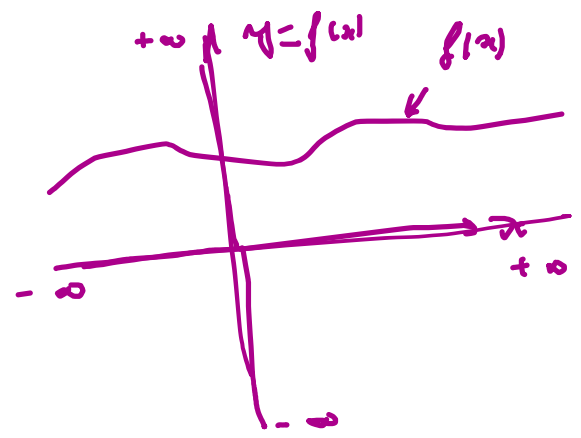


WISKUNDE : GRAFIEKEN VAN FUNCTIES

DOMEIN = x as
 BEREIK = y as



NULPUNTEN = snijpunt x as

TEKENVERLOOP $\frac{x}{f(x)}$

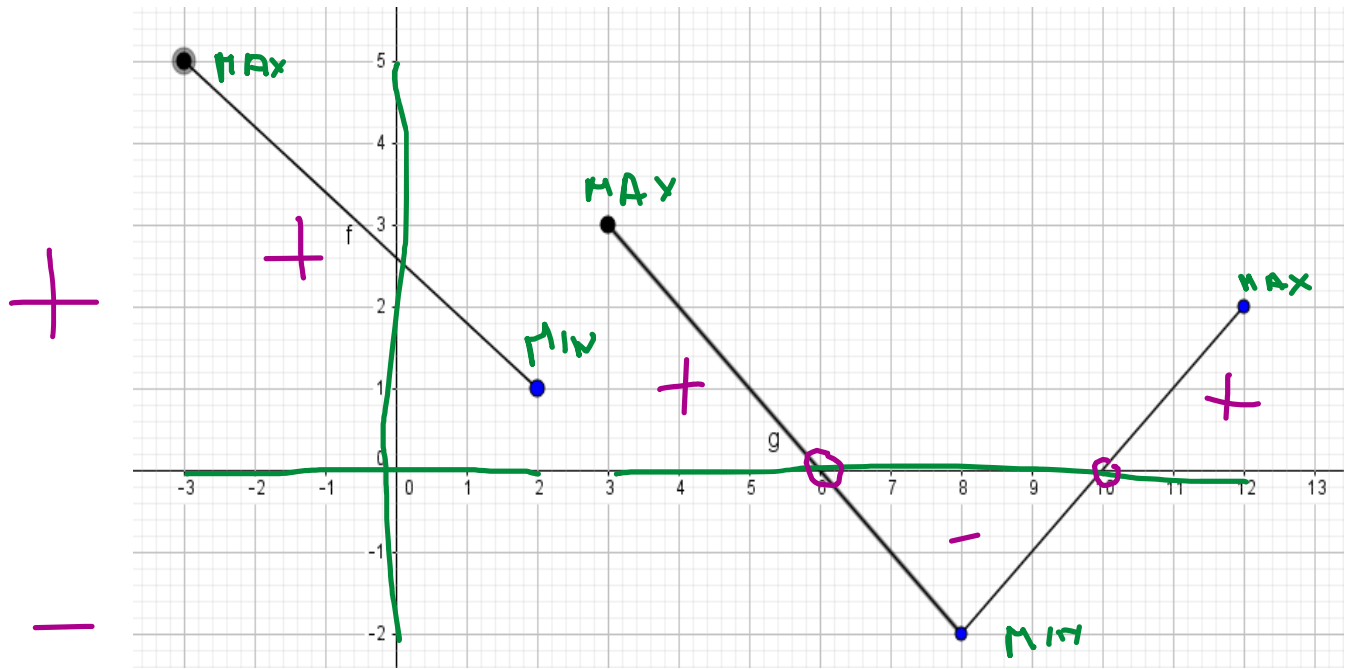
	a	b	
	+	-	
	0	0	
	+	+	

$f(x) > 0$ en $f(x) < 0$
 + -

EXTREMA = MAX MIN
 \wedge \vee

FUNCTIEVERLOOP $\frac{x}{f(x)}$

$f(x)$ stijgt en $f(x)$ daalt



Domein =

① $x \in [-3, 2] \cup [3, 12]$

Bereik =

$[-2, 5]$

② Functieverloop

x	-3	2	3	8	12
$f(x)$	5	1	3	-2	2
	MAX	MIN	MAX	MIN	MAX

$f(x)$ stijgt in $[8, 12]$
 $f(x)$ daalt in $[-3, 2] \cup [3, 8]$

