[1][2]

UITWERKINGEN VOOR HET HAVO
B1 DEEL 2 HOOFDSTUK 1

KERN 1 FUNCTIES

1a) $156*2,30+82=440,8 \longrightarrow 440,8*1,06 \approx hfl\,467,25$
1b) $\frac{374,6}{1,06} \approx 353,40 \longrightarrow 353,40-82=273,40 \longrightarrow \frac{273,40}{2,3} \approx 118,87\,m^3$

2a) $y=x^2-4$ $g=\sqrt{p-2}$
2b) $b=\frac{1}{2}a-4$ $t=-s+1$
2c) $v \xrightarrow{x-1} .... \xrightarrow{+2} .... \xrightarrow{*3} w$
$t \xrightarrow{.....^2} .... \xrightarrow{*6} .... \xrightarrow{-5} n$
2d) $d \xrightarrow{-1} .... \xrightarrow{.....^2} c$
$m \xrightarrow{*6} .... \xrightarrow{+5} .... \xrightarrow{.....^2} n$

3a) $r \xrightarrow{.....^2} .... \xrightarrow{*uit} A$
3b) $r=4,7 \Rightarrow A=4\pi*4,7^2=88,36\pi \approx 277,6$
4a) $B=2500*1,058^t$
4b) Een Exponentiële Functie
4c) $2500*1,058^{12} \approx 4917,8$; $2500*1,058^{13} \approx 5202,998 \approx 5203 \longrightarrow dus\,na\,13\,jaar.$

5a) ”*u* is een functie van *b*” betekent :

Bij elk mogelijk begingetal *b* (input) ligt de uitkomst *u* (output) vast.

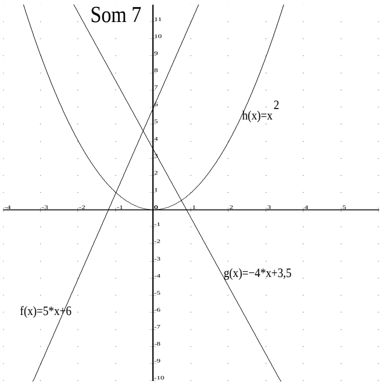
Dus bij elke *b* hoort maar *één u*. Bij een horizontale lijn is dit het geval.
5b) Bij een verticale lijn is dit niet het geval. Bij de lijn $b=3 \longrightarrow$ horen verschillende $u's$.

6a) $f(1)=5-\frac{1}{2}*1=4\frac{1}{2} \longrightarrow klopt\,met\,de\,Grafiek$
$f(2)=5-\frac{1}{2}*2=4 \longrightarrow klopt\,met\,de\,Grafiek$
6b) Alles klopt:
$g(-1)=-(-1)^2+2*(-1)+2=-1-2+2=-1$
$g(0)=-0^2+2*0+2=2$
$g(2)=-2^2+2*2+2=2$
$g(3)=-3^2+2*3+2=-1$

7a) $f(x)=5x+6$ $h(-2)=4$
$f(5)=5*5+6=31$
$f(-1)=5*(-1)+6=1$
$f\left(\frac{1}{2}\right)=5*\frac{1}{2}+6=8\frac{1}{2}$
7b) $g(x)=-4x+3\frac{1}{2}$ $h(0)=0$
$g(-2)=-4*(-2)+3\frac{1}{2}=11\frac{1}{2}$
$g(4)=-4*4+3\frac{1}{2}=-12\frac{1}{2}$
$g\left(1\frac{1}{2}\right)=-4*(1\frac{1}{2})+3\frac{1}{2}=-2\frac{1}{2}$
7c) $h(x)=x^2$ $h(5)=25$

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

[2] 
werd gemaakt onder LinuX met LaTeX *en* LyX



8) $y = -2x^2 + 3x - 7$
8a) $h : h(x) = -2x^2 + 3x - 7$
8b) $h(0)$: de $y - waarden$ behorend bij $x = 0$ dus $h(0) = -7$
9a) 125 km
9b) $k \geq 125$

10a)	$f(x)$	<	<	=	>	>	>	>	>	>	>	>	$g(x)$
10b)	$f(x)$	<	<	=	>	>	>	>	>	=	<	<	$g(x)$
10c)	$f(x)$	<	<	<	<	=	<	<	<	=	>	>	$g(x)$
	x	**-2**		**-1**		**0**		**1**		**2**		**3**	x

11a) $f(x) < g(x) \longrightarrow x < -1$
11b) $f(x) < g(x) \longrightarrow x < -1 \bigvee x > 2$ overigens: $\bigvee betekent\ 'of'\ \ \bigwedge\ betekend\ 'en'$
11c) $f(x) < g(x) \longrightarrow x < 0 \bigvee 0 < x < 2$

12a) $f(x) = -1\ f(3) = 1\ g(0) = 4\ g(4) = 0$
12b) $f(x) = g(x) \longrightarrow x = 0 \bigvee x = 3$
12c) $f(x) > g(x) \longrightarrow x = 0 \bigvee x > 3$

KERN 2
Domein & Bereik

13)

