7/03/2022

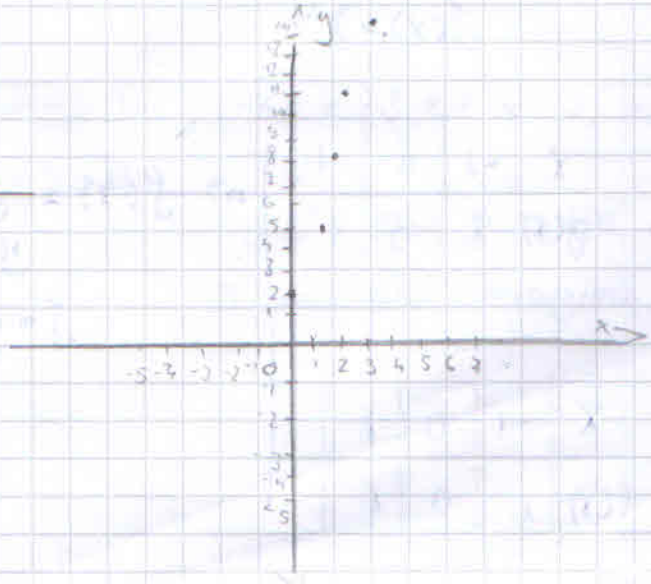
APLICAȚII *funcții*

$P: \mathbb{N} \to \mathbb{R}$

$f(x) = 3x + 2$

x	0	1	2	3	4	...
f(x)	2	5	8	11	14	...

$f(0) = 3 \cdot 0 + 2 = 2$

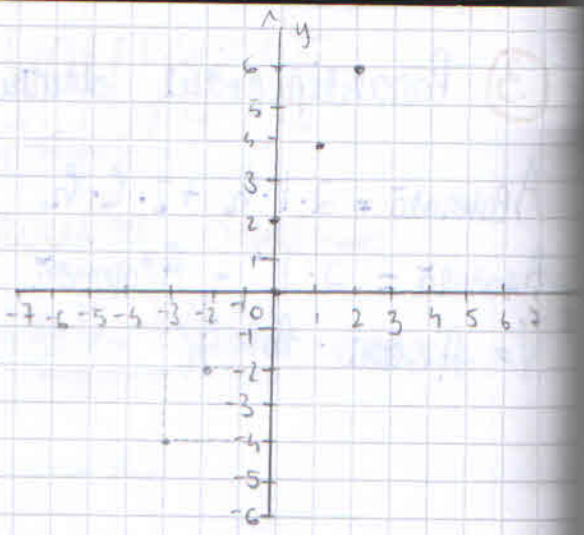


$f: \mathbb{Z} \to \mathbb{R}$

$f(x) = 2x + 2$

x	-3	-2	-1	0	1	2	...
$f(x)$	-4	-2	0	2	4	6	...

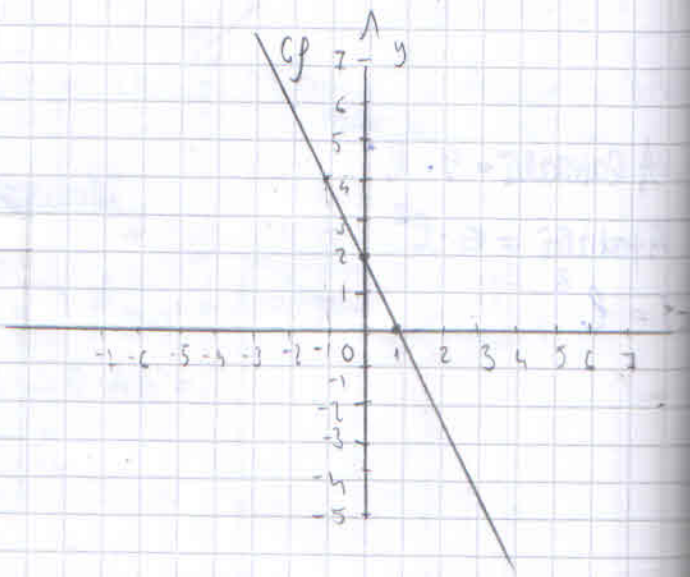
$f(-3) = 2 \cdot (-3) + 2 = -4$



$f: \mathbb{R} \to \mathbb{R}$

$f(x) = -2x + 2$

x	0	1	-1	...
$f(x)$	2	0	4	...



Functii egale

Def: Functiile $f: A \to B$ dată de relația $f(x) = y$ și functia $g: M \to N$ dată de relația $g(x) = z$, sunt egale dacă $A = M$ și $B = N$ și $f(x) = g(x)$, $(\forall) x \in$

Ex: $f: \{-1, 0, 1\} \to \mathbb{R}$, $f(x) = x^2$

$g: \{-1, 0, 1\} \to \mathbb{R}$, $g(x) = |x|$

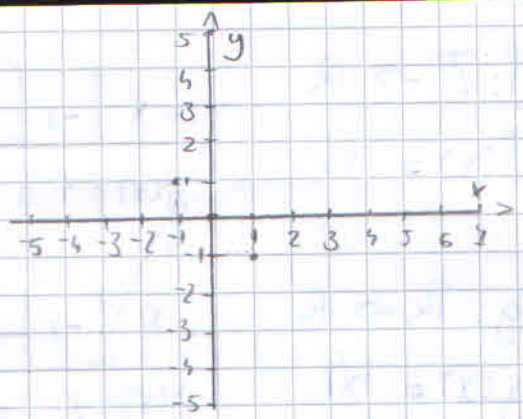
x	-1	0	1
$g(x)$	1	0	1

x	-1	0	1
$f(x)$	1	0	1

$\Rightarrow f(x) = g(x)$, $(\forall) x \in \{-1, 0, 1\}$

$\Rightarrow \dots$

$f = g$



1. $f: \mathbb{R} \to \mathbb{R}$
$f(x) = 3x - 6$

$g: \mathbb{R} \to \mathbb{R}$
$g(x) = mx + m$

$f = g$

$m = ?$ $m = ?$

Considerăm $P(0, K) \in G_f \Rightarrow f(0) = -6$
$T(1, +) \in G_f \Rightarrow f(1) = -3$

