#

①

	inf	min	max	sup
a)	1	1	x	~~∞~~
b)	0	x	2	2
c)	0	x	x	1
d)	2	2	x	~~∞~~
e)	~~-∞~~	x	x	~~-∞~~
f)	$-9/2$	x	x	$9/2$
g)	0	0	x	1
h)	0	0	1	1
i)	-1	-1	1	1
j)	~~-∞~~	x	x	~~∞~~

2) mapf. $(0,1) \to \mathbb{R}$

4 Supremum a infimum, maximum a minimum (výsledky)

Výsledky úlohy 1.

a) $\sup A = 1$, $\inf A = 0$, maximum ani minimum neexistují;

b) $\max B_1 = \sup B_1 = 1$, $\min B_1 = \inf B_1 = -1$,
$\max B_2 = \sup B_2 = 1$, $\min B_2 = \inf B_2 = -1$,
$\max B_3 = \sup B_3 = 1$, $\inf B_3 = 0$, minimum neexistuje,

c) $\sup C_1 = \infty$, $\inf C_1 = -\infty$, maximum ani minimum neexistují,
$\sup C_2 = \infty$, $\min C_2 = \inf C_2 = 3$, maximum neexistuje,
$\max C_3 = \sup C_3 = 0$, $\inf C_3 = -\infty$, minimum neexistuje,

d) $\sup D_1 = 1$, $\inf D_1 = -1$, maximum ani minimum neexistují,
$\sup D_2 = 1$, $\min D_2 = \inf D_2 = \frac{1}{2}$, maximum neexistuje,
$\max D_3 = \sup D_3 = 0$, $\inf D_3 = -1$, minimum neexistuje,

e) $\max E_1 = \sup E_1 = \frac{5}{6}$, $\inf E_1 = 0$, minimum neexistuje,
$\sup E_2 = \infty$, $\inf E_2 = 0$, maximum ani minimum neexistují,

f) $\sup F = \infty$, $\inf F = 0$, maximum ani minimum neexistují,

g) $\max G_1 = \sup G_1 = 1$, $\inf G_1 = -1$, minimum neexistuje,
$\sup G_2 = 1$, $\min G_2 = \inf G_2 = 0$, maximum neexistuje,
$\max G_3 = \sup G_3 = 1$, $\inf G_3 = -1$, minimum neexistuje.

Výsledky úlohy 2.

a)	$\sup A \cup B = \max\{s_A, s_B\}$,	$\inf A \cup B = \min\{i_A, i_B\}$,
b)	$\sup A \cap B \leq \min\{s_A, s_B\}$,	$\inf A \cap B \geq \max\{i_A, i_B\}$,
c)	$\sup A \setminus B \leq s_A$,	$\inf A \setminus B \geq i_A$,
d)	$\sup A \triangle B \leq \max\{s_A, s_B\}$,	$\inf A \triangle B \geq \min\{i_A, i_B\}$,
e)	$\sup(-A) = -i_A$,	$\inf(-A) = -s_A$,
f)	$\sup A + B = s_A + s_B$,	$\inf A + B = i_A + i_B$,
g)	$\sup A - B = s_A - i_B$,	$\inf A - B = i_A - s_B$,
h)	$\sup A \cdot B = \max\{s_A s_B, s_A i_B, i_A s_B, i_A i_B\}$,	$\inf A \cdot B = \min\{s_A s_B, s_A i_B, i_A s_B, i_A i_B\}$.

Výsledky úlohy 3.

a)	$\sup M \leq s_f + s_g$,	$\inf M \geq i_f + i_g$,
b)	$\sup N \leq s_f - i_g$,	$\inf N \geq i_f - s_g$,
c)	$\sup O \leq \max\{s_f s_g, s_f i_g, i_f s_g, i_f i_g\}$,	$\inf O \geq \min\{s_f s_g, s_f i_g, i_f s_g, i_f i_g\}$,
d)	$\sup P = \max\{\lvert s_f\rvert, \lvert i_f\rvert\}$,	$0 \leq \inf P \leq \min\{\lvert s_f\rvert, \lvert i_f\rvert\}$,
e)	$\sup Q \leq \min\{s_f, s_g\}$,	$\inf Q = \min\{i_f, i_g\}$,
f)	$\sup R = \max\{s_f, s_g\}$,	$\inf R \geq \max\{i_f, i_g\}$.

