

UITWERKINGEN VOOR HET VWO A1B1 DEEL1

Hoofdstuk 1

KERN 1 FUNCTIES NOTEREN

$$1a) V_{in\ m^3} \rightarrow \boxed{\times 2,29} \rightarrow \boxed{+82,2} \rightarrow \boxed{\times 1,06} \rightarrow B$$

$$1b) 156 \rightarrow 357,24 \rightarrow 439,44 \rightarrow Hfl\ 465,81$$

$$2) r \rightarrow \boxed{\dots\dots 2} \rightarrow \rightarrow \boxed{\times 6} \rightarrow A$$

2a)

$$\begin{aligned} r = 1 &\Rightarrow A = 6 \\ r = 2 &\Rightarrow A = 24 \\ r = 3 &\Rightarrow A = 54 \\ r = 4 &\Rightarrow A = 96 \\ r = 5 &\Rightarrow A = 150 \end{aligned}$$

r	A
1	6
2	24
3	54
4	96
5	150

$$2b) A = 6 \cdot r^2$$

$$3) x \rightarrow \boxed{\times 2} \rightarrow \dots \rightarrow \boxed{-1} \rightarrow y$$

$$3a) y = 2x - 1$$

3b)

$$13 + 1 = 14$$

$$14 \div 2 = 7$$

$$4) A = 4\pi r^2$$

$$4a) r \rightarrow \boxed{\dots\dots 2} \rightarrow \dots \rightarrow \boxed{\times 4\pi} \rightarrow A$$

$$4b) A = 4\pi(4,7)^2 \simeq 277,6$$

$$4c) 4\pi r^2 = 1256,8 \Rightarrow r^2 = \frac{1256,8}{4\pi} \Rightarrow r = \sqrt{\frac{1256,8}{4\pi}} \simeq 10$$

$$5) f(x) = x^2 + 1$$

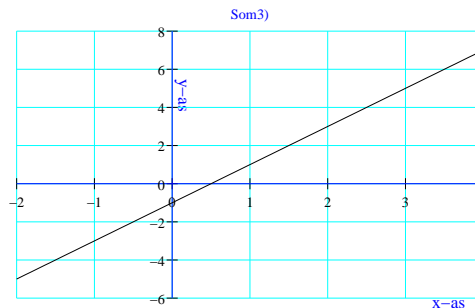
5a)

$$f(-1) = (-1)^2 + 1 \Rightarrow f(-1) = 2$$

$$f(-2) = (-2)^2 + 1 \Rightarrow f(-2) = 5$$

5b)

$$f(1) = 3^2 + 1 \Rightarrow f(1) = 10$$



¹ Deze samenvatting mag niet massaal op kosten van Schaersvoorde worden Uitgeprint!!!



² werd gemaakt onder Linux met \LaTeX en LyX

³ Typ&andere fouten&blunders graag Melden!!

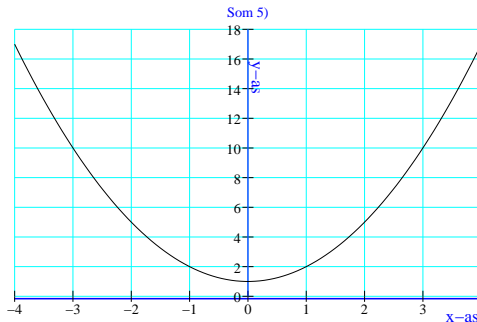
$$f(5) = 5^2 + 1 \Rightarrow f(5) = 26$$

$$f(-3) = (-3)^2 + 1 = 10$$

5c)

$$37 = x^2 + 1 \Rightarrow x^2 = 26 \Rightarrow x = 6 \vee x = -6$$

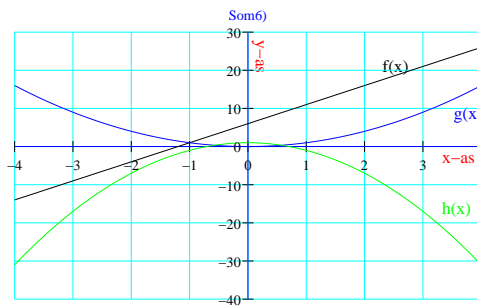
$$43 = x^2 + 1 \Rightarrow x^2 = 42 \Rightarrow x = \sqrt{42} \vee x = -\sqrt{42}$$



6a&b)

$$\left\| \begin{array}{l} f(x) = 5x + 6 \\ f(5) = 5 \cdot 5 + 6 = 31 \\ f(-1) = 5 \cdot 1 + 6 = 1 \\ f(1\frac{1}{2}) = 5 \cdot 1\frac{1}{2} + 6 = 13\frac{1}{2} \end{array} \right\| \left\| \begin{array}{l} g(x) = x^2 \\ g(-2) = (-2)^2 = 4 \\ g(4) = 4^2 = 16 \end{array} \right\| \left\| \begin{array}{l} h(x) = -2x^2 + 1 \\ h(-2) = -2(-2)^2 + 1 = -2 \cdot 4 + 1 = -7 \\ h(4) = -2 \cdot 4^2 + 1 = -2 \cdot 16 + 1 = -31 \end{array} \right\|$$

6c) $g(x) = x^2 = 3 \Rightarrow x = \sqrt{3} \vee x = -\sqrt{3}$



7a) $f(1) = 2$

7b) $g(3) = 1$

7c) $f(-1) = 4$

7d) $g(0) - f(0) = -1 - 3 = -4$

7e) $f(3) - f(2) = 0 - 1 = -1$

8a) Na 24uur herhaalt zich een identiek temperatuurverloop

8b) $20^\circ C \rightarrow T(6) = 20$

8c) $t = 132$

$$\left. \begin{array}{l} 24 * 5 = 120 \\ 132 - 120 = 12 \end{array} \right\} \rightarrow T(132) = T(12) = 19^\circ C$$

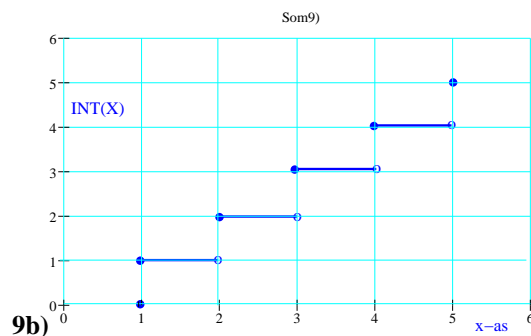
8d) Tussen 12uur 's middags en 12uur 's avonds

