

Matematika A1 - eniwi' 2. kyslen

(Dabi' julleeg a problemu' &amp; opal'manu')

1. Opal'manu' gonionel'icigil' funbee'a) uoc'ibnele grafy funbee'  $f(x)$ , ba'e

$$f(x) = : \sin x, \cos x, \sin \frac{x}{2}, \cos 2x, \cos(x + \pi) \\ |\sin x|, |\sin |x||, \cos |x|, \sqrt{1 - \sin^2 x};$$

b) potole se odoband (a uoc'iband) grafy

$$f(x) = : \sin(x^2), \sin \frac{1}{x}, \frac{1}{\sin x}, \frac{1}{1 + \sin x}, \frac{1}{2 + \sin x}$$

2. Xyabuyile defini'e t'p'uu':Funbee' lida', ude', jee'idil'ika', kot'mee', el'aa'f'aa',  
num'mee', uel'ee'f'aa' uo  $\mathbb{N} \subset \mathbb{R}$ .3. Problem'uu':a)  $j$ -li' & lida' funbee' a  $O \in D_f$ , jae  $f(O) = 0$ .b)  $j$ -li' & kot'mee' (reop. el'ee'f'aa') funbee' uo  $(a, b)$ ,  
jae  $j$  & uo  $(a, b)$  jee'tal' (a jee'g uo  $(a, b)$ )  
ee'ileeg' & funbee' & funbee' i'ime'ee'uu'.c) J'uu'p'ile, kaa' kaa' & num'mee' d'om (i'nee')  
funbee' od'otit' num'mee' funbee' a uicil' ee'aa'ne'  
(potol'  $j$  ee' ee'aa'ne' funbee' defini'aa'e). Potole se  
ee' u'j'ee'neeg' fun'mee'at' u'p'ile'e'.4. Uleale' l'ee' u'wi' ee'ime'e), u'e' funbee'  $f(x) = x^2$   
j' kot'mee' uo  $(0, +\infty)$  a uel'ee'f'aa' uo  $(-\infty, 0)$ .

5. Kojdite aproximativni intervaly, ve kterych jsou tyto  
monotonni funkce:

$$\frac{1}{1+x^2}; \quad e^{-x^2}; \quad \frac{e^x - e^{-x}}{2} \quad (= \sinh x), \quad \frac{e^x + e^{-x}}{2} \quad (= \cosh x)$$

("more", je funkce  $e^x$  je klesajici na  $\mathbb{R}$ ).

6. Kojdite a aproximativne definicni obry funkce!

$$f(x,y) = \sqrt{x^2 + y^2}; \quad f(x,y) = \ln(\sqrt{y+1} - x).$$

Nez a aproximativne a numericky ktere:

7. a) Nez, ve jakem (V, W jsou vektorovy):

$$(V \Rightarrow W) \Leftrightarrow (\neg W \Rightarrow \neg V) \Leftrightarrow (\neg V \vee W) \Leftrightarrow \neg(V \wedge \neg W).$$

b) Ukazuje a) pro  $V: x \in A$  a  $W: x \in B$ ,

$A, B$  jsou mnoziny,  $A \subset M, B \subset M$ .

8. Ukazuje a aproximativne hodnoty: (je funkce)

a)  $\forall x \in (a,b): |f(x)| \leq 1$

b)  $\exists \epsilon > 0 \forall x \in (a,b): |f(x)| \leq \epsilon$

c)  $\forall \epsilon > 0 \forall x \in (a,b): |f(x)| \leq \epsilon$

d)  $\forall \epsilon > 0 \exists x \in (a,b): |f(x)| \leq \epsilon$

9. Ukazuje  $A, B \subset \mathbb{R}, A = \{a \in \mathbb{R}; |a-1| < 2\}, B = \{b \in \mathbb{R}; |b+2| \geq 2\}$ ,  
Kojdite mnoziny  $A \cup B; A \cap B; A \setminus B; B \setminus A; A \times B$ .

10.

Maate, jē plah! (  $A, B, C$  jīm mardz ) :

$$A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$$

$$A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$$

$$(A \setminus B) \cup (B \setminus A) = (A \cup B) \setminus (A \cap B)$$

$$A \setminus (B \cap C) = (A \setminus B) \cup (A \setminus C)$$

$$A \setminus (B \cup C) = (A \setminus B) \cap (A \setminus C)$$

11.

Analizīte' gēme hie - mī opārnac' lēnq ;

apēlūcīc' dēfīnīc' ( a rēfīnīc' ) stālcīnīc' lēn  
a nēllānīc' lēn sūc' nēllānīc' n  $\mathbb{R}^3$ .