq 1$$

$$e^y \leq e^0$$

$$y \leq 0$$

$$B = (-\infty; 0]$$

⑥ $$\int \frac{x^2}{\sqrt{1-x-3x^2}}\,dx = (Ax+B)\cdot\sqrt{1-x-3x^2} + \lambda\int\frac{1}{\sqrt{1-x-3x^2}}\,dx \quad /'$$

$$\frac{x^2}{\sqrt{1-x-3x^2}} = A\sqrt{1-x-3x^2} + (Ax+B)\frac{1}{2\sqrt{1-x-3x^2}}\cdot(-1-6x)+\lambda\frac{1}{\sqrt{1-x-3x^2}} \quad /\sqrt{1-x-3x^2}$$

$$x^2 = A(1-x-3x^2)+(Ax+B)\,\frac{1}{2}(-1-6x)+\lambda \quad /2$$

$$2x^2 = 2A - 2Ax - 6Ax^2 - Ax - 6Ax^2 - B - 6Bx + \lambda$$

$$2x^2 = -12Ax^2 + (-3A-6B)x + 2A - B + \lambda$$

$-12A = 2$ $\qquad$ $-3A-6B=0$ $\qquad$ $2A-B+\lambda=0$

$\boxed{A = -\frac{1}{6}}$ $\qquad$ $\boxed{B = \frac{1}{12}}$ $\qquad$ $\boxed{\lambda = \frac{1}{12}+\frac{4}{12} = \frac{5}{12}}$

$$\int \frac{x^2}{\sqrt{1-x-3x^2}}\,dx = \left(-\frac{1}{6}x+\frac{1}{12}\right) + \frac{5}{12}\boxed{\int \frac{1}{\sqrt{1-x-3x^2}}\,dx}$$

$$1-x-3x^2 = -3\left(x^2+\frac{1}{3}x-\frac{1}{3}\right)$$

$$= -3\left(\underbrace{x^2+2\cdot x\cdot\frac{1}{6}+\frac{1}{36}}-\frac{1}{36}-\frac{1}{3}\right)$$

$$= -3\left(\left(x+\frac{1}{6}\right)^2-\frac{13}{36}\right)$$

$$= 3\left(\frac{13}{36}-\left(x+\frac{1}{6}\right)^2\right)$$

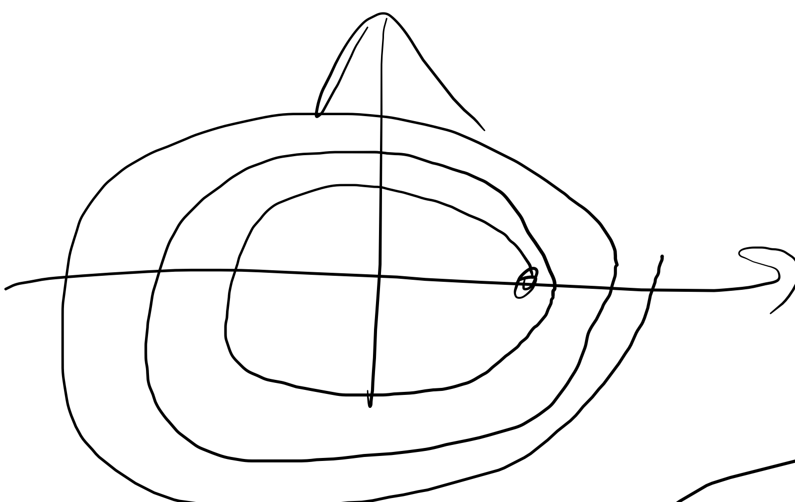
$$\int \frac{1}{\sqrt{1-x-3x^2}}\,dx = \int \frac{dx}{\sqrt{3\left(\frac{13}{36}-\left(x+\frac{1}{6}\right)^2\right)}} = \frac{1}{\sqrt{3}}\int \frac{dt}{\sqrt{\frac{\sqrt{13}}{6}-t^2}} = \frac{1}{\sqrt{3}}\arcsin\frac{t}{\frac{\sqrt{13}}{6}}+C$$

$$x+\frac{1}{6}=t \quad dx=dt$$

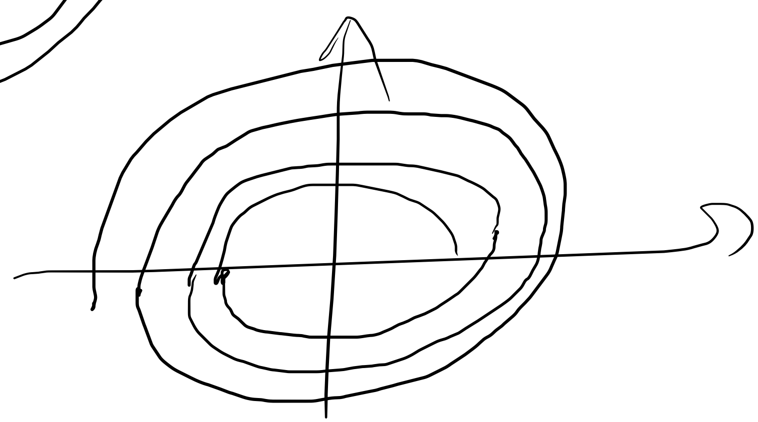
$$64e^{-5\pi i} = 64e^{-\pi i} = 64e^{\pi i}$$

$$64e^{8\pi i} = 64$$

$$e^{16\pi i} = e^{0} = 1$$



$$e^{-5\pi i} = e^{-\pi i}$$



$\frac{0}{0}, \frac{\infty}{\infty}$

$$\lim_{x \to x_0} \frac{f(x)}{g(x)} = \lim_{x \to x_0} \frac{f'(x)}{g'(x)}$$

$0 \cdot \infty$

$$\lim_{x \to 0} \underline{x \cdot \ln x} = \lim_{x \to 0} \frac{\ln x}{x^{-1}} \overset{\frac{\infty}{\infty}}{=} \lim_{x \to 0} \frac{\frac{1}{x}}{-\frac{1}{x^2}} = 0$$