9a)

$INT(3\frac{1}{2}) = 3$

$INT(3) = 3$

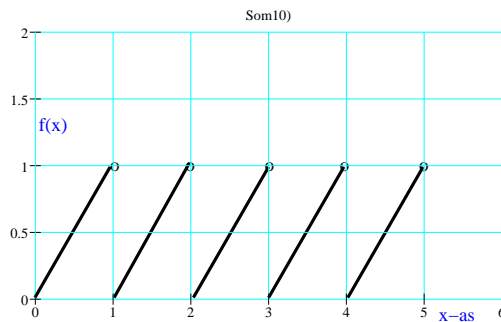
$INT(0,9) = 0$



10a) $f(x) = x - \text{INT}(x)$

x	f(x)
0	0
$\frac{1}{2}$	$\frac{1}{2}$
$\frac{3}{4}$	$\frac{3}{4}$
1	0
$1\frac{1}{2}$	$\frac{1}{2}$
$1\frac{3}{4}$	$\frac{3}{4}$
2	0
$2\frac{1}{2}$	$\frac{1}{2}$

10b)



11) $f(x) = \sqrt{x-2}$

11a) $x \rightarrow \boxed{-2} \rightarrow \text{---} \rightarrow \boxed{\sqrt{\text{---}}} \rightarrow f(x)$

11b)

$f(2) = \sqrt{2-2} = 0$

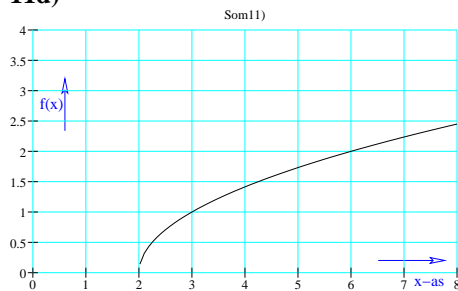
$f(3) = \sqrt{3-2} = 1$

$f(6) = \sqrt{6-2} = \sqrt{4} = 2$

11c)

$f(0) = \sqrt{0-2} = \sqrt{-2}$ bestaat niet
 $f(1) = \sqrt{1-2} = \sqrt{-1}$ bestaat niet } je kunt geen worteltrekken uit een negatief getal

11d)



11e)

$\sqrt{x-2} = 3 \xrightarrow{\text{links\&rechts kwadrateren}} x-2 = 3^2 \Rightarrow x-2 = 9 \Rightarrow x = 11$

$\sqrt{x-2} = 9 \xrightarrow{\text{links\&rechts kwadrateren}} x-2 = 9^2 \Rightarrow x-2 = 81 \Rightarrow x = 83$

12) $h = \sqrt{7225 - x^2} - 75$ (x, h in meters)

12a) $x = 0 \Rightarrow h = \sqrt{7225 - 0^2} - 75 \Rightarrow h = 85 - 75 \Rightarrow h = 10$

12b) $0 = \sqrt{7225 - x^2} - 75 \Rightarrow 75 = \sqrt{7225 - x^2} \xrightarrow{\text{links\&rechts kwadrateren}} 5625 = 7225 - x^2 \Rightarrow x^2 = 1600 \Rightarrow x = 40$

12c) Boog is $2 * 40 = 80$ meter

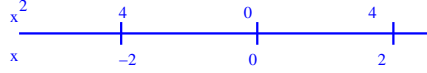
KERN 2

DOMEIN & BEREIK

13a) $4 - x^2 \geq 0 \Rightarrow 4 \geq x^2 \Rightarrow x^2 \leq 4$

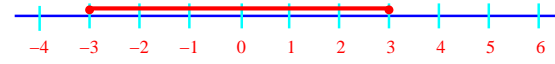
$x^2 = 4 \Rightarrow x = 2 \vee x = -2$

$x^2 \leq 4 \Rightarrow -2 \leq x \leq 2$



13b) $y_2 = \sqrt{-x^2}$

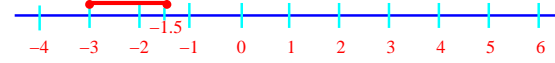
$9 - x^2 \geq 0 \Rightarrow 9 \geq x^2 \Rightarrow x^2 \leq 9$



14a) $\langle -4; 1]$

14b) $[-3; -1\frac{1}{2}]$

14c) $\langle 5; \rightarrow$



15) $f(x) = \sqrt{2-x}$

15a) $f(2) = \sqrt{2-2} = \sqrt{0} = 0$

$f(0) = \sqrt{2-0} = \sqrt{2}$

$f(-2) = \sqrt{2-(-2)} = \sqrt{4} = 2$

15b) $2-x \geq 0 \Rightarrow 2 \geq x \Rightarrow x \leq 2$

Geen functiewaarde als $x > 2$

15c) $f(x) = \sqrt{2-x} = 3 \Rightarrow 2-x = 9 \Rightarrow$

$\Rightarrow -x = 7 \Rightarrow x = -7$

15d) $f(x) = \sqrt{2-x} = 10 \Rightarrow 2-x = 100 \Rightarrow$

$\Rightarrow x = -98$

16) $f(x) = \sqrt{\frac{1}{2}x + 2}$

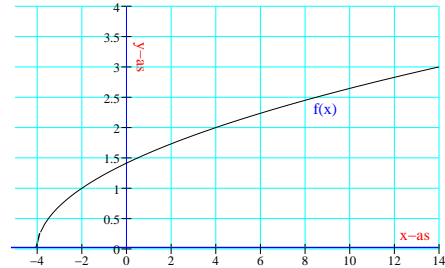
16a) $\frac{1}{2}x + 2 \geq 0 \Rightarrow \frac{1}{2}x \geq -2 \Rightarrow x \geq -4$

$D_f = [-4; \rightarrow)$

16b)

x	-4	-3	-2	-1	0	1	2	4	14
f(x)	0	$\sqrt{\frac{1}{2}}$	1	$\sqrt{1\frac{1}{2}}$	$\sqrt{2}$	$\sqrt{1\frac{1}{2}}$	$\sqrt{3}$	2	3