$f = g \Rightarrow f(x) = g(x)$, $(\forall)\ x \in \mathbb{R} \Rightarrow$

$\Rightarrow \begin{cases} g(0) = f(0) = -6 \\ g(1) = f(1) = -3 \end{cases} \Rightarrow \begin{cases} m \cdot 0 + m = -6 \\ m \cdot 1 + m = -3 \end{cases} \Rightarrow$

$\Rightarrow \boxed{m = -6}$ $\Rightarrow m = -3 + 6 = 3 \Rightarrow \boxed{m = 3}$

! 2. $h: \mathbb{N} \to \mathbb{R}$
$h(x) = 3x + 1$

$t: \mathbb{Z} \to \mathbb{R}$
$t(x) = mx + m$

$h = t$

$m = ?$, $m = ?$

$\mathbb{N} \neq \mathbb{Z} \Rightarrow h \neq t$ (imposibil)

! 3. $f: \mathbb{R} \to \mathbb{N}$
$f(x) = x + 1$

$g: \mathbb{R} \to \mathbb{N}$
$g(x) = mx + m$

Fie $x = -3$
$f(x) = x + 1$

$\Rightarrow f(-3) = -3 + 1 = -2$, $-2 \notin \mathbb{N}$

$\Downarrow$

f nu este funcție, pt. că -3 nu este imagine

$f: \mathbb{Z} \to \mathbb{R}$

$f(x) = |x|$

x	-1	0	1
$f(x)$	1	0	1

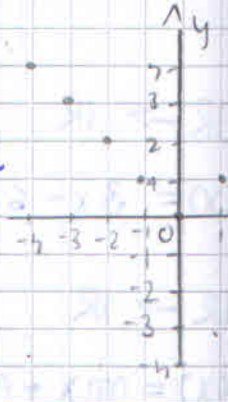
$g: \mathbb{R} \to \mathbb{R}$

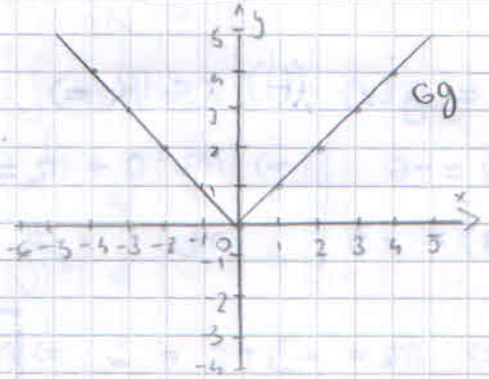
$g(x) = |x|$

x	-1	0	1
$g(x)$	1	0	1

G_f = interpretare geometrică

$(\forall) x \in \mathbb{R} \Rightarrow |x| \geq 0$





Functia de gradul I (functia liniară)

- forma generală:

$f: \mathbb{R} \to \mathbb{R}$

$f(x) = ax + b$

$(x \in \mathbb{R})$, $a \in \mathbb{R}$, $b \in \mathbb{R}$

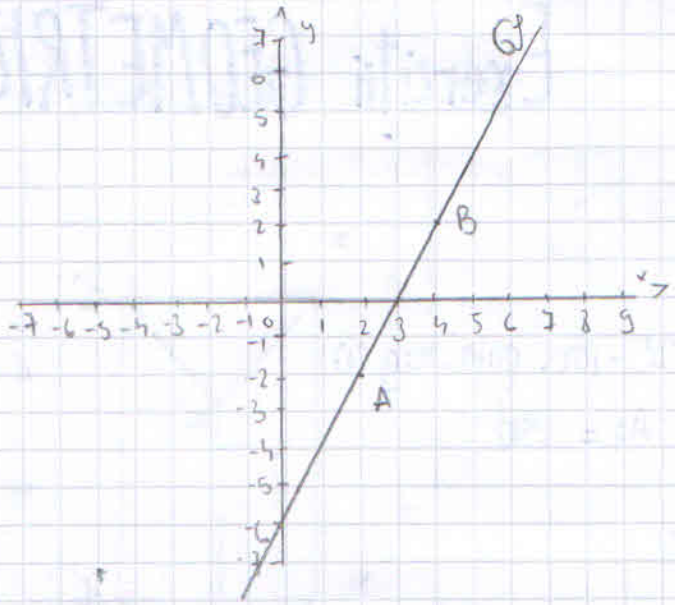
$\Downarrow$

$G_f = \{(x, f(x)) \mid x \in \mathbb{R}\} = \{(x, ax + b) \mid x \in \mathbb{R}\}$

OBS: graficul funcției de gradul I este o dreapt

- reprezentarea grafică:

x	2	4	
f(x)	-2	2	



OBS: $P(m,m) \in G_f \iff f(m) = m$

$f: \mathbb{R} \to f(x) = ax + b$, $f: \mathbb{R} \to \mathbb{R}$. $f(x) = 2x - 6$

Ex: $P(1,3) \in G_f$ (?)

$f(1) = 2 \cdot 1 - 6 = -4 \neq 3 \Rightarrow P(1,3) \notin G_f$

$Q(5,4) \in G_f$ (?)

$f(5) = 2 \cdot 5 - 6 = 4 \Rightarrow Q(5,4) \in G_f$