Maxima en Minima

MAX $(-3, 5), (3, 3), (12, 2)$
 MIN $(2, 1), (8, -2)$

③ tekenverloop

x	-3	2	3	6	10	12					
$f(x)$	5	+	+	1	3	+	+	2			
				+	0	-	-	0	+	+	2

$f(x) > 0$ in $[-3, 2] \cup [3, 6] \cup [10, 12]$
 $f(x) < 0$ in $[6, 10]$

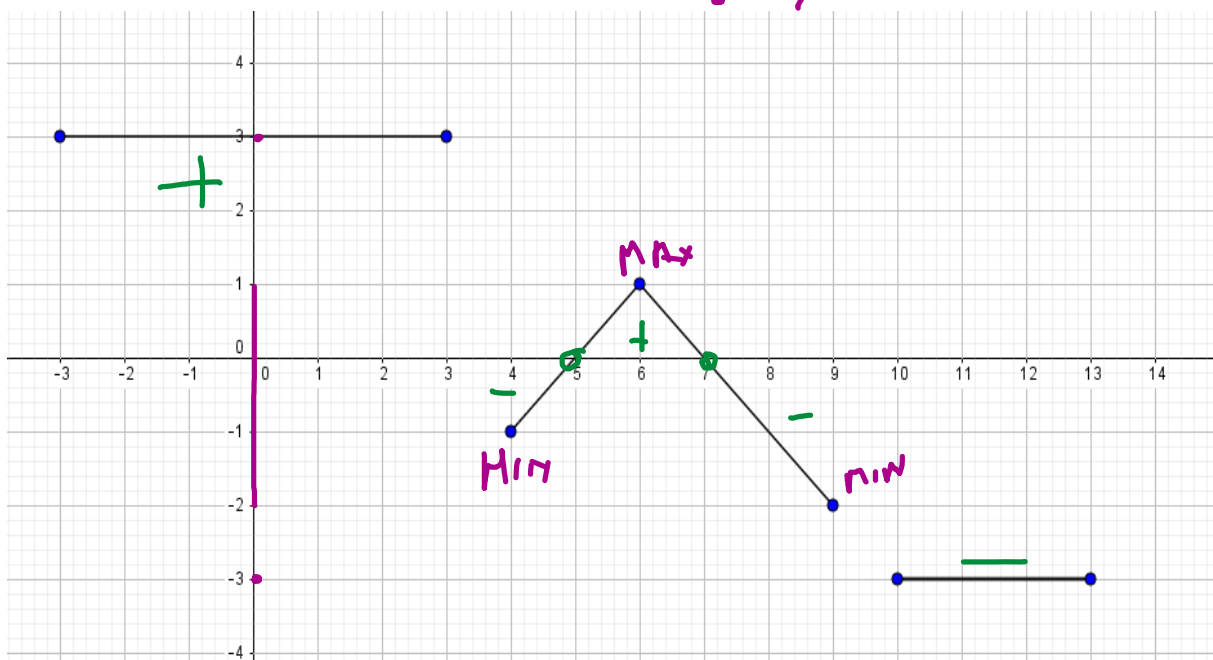
Nulpunten

$(6, 0), (10, 0)$

↔ constant ↗ ↘

+

—



① Domein = $[-3, 3] \cup [4, 9] \cup [10, 13]$ Bereik = $\{-3\} \cup [-2, 1] \cup \{3\}$

②

Functieverloop

Maxima en Minima

x	-3	3	4	6	9	10	13
$f(x)$	3	↔ 3	-1	↗ 1	↘ -2	-3	↔ -3

MAX (6, 1)
MIN (4, -1), (9, -2)