Som 16)



16c) $f(x) = 4 \Rightarrow \sqrt{\frac{1}{2}x + 2} = 4 \Rightarrow \frac{1}{2}x + 2 = 16 \Rightarrow$

$\Rightarrow \frac{1}{2}x = 14 \Rightarrow x = 28$

16d) $g(x) = \sqrt{\frac{1}{2}x + 2} - 4$

$\frac{1}{2}x + 2 \geq 0 \Rightarrow D_f = [-4; \rightarrow)$

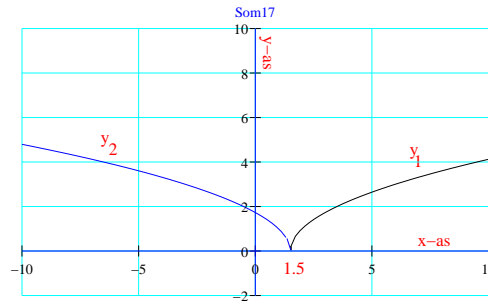
17) $y_1 = \sqrt{2x-3}$ $y_2 = \sqrt{3-2x}$

17a) $y_1 \geq 0 \Rightarrow 2x-3 \geq 0 \Rightarrow 2x \geq 3 \Rightarrow x \geq 1\frac{1}{2}$

$D_1 = [1\frac{1}{2}; \rightarrow)$

$y_2 \geq 0 \Rightarrow 3-2x \geq 0 \Rightarrow 3 \geq 2x \Rightarrow x \leq 1\frac{1}{2}$

$D_2 = \langle \leftarrow; 1\frac{1}{2}]$



18a) $2 \cdot l + 2 \cdot b = 14 \Rightarrow 2b = 14 - 2l \Rightarrow b = \frac{1}{2}(14 - 2l) \Rightarrow b = 7 - l$

18b) $O = l \cdot b \Rightarrow O = l \cdot (7 - l) \Rightarrow O = 7l - l^2$

18c) $l \geq 0$

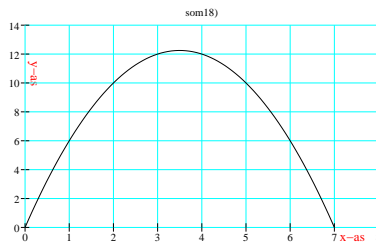
$O = 0 \Rightarrow 7l - l^2 = 0 \Rightarrow l(7 - l) = 0 \Rightarrow l = 0 \vee l = 7$

$$O = 7l - l^2 \quad \leftarrow \text{Is een Bergparabool}$$

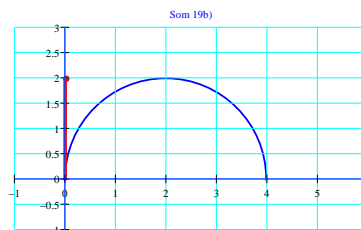
$$O \geq 0 \Rightarrow D_o = [0; 7]$$

18d)

l	0	1	$3\frac{1}{2}$	4	7
O	0	6	12,25	12	0



19a) $f(x) = 0 \quad f(x) = 2$



19b)

20a) $B_f = [1; 3]$

20b) $f(4) = 3$

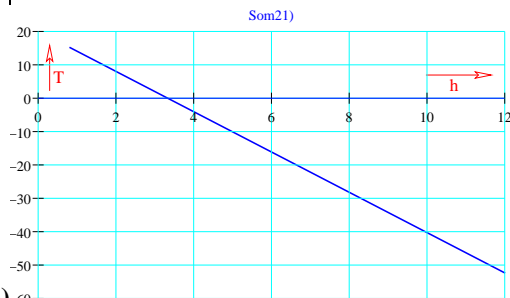
20c) $f(x) = 2 \Rightarrow x = 0 \vee x = 3 \vee x = 5$

21) $T = 20 - 6h$ (T in $^{\circ}C$, h in km)

$$1 \leq h \leq 12$$

21a)

h	1	2	3	4	6	8	10	12
T	14	8	2	-4	-16	-28	-40	-52



21b)

21c) $B_T = [-52; 14]$

21d) $20 - 6h \geq 0 \Rightarrow 20 \geq 6h \Rightarrow 6h \leq 20 \Rightarrow h \leq \frac{20}{6} \approx 3\frac{1}{3}$

22) $O(q) = 16q - q^2$ (q is het aantal verkochte artikelen)

21a) $q \geq 0$

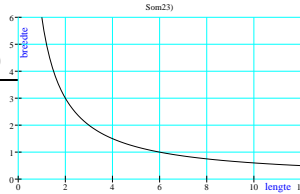
21b) $O(q) = 0 \Rightarrow 16q - q^2 = 0 \Rightarrow q(16 - q) = 0 \Rightarrow q = 0 \vee 16 - q = 0 \Rightarrow q = 0 \vee q = 16$

$$\left. \begin{array}{l} O(8) = 16 \cdot 8 - 8^2 \Rightarrow O(8) = 64 \\ O(q) \text{ is bergparabool} \end{array} \right\} \Rightarrow B_o = \langle \leftarrow; 64 \rangle$$

KERN 3 ASYMPTOTEN

23a)

lengte (cm)	1	2	3	6	10	20	30	60
breedte (cm)	6	3	2	1	$\frac{3}{5}$	$\frac{3}{10}$	$\frac{1}{5}$	$\frac{1}{10}$



23c)

$$l = 0,5 \rightarrow l \cdot b = 6 \Rightarrow 0,5 \cdot b = 6 \Rightarrow b = 12$$

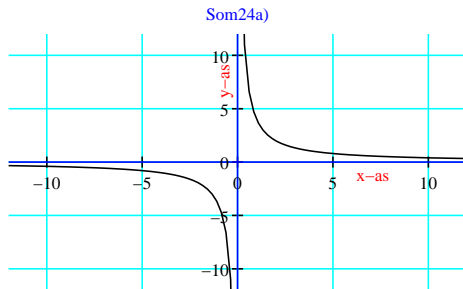
$$l = 0,25 \rightarrow 0,25 \cdot b = 6 \Rightarrow b = 24$$