$\infty - \infty$

$$\lim_{x \to 0} \left(\frac{1}{x} - \frac{1}{\sin x}\right) \overset{\infty-\infty}{=} \lim_{x \to 0} \frac{\sin x - x}{x \sin x} \overset{\frac{0}{0}}{=}$$

$1^\infty, 0^0, \infty^0$: $\boxed{\lim_{x \to 0} (\sin x)^x = A} \Big/ \ln$

$$\ln A = \ln \lim_{x \to 0} (\sin x)^x = \lim_{x \to 0} \ln(\sin x)^x = \lim_{x \to 0} x \ln(\sin x) \overset{0\cdot\infty}{=} \lim_{x \to 0} \frac{\ln(\sin x)}{\frac{1}{x}} = \lim_{x \to 0} \frac{\frac{\cos x}{\sin x}}{-\frac{1}{x^2}}$$

$y = \frac{x}{x-2}$

1) D: $x-2 \neq 0$

$x \neq 2$

$D = \mathbb{R} \setminus \{2\}$

2) $y=0 \quad x=0$

$x=0 \quad y=0$

3) $y>0$

$\frac{x}{x-2} > 0$

		0	2
x	$-$	$+$	$+$
$x-2$	$-$	$-$	$+$
	$+$	$-$	$+$

$y>0 \quad x \in (-\infty, 0) \cup (2, +\infty)$

$y<0 \quad x \in (0, 2)$

4) n-n

5) V.A.

$\lim_{x \to 2^-} \frac{x}{x-2} = \frac{2}{0^-} = -\infty$

$\lim_{x \to 2^+} \frac{x}{x-2} = \frac{2}{0^+} = +\infty$

$\Big\}$ $x=2$ V.A.

H.A.

$\lim_{x \to \pm\infty} \frac{x}{x-2} = \lim_{x \to \pm\infty} \frac{1}{1} = 1$

$y=1$ je H.A.

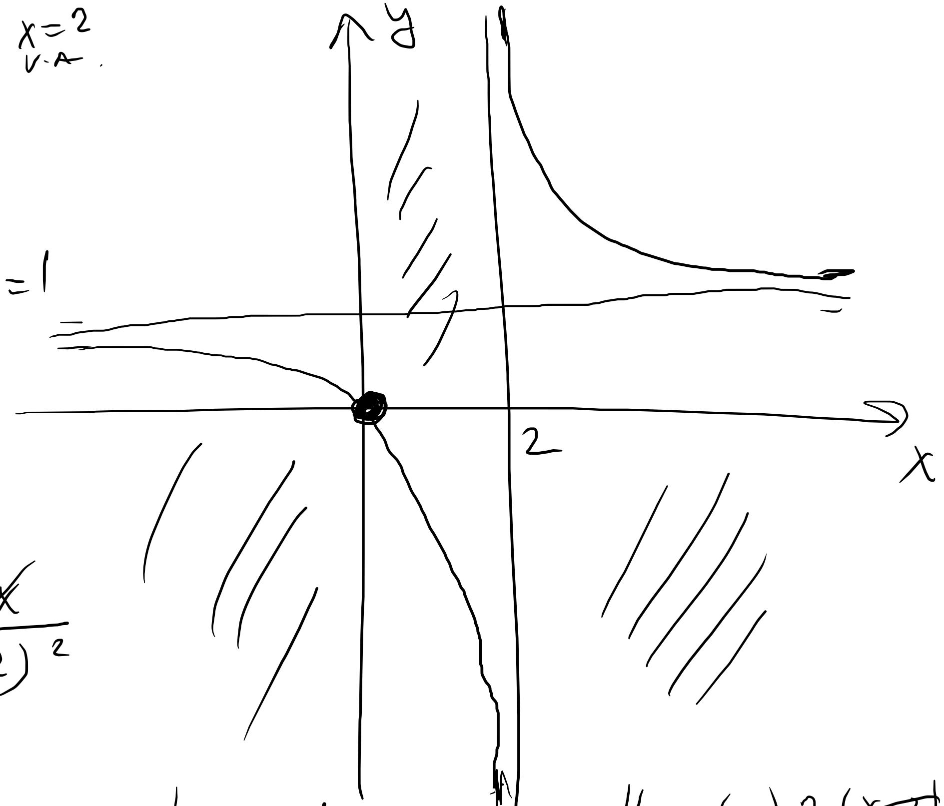
K.A. nema jer ima H.A

6) $y' = \frac{\cancel{x}-2-\cancel{x}}{(x-2)^2}$

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

$y' \neq 0 \quad \forall x \in \mathbb{R}$

nema ekstremne vrednosti



$y' < 0 \quad \forall x \in \mathbb{R}$

$y \searrow$

7) $y'' = \frac{-(-2)\,2\,\cancel{(x-2)}}{(x-2)^{\cancel{4}\,3}}$

$= \frac{4}{(x-2)^3}$

$y'' \neq 0 \quad \forall x \in \mathbb{R}$

nema prevojne ~~tačke~~

$x-2>0 \quad y''>0$

$x>2 \quad \cup$, $x<2$, $y''<0 \; \cap$