$f(x)$ stijgt in

$f(x)$ daalt in

$[4, 6]$

$[6, 9]$

③

tekenverloop

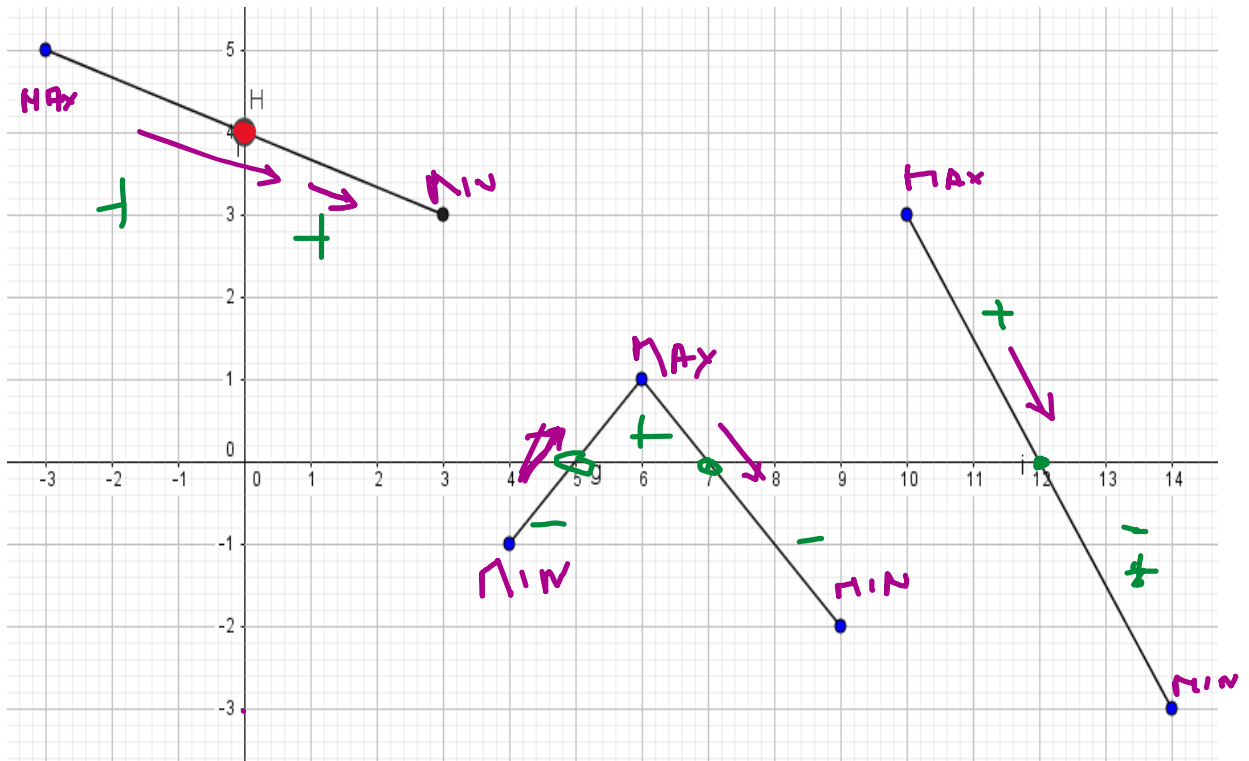
Nulpunten

$(5, 0)$ en $(7, 0)$

x	-3	3	4	5	7	9	10	13
$f(x)$	3	+	+	+	↘ -1	↘ -2	-3	↘ -3
	+ $f(x) > 0$ in			- $f(x) < 0$ in				

$[-3, 3] \cup [5, 7]$

$[4, 5] \cup [7, 9] \cup [10, 13]$



①

Domein = $[-3, 0] \cup [0, 3] \cup [4, 9] \cup [10, 14]$ Bereik = $[-3, 5] \setminus \{4\}$
 $[-3, 3] \setminus \{0\}$ $[-3, 4] \cup [4, 5]$

②

Funcieverloop



Maxima en Minima

Max $(-3, 5), (6, 1), (10, 3)$
 Min $(3, 3), (4, 1), (9, -2), (14, -3)$

x	-3	0	3 // 4	5	9 // 10	14	
f(x)	5	4	3 // 1	-1	1	-2 // 3	-3

f(x) stijgt in

$[4, 6]$

f(x) daalt in

$[-3, 0] \cup [0, 3] \cup [6, 9] \cup [10, 14]$
 $[-3, 3] \setminus \{0\}$

③

tekenverloop

Nulpunten

$(5, 0), (7, 0), (12, 0)$
 $\Rightarrow 5$ nulwaarden

x	-3	0	3 // 4	5	7	9 // 10	12	14		
f(x)	5	+	+	-	-	0	+	0	-	-

f(x) > 0 in

$[-3, 3] \setminus \{0\} \cup [5, 7] \cup [10, 12]$

f(x) < 0 in

$[4, 5] \cup [7, 9] \cup [12, 14]$