23b)

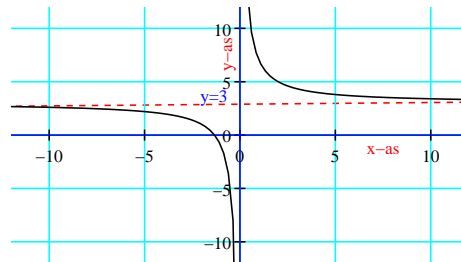
24a) $f(x) = \frac{4}{x}$

x	-8	-4	-2	-1	-0,5	-0,25		0,25	0,5	1	2	4	8
f(x)	-0,5	-1	-2	-4	-8	-16		16	8	4	2	1	0,5

Asmptoten $\rightarrow x = 0$ en $y = 0$



Som 24b)



24b) $f(x) = \frac{4}{x} + 3$

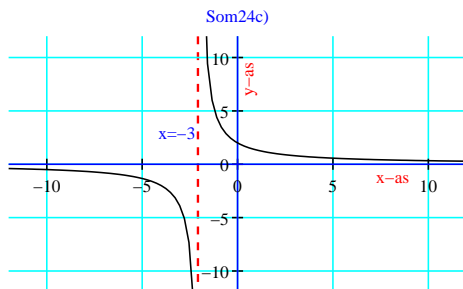
x	-8	-4	-2	-1	-0,5	-0,25		0,25	0,5	1	2	4	8
f(x)	2,5	2	1	-1	-5	-13		19	11	7	5	4	3,5

Asmptoten $\rightarrow x = 0$ en $y = 3$

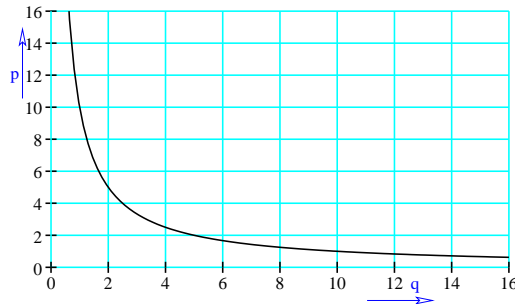
24c) $f(x) = \frac{4}{x+2}$

x	-10	-6	-4	-3	-2,5	-2,25		-1,75	-1,5	-1	-0,5	0	2	6	10
f(x)	-0,5	-1	-2	-4	-8	-16		16	8	4	$\frac{8}{3}$	2	1	0,5	3

Asmptoten $\rightarrow x = -2$ en $y = 0$



Som 25)



25) $p \cdot q = 10$ (p is de prijs in guldens...nee nog geen €'s, q is het aantal verkochte artikelen)

26) $T = \frac{200t}{t+1} + 20$ (t in uren, T in $^{\circ}C$)

26a) $t = 10 \Rightarrow T = \frac{200 \cdot 10}{10+1} + 20 \Rightarrow T = \frac{2000}{11} + 20 \Rightarrow T = 181 \frac{9}{11} + 20 \Rightarrow T = 201 \frac{9}{11} \text{ } ^{\circ}C$

26b)

$$\left. \begin{array}{l} T(100) \simeq 218,02 \\ T(1000) \simeq 219,8 \\ 220^{\circ}\text{C} \end{array} \right\| \left. \begin{array}{l} T = \frac{200t}{t+1} \cdot \frac{1}{t} + 20 \Rightarrow \\ T = \frac{200}{\frac{t+1}{t}} + 20 \Rightarrow \\ T = \frac{200}{1+\frac{1}{t}} + 20 \end{array} \right\} t \rightarrow \infty \Rightarrow \frac{1}{t} \rightarrow 0 \Rightarrow \frac{200}{1+\frac{1}{t}} \rightarrow 200$$

27a) $f(x) = \frac{3x}{x-1}$

$f(100) = \frac{300}{99} \simeq 3,0303$

$f(1000) = \frac{3000}{999} \simeq 3,003003$

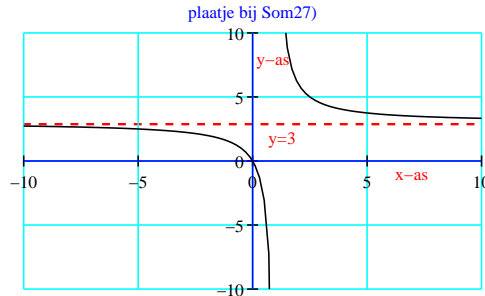
27b)

$f(-100) = \frac{-300}{-101} \simeq 2,970297$

$f(-1000) = \frac{-3000}{-1001} \simeq 2,997002997$

27c) y bijna 3

27d) $y = 3$



28) $T = \frac{20t+80}{t+1}$, T in °C en t de tijd in minuten

28a) $t = 0 \Rightarrow T = 80^{\circ}\text{C}$

28b) $t = 60 \Rightarrow T = \frac{20 \cdot 60 + 80}{60 + 1} \Rightarrow T = \frac{1280}{61} \Rightarrow T \simeq 20,98^{\circ}\text{C}$

28c) $t = 300 \Rightarrow T = \frac{20 \cdot 300 + 80}{300 + 1} \Rightarrow T \simeq 20,2^{\circ}\text{C}$

$T = \frac{20t+80}{t+1} \cdot \frac{1}{t} \Rightarrow T = \frac{\frac{1}{t}(20t+80)}{\frac{1}{t}(t+1)} \Rightarrow T = \frac{20+\frac{80}{t}}{1+\frac{1}{t}}$

De *Temperatuur* van het buitenterras is 20°C

29) $f(x) = \frac{1}{x-3}$

29a) $x = 3$

29b) $f(2,9) = \frac{1}{2,9-3} = \frac{1}{-0,1} = -10$

$f(2,99) = \frac{1}{2,99-3} = \frac{1}{-0,01} = -100$

29c) $f(3,1) = \frac{1}{3,1-3} = \frac{1}{0,1} = 10$

$f(3,01) = \frac{1}{3,01-3} = \frac{1}{0,01} = 100$

29d) De functiewaarde wordt heel groot positief als je net boven de drie zit, en heel groot negatief als je onder de drie zit