(3)

(1) (a) 3
(b) 5
(c) 2
(d) 4
(e) 6
(f) 6
(g) 1
(h) 1

(4)

(2) (a) $\frac{\pi}{6}$ (b) $-\frac{\pi}{3}$ (c) 0 (d) $\frac{\pi}{2}$ (d) $\frac{\pi}{3}$ (f) $-\frac{\pi}{3}$ (e) $-\frac{\pi}{4}$ (h) $\frac{\pi}{3}$

(5) (3) $\sin x = \frac{1}{2}$

$x_1 = \frac{\pi}{6}$

$x_2 = \frac{5}{6}\pi$

alles $x \in \{\frac{\pi}{6} + 2z\pi; z \in \mathbb{Z}\} \cup \{\frac{5}{6}\pi + 2z\pi, z \in \mathbb{Z}\}$

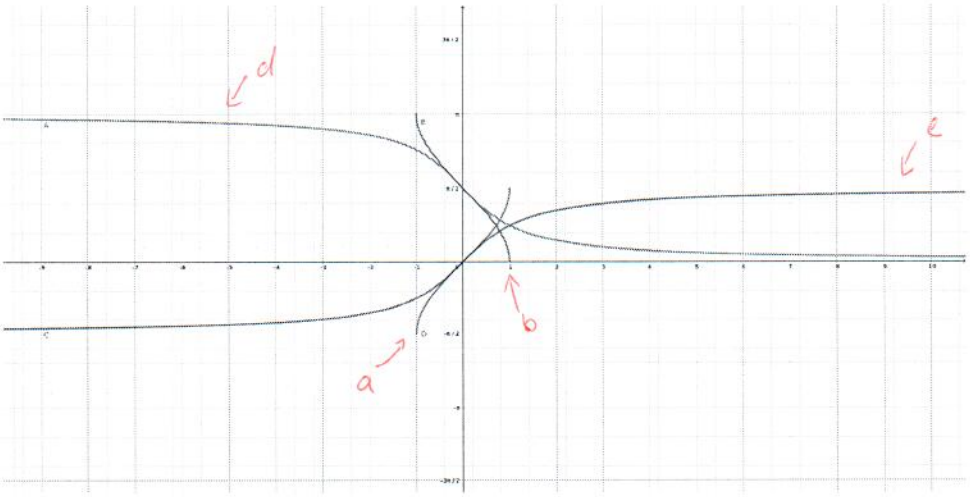
6. Najděte grafy

(a) arcsin x

(b) arccos x

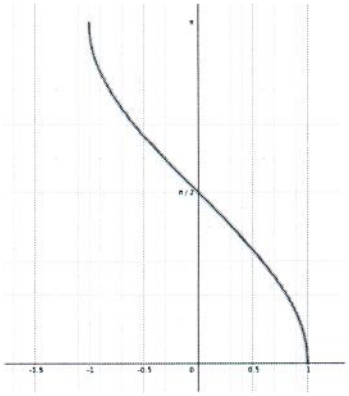
(c) arctan x

(d) arccot x



7. Který předpis patří k obrázku?

všechny



A arccos x

B $|\arccos x|$

C $\frac{\pi}{2} - \arcsin x$

D $\pi - \arccos(-x)$

8. Najděte pravdivé výroky

ANO–NE $\arcsin(\sin \frac{\pi}{6}) = \frac{\pi}{6}$