30) $f(x) = \frac{1}{2x+4}$

30a) $2x+4 = 0 \Rightarrow 2x = -4 \Rightarrow x = \frac{-4}{2} \Rightarrow x = -2$

$D_f : x \in \mathfrak{R} \setminus \{-2\}$

$x \in \mathfrak{R} \setminus \{-2\}$ betekent : x is element is van de verzameling Reële Getallen... behalve(\) $x = -2$

30b)

$f(-1,9) = 5$

$f(-1,99) = 50$

$f(-1,999) = 500$

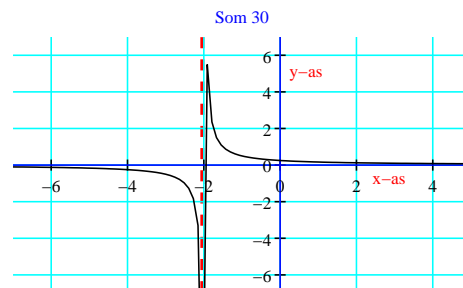
$f(-2,01) = -50$

$f(-2,001) = -500$

$f(-2,0001) = -5000$

Verticale Asymptoot $\rightarrow x = -2$

x	-4	-3	-1,5	-1,75	0
f(x)	-0,25	-0,5	1	2	0,25



31) $f(x) = \frac{4x}{2x-5}$

31a) $2x - 5 = 0 \Rightarrow 2x = 5 \Rightarrow$

$\rightarrow x = 2\frac{1}{2} \leftarrow \text{Verticale Asymptoot}$

31b)

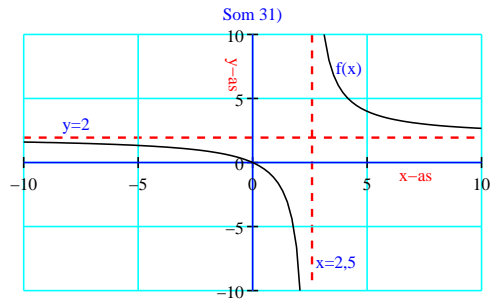
$f(100) = \frac{400}{200-5} \simeq 2,05$

$f(1000) = \frac{4000}{2000-5} \simeq 2,005$

$f(-100) = \frac{-400}{-200-5} \simeq 1,95$

$f(-1000) = \frac{-4000}{-2000-5} \simeq 1,995$

$\rightarrow y = 2 \leftarrow \text{Horizontale Asymptoot}$



31d)

x	-4	-2	-1	0	1	3	4	5
$f(x)$	1,23	0,89	0,57	0	-1,32	12	5,33	4

32) $f(x) = \frac{x}{x^2+1}$

32a) $x^2 \geq 0 \Rightarrow x^2 + 1 \geq 1 \Rightarrow x^2 + 1 \neq 0$

$D_f : x \in \mathbb{R}$

32b) Geen Verticale Asymptoot

$f(10) \simeq 0,099$

$f(100) \simeq 0,009999$

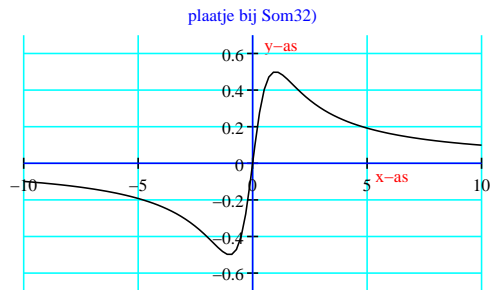
$f(1000) \simeq 0$

$f(-10) \simeq -0,099$

$f(-100) \simeq -0,009999$

$f(-1000) \simeq -0$

$y = 0 \leftarrow \text{Horizontale Asymptoot}$



32c)

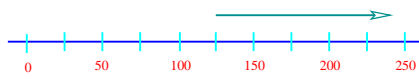
x	-3	-2	-1	0	1	2	3
$f(x)$	-0,3	-0,4	-0,5	0	0,5	0,4	0,3

Kern 4

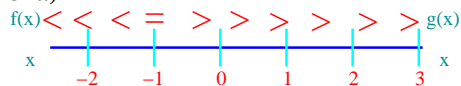
BEREIK & DOMEIN

33a) 125 km

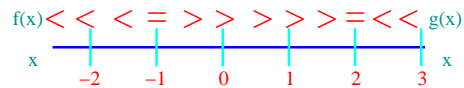
33b)



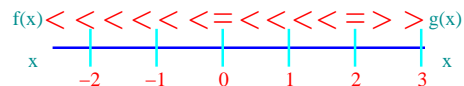
34a)



34b)



34c)



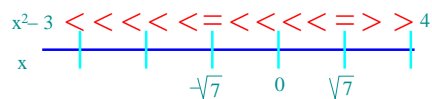
35a) $h(4) = 40 \cdot 4 - 5 \cdot 4^2 = 80$

35b) $6 - 2 = 4 \text{ seconden}$

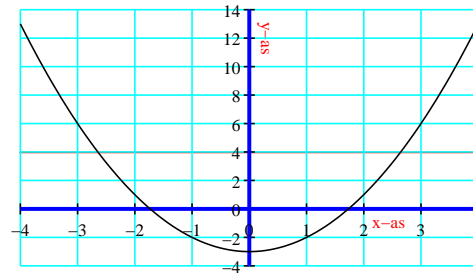
35c) $0 \leq t < 2$ en $6 < t \leq 8$

36a) $x^2 - 3 = 4 \Rightarrow x^2 = 7 \Rightarrow x = \sqrt{7} \vee x = -\sqrt{7}$

$x \leq -\sqrt{7} \vee x \geq \sqrt{7}$

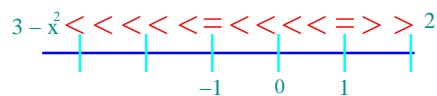


plaatje bij Som 36a)

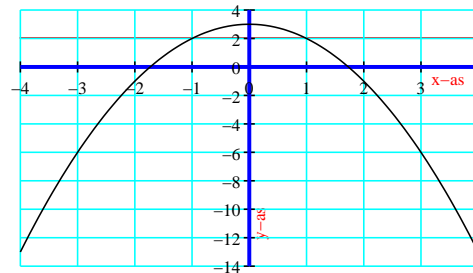


36b) $3 - x^2 = 2 \Rightarrow x^2 = 1 \Rightarrow x = 1 \vee x = -1$

$x < -1 \vee x > +1$

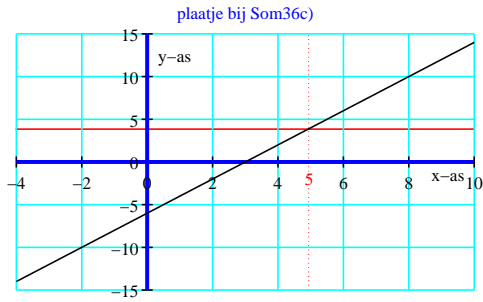
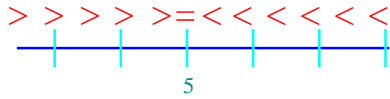


plaatje bij Som 36b)

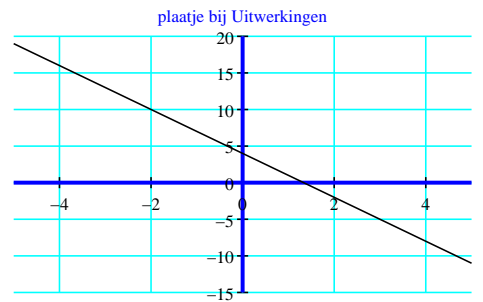
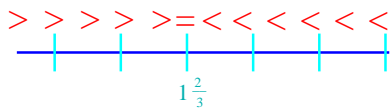


36c) $4 = 2x - 6 \Rightarrow 2x = 10 \Rightarrow x = 5$

$x > 5$



36d) $4 - 3x = -1 \Rightarrow 3x = 5 \Rightarrow x = 1\frac{2}{3}$



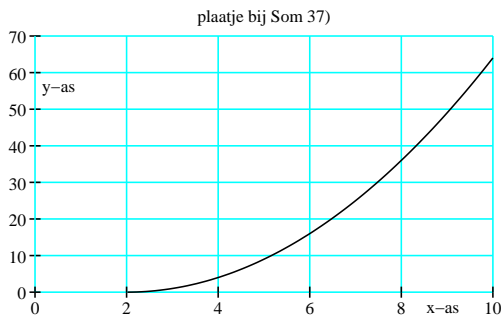
37a) $O = (x - 2)^2$

x	2	3	4	5	6
O	0	1	4	9	16

37b) $(x - 2)^2 = 12\frac{1}{4} = \frac{49}{4} \Rightarrow x - 2 = \frac{7}{2} \Rightarrow$

$\Rightarrow x = 5\frac{1}{2}$

$x > 5\frac{1}{2}$

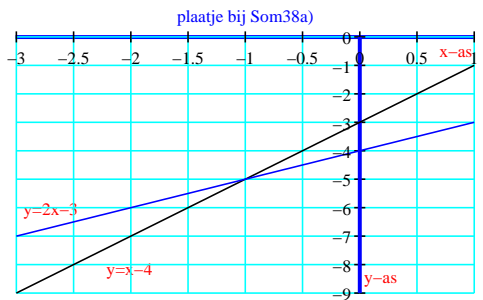
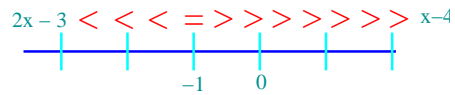


38a) $2x - 3 = x - 4 \Rightarrow x = -1$

Neem bijvoorbeeld $x = 0$ als testpunt \rightarrow

$2 * 0 - 3 > 0 - 4 \rightarrow -3 > -4$

$2x - 3 > x - 4 \Rightarrow x > -1$

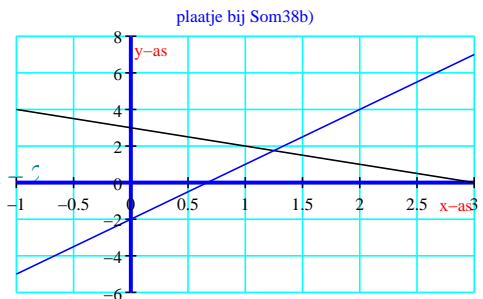
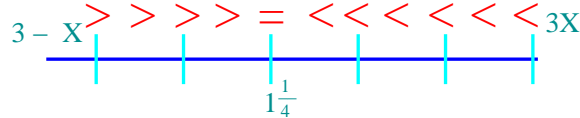


38b) $3 - x = 3x - 2 \Rightarrow 5 = 4x \Rightarrow x = \frac{5}{4} = 1\frac{1}{4}$

Neem bijvoorbeeld $x = 0$ als testpunt \rightarrow

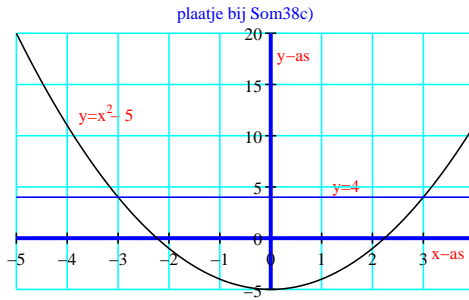
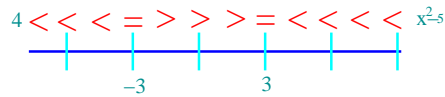
$3 - 0 > 3 * 0 - 2 \rightarrow 3 > -2$

$3 - x \leq 3x - 2 \Rightarrow x \geq 1\frac{1}{4}$



38c) $4 = x^2 - 5 \Rightarrow x^2 = 9 \Rightarrow x = 3 \vee x = -3$

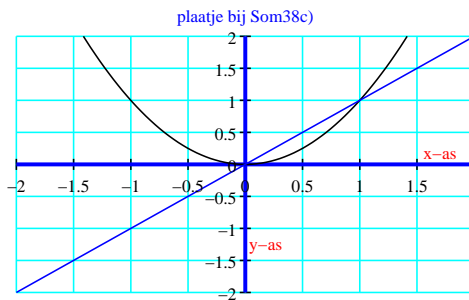
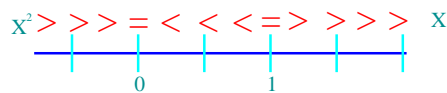
$4 < x^2 - 5 \Rightarrow x < -3 \vee x > 3$