ANO–NE $\sin(\arcsin \frac{\pi}{6}) = \frac{\pi}{6}$

ANO–NE $\arcsin(\sin \frac{2\pi}{3}) = \frac{2\pi}{3}$ nepatří

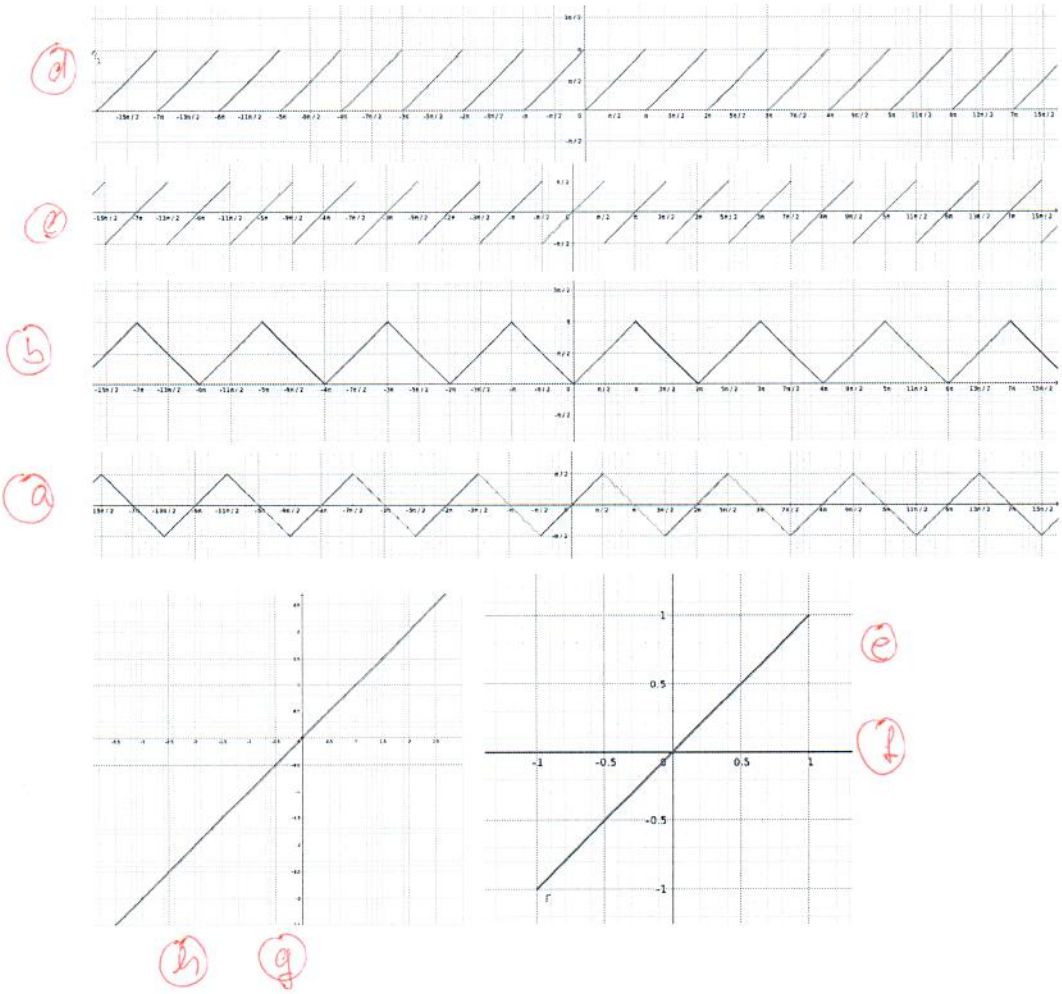
ANO–NE $\sin(\arcsin \frac{\pi}{3}) = \frac{\pi}{3}$

nedefinováno

9. Přiřaďte funkci správný graf

(a) $\arcsin(\sin x)$ (c) $\arctan(\tan x)$ (e) $\sin(\arcsin x)$ (g) $\tan(\arctan x)$

(b) $\arccos(\cos x)$ (d) $\operatorname{arcctg}(\cot x)$ (f) $\cos(\arccos x)$ (h) $\operatorname{cot}(\operatorname{arcctg} x)$



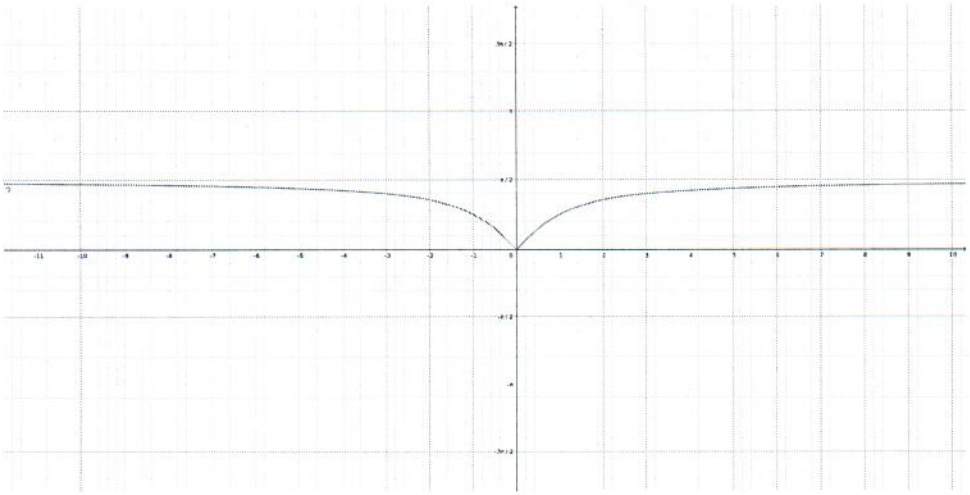
10. Najděte předpis

A $\arctan |x|$

B $\arctan -|x|$

C $|\arctan x|$

D $|\arctan(-x)|$



11. Načrtněte graf funkce $f(x) = |-\pi + 2\text{arccot}\ (x-3)|$

Function compositions

Question

Sketch the graph of $f(x) = |-\pi + 2\text{arccot}\,(x-3)|$