38d) $x^2 = x \Rightarrow x^2 - x = 0 \Rightarrow x(x - 1) = 0 \Rightarrow$

$\Rightarrow x = 0 \vee x = 1$

$x^2 \geq x \Rightarrow x \leq 0 \vee x \geq 1$



39a)

$\left. \begin{matrix} (0; 0) \\ (30; 10) \end{matrix} \right\} \rightarrow 10\text{km per } 30\text{minuten} \Rightarrow \frac{10}{30}\text{km per minuut}$

$s = \frac{1}{3}t$

$0 \leq t \leq 30$

39b)

$\left. \begin{matrix} (50; 10) \\ (100; 0) \end{matrix} \right\} \rightarrow 10\text{km per } 50\text{minuten} \Rightarrow \frac{1}{5}\text{km per minuut}$

$\left. \begin{matrix} s = -\frac{1}{5}t + b \\ (50; 10) \end{matrix} \right\} \rightarrow 10 = -\frac{1}{5} \cdot 50 + b \Rightarrow b = 10 - (-10) \Rightarrow b = 20$

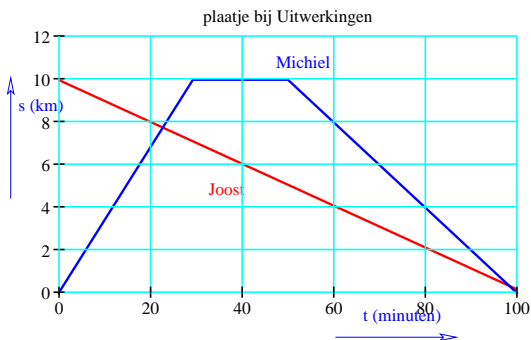
39c) $s = -\frac{1}{5}t + 20 \quad 50 \leq t \leq 100$

$\frac{1}{3}t = 10 - 0, 1t \Rightarrow \frac{1}{3}t + \frac{1}{10}t = 10 \Rightarrow$

$\Rightarrow \frac{13}{30}t = 10 \Rightarrow t = 10 \cdot \frac{30}{13} \Rightarrow t = 23\frac{1}{3}$

Michiel is verder van huis dan Joost als

$23\frac{1}{3} < t < 100$



40a) $f(x) = 0 \Rightarrow \frac{1}{2}x^2 - 4 = 0 \Rightarrow \frac{1}{2}x^2 = 4 \Rightarrow x^2 = 8 \Rightarrow x = \pm\sqrt{8}$

$\xrightarrow{\text{Nulpunten}} (-\sqrt{8}; 0) \text{ en } (\sqrt{8}; 0)$

40b) $f(x) = g(x) \Rightarrow \frac{1}{2}x^2 - 4 = -x^2 + x \Rightarrow 1\frac{1}{2}x^2 - x - 4 = 0 \Rightarrow 3x^2 - 2x - 8 = 0 \Rightarrow$

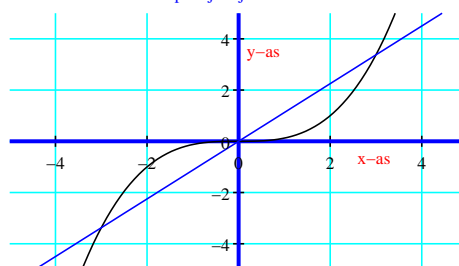
$\Rightarrow x = \frac{2 \pm \sqrt{4 - 4 \cdot 3 \cdot (-8)}}{6} \Rightarrow x = \frac{2 \pm \sqrt{100}}{6} \Rightarrow x = 2 \vee x = -1\frac{1}{3}$

$\xrightarrow{\text{Snijpunten}} (2; -2) \text{ en } (-1\frac{1}{3}; 3\frac{1}{9})$

40c) $f(x) > g(x) \Rightarrow x < -1\frac{1}{3} \vee x > 2$

41a) $\frac{1}{8}x^3 = 1\frac{1}{8}x \Rightarrow \frac{1}{8}x^3 - 1\frac{1}{8}x = 0 \Rightarrow$
 $\Rightarrow \frac{1}{8}x(x^2 - 9) = 0 \Rightarrow x = 0 \vee x = 3 \vee x = -3$
 $x = 0 \Rightarrow f(0) = 0 \xrightarrow{\text{Snijpunt}} (0; 0)$
 $x = -3 \Rightarrow f(-3) = \frac{1}{8}(-3)^3 \Rightarrow$
 $\Rightarrow f(-3) = \frac{-27}{8} \Rightarrow$
 $\Rightarrow f(-3) = -3,375 \xrightarrow{\text{Snijpunt}} (-3; -3,375)$
 $x = 3 \Rightarrow f(3) = \frac{1}{8}(3)^3 \Rightarrow$
 $\Rightarrow f(3) = 3,375 \xrightarrow{\text{Snijpunt}} (3; 3,375)$

41b) $f(x) \geq g(x) \Rightarrow -3 \leq x \leq 0 \vee x \geq 3$
 plaatje bij Som 41



42) $S = 8x + 5$ S in duizenden guldens; x het ledental in honderden

42a) Hfl 5000, -

42b) Subsidie Hfl 41800, - $\Rightarrow S = 41,8$

41,8 = $8x + 5 \Rightarrow 8x = 36,8 \Rightarrow x = 4,6 \rightarrow 460$ leden

42c) $x^2 + 5x + 4 > 8x + 5 \Rightarrow x^2 - 3x - 1 > 0$

$x^2 - 3x - 1 = 0 \Rightarrow x = \frac{3 \pm \sqrt{9+4}}{2} \Rightarrow x = 1\frac{1}{2} \pm \sqrt{13} \Rightarrow x \simeq 3,303 \vee x \simeq -0,3 \leftarrow \begin{matrix} x \simeq -0,3: \text{Vervalt} \end{matrix}$

ABC - formule $ax^2+bx+c : x = \frac{-b \pm \sqrt{b^2 - 4 \cdot a \cdot c}}{2 \cdot a}$

G1) Voordeel: Snel

Nadeel :

G3c) $x \simeq -1,8$

G4)

$D = [-4; 4] \quad B = [-16; 1]$

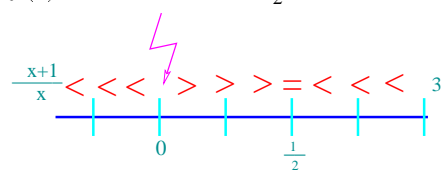
$D = [-3; 7] \quad B = [-2; 6]$

$D = [-1; 10] \quad B = [-1; 4]$

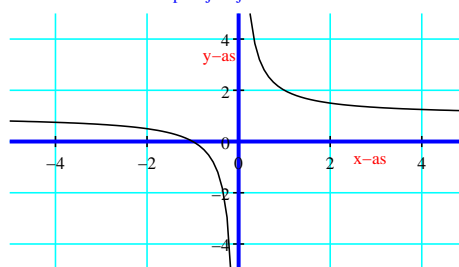
G5a) $f(x) = \frac{x+1}{x}$

$\frac{x+1}{x} = 3 \Rightarrow 3x = x+1 \Rightarrow 2x = 1 \Rightarrow x = \frac{1}{2}$

$f(x) < 3 \Rightarrow x < 0 \wedge x > \frac{1}{2}$



plaatje bij Som G5



G5b) $0,92 < f(x), 1,08$

$\left. \begin{matrix} \frac{x+1}{x} = 0,92 \Rightarrow x+1 = 0,92x \Rightarrow 0,08x = -1 \Rightarrow x = -12,5 \\ \frac{x+1}{x} = 1,08 \Rightarrow x+1 = 1,08x \Rightarrow 0,08x = 1 \Rightarrow x = 12,5 \end{matrix} \right\} \rightarrow x \leq -12,5 \wedge x \geq 12,5$

G5d) $y = 0,4$

G6a) $s = \frac{v^2}{12}$ In 0,8 seconden legt de auto nog 0,8v meter af

$S = \frac{v^2}{12} + 0,8v$

G6b) $\frac{v^2}{12} + 0,8v \leq 50 \Rightarrow v < 20,2m/s \Rightarrow v < 72,72km/uur$

G6c)

Stadsverkeer $\rightarrow v = 50km/uur \simeq 13,89m/s \rightarrow s = 27,5meter$

Snelweg $\rightarrow v = 120km/uur \simeq 33,33m/s \rightarrow s = 119,3meter$

G6d)

<i>Snelheid (km/uur)</i>	20	30	40	50	60	70	80	100	120
					↓	↓	↓	↓	
					16,67m/s	19,46m/s	22,22m/s	27,78m/s	
<i>Minimale Afstand (m)</i>	8	13	20	28	36	47	59	87	120

DOORWERKING

D1a) $129,5 - 30 \cdot 3,65 = Hfl\ 20,-$

D1b) $D = 3,65B + 20$

D2a) $(l; d)$

$$\left. \begin{matrix} (0; 1,50) \\ (200; 2,25) \end{matrix} \right\} \Rightarrow \frac{2,25-2,50}{200} = 0,00375 \rightarrow d = 0,00375 \cdot l + 15$$

D2b) $5,25 = 0,00375 \cdot l + 15 \Rightarrow 3,75 = 0,00375 \cdot l \Rightarrow l = 100 \xrightarrow{\text{Dus...}} 1000\ ton$

D2c) $5 - 1 = 4\ meter$

D2d) $4 = 0,00375 \cdot l + 1,5 \Rightarrow 2,5 = 0,00375 \Rightarrow l \simeq 667 \xrightarrow{\text{Dus...}} 667\ ton$

D3a) $y = \frac{150}{x^2}$

D3b)

$$f(3) = \frac{150}{9} \Rightarrow f(3) = 16\frac{2}{3} \xrightarrow{x=3dm} y = 16\frac{1}{2}\ dm$$

$$f(10) = \frac{150}{100} \Rightarrow f(10) = 1\frac{1}{2} \xrightarrow{x=10dm} y = 1\frac{1}{2}\ dm$$

D3c)

$$x = 50 \Rightarrow y = \frac{150}{50^2} \Rightarrow y = 0,06$$

$$y = 50 \Rightarrow x^2 = \frac{150}{50} \Rightarrow x^2 = 3 \Rightarrow x = \sqrt{3}$$

$$D_f : [\sqrt{3}; 50] \quad B_f : [0,06; 50]$$

D4a) $y = 12 \cdot \left(\frac{x}{100}\right)^2 + 3 \quad -150 \leq x \leq 150$

$$x = -150 \Rightarrow y = 12 \cdot \left(\frac{-150}{100}\right)^2 + 3 \Rightarrow y = 30$$

$$x = 150 \Rightarrow y = 30$$

Op Parabool $\xrightarrow{(-150;30) \text{ en } (150;0)}$ Klopt

D4b) Laagste punt bij $x = 0$

$$x = 0 \Rightarrow y = 12 \cdot \left(\frac{0}{100}\right)^2 + 3 \Rightarrow y = 3$$

Parabool voldoet alleen aan de laatste eis

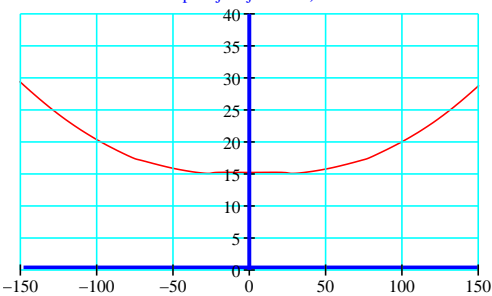
$$y \leq 20$$

D4c) $x = -150 \Rightarrow y = 6 \cdot \left(\frac{-150}{100}\right)^2 + 15 \Rightarrow y = 28,5$

$$x = 0 \Rightarrow y = 6 \cdot 0 + 15 \Rightarrow y = 15 \xrightarrow{\text{op laagste punt}} \text{Voldoet aan beide eisen}$$

D4d)

plaatje bij SomD4)



<i>x</i>	-150	-100	-50	0	50	100	150
<i>y</i>	28,5	21	16,5	15	16,5	21	28,5