$4 - x^2 \geq 0 \Rightarrow -x^2 \geq -4 \Rightarrow x^2 \leq 4$

$4 - x^2$	<<<<	=	>>>>	=	<<<<	0
		-$\sqrt{2}$		$\sqrt{2}$		

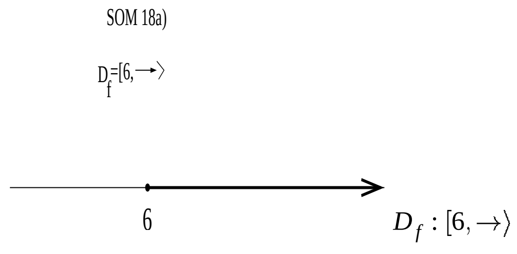
14a) $[-3, 1\rangle$ $-3 \leq x < -1$
14b) $\left\langle\sqrt{5}, 7\right]$

$x \leq -7\frac{1}{4}$

$x > 5,17$
15) $f(x) = \sqrt{4x - 12}$
15a) $f(0) = \sqrt{4.0 - 12} = \sqrt{-12} \xrightarrow{negatief!!!!}$ bestaat niet
15b) $4x - 12 \geq 0 \Rightarrow 4x \geq 12 \Rightarrow x \geq 3 \xrightarrow{Dus\,het\,domein\,D_f\,is} D_f : [3, \rightarrow\rangle$
15c)

16) $f(x) = \sqrt{7x - 5} : 7x - 5 \geq 0 \Rightarrow 7x \geq 5 \Rightarrow x \geq \frac{5}{7} \xrightarrow{Dus\,het\,domein\,D_f\,is} D_f : \left[\frac{5}{7}, \rightarrow\right\rangle$
$g(x) = \sqrt{-2x - 7} - 3 : -2x - 7 \geq 0 \Rightarrow -2x \geq 7 \Rightarrow x \leq 3\frac{1}{2} \xrightarrow{Dus\,het\,domein\,D_g\,is} D_g : \left\langle\leftarrow, -3\frac{1}{2}\right]$
17a) $f(x) = 2 \longrightarrow x = 1$
17b) $f(x) = 6 \longrightarrow x = -1 \bigvee x = 3$

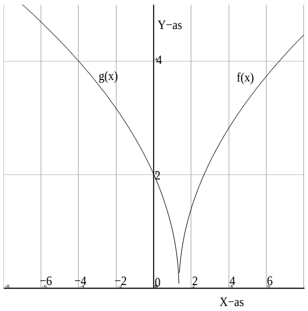
18a) $f(x) = \sqrt{\frac{1}{2}x - 3}$: $\frac{1}{2}x - 3 \geq 0 \Rightarrow \frac{1}{2}x \geq 3 \Rightarrow x \geq 6$



18b) $f(x) = \sqrt{\frac{1}{2}x - 3} = \sqrt{7} \Rightarrow \frac{1}{2}x - 3 = 7 \Rightarrow \frac{1}{2}x = 10 \Rightarrow x = 20$
18c) $f(x) = \sqrt{\frac{1}{2}x - 3} = \sqrt{2} \Rightarrow \frac{1}{2}x - 3 = 2 \Rightarrow \frac{1}{2}x = 5 \Rightarrow x = 10$
18d) $f(x) = \sqrt{\frac{1}{2}x - 3} = 0 \Rightarrow \frac{1}{2}x - 3 = 0 \Rightarrow \frac{1}{2}x = 3 \Rightarrow x = 6$
18e) $f(x) = \sqrt{\frac{1}{2}x - 3} = \frac{1}{4} \Rightarrow \frac{1}{2}x - 3 = \frac{1}{16} \Rightarrow \frac{1}{2}x = 3\frac{1}{16} \Rightarrow x = 6\frac{1}{8}$
19a) $f(x) = \sqrt{3x - 4} : 3x - 4 \geq 0 \Rightarrow 3x \geq 4 \Rightarrow x \geq 1\frac{1}{3}$ $D_f : \left[1\frac{1}{3}, \rightarrow\right\rangle$
19b) $g(x) = \sqrt{4 - 3x} : 4 - 3x \geq 0 \Rightarrow -3x \geq -4 \Rightarrow x \leq 1\frac{1}{3}$ $D_g : \left\langle\leftarrow, 1\frac{1}{3}\right]$
19c)

x	$1\frac{1}{3}$	2	3	4	5	6
$f(x)$	0	$\sqrt{2}$	$\sqrt{5}$	$\sqrt{8}$	$\sqrt{11}$	$\sqrt{14}$

x	-2	-1	0	1	$1\frac{1}{3}$	
$g(x)$	$\sqrt{10}$	$\sqrt{7}$	2	1	0	

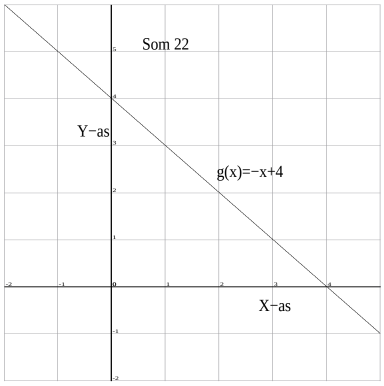


20) $f(x)=\sqrt{3x}+5 : 3x\geq 0\Rightarrow x\geq 0\Rightarrow f(x)\geq 5\ B_f:[5,\rightarrow\rangle$
$g(x)=\sqrt{5-x}\ B_g:[0,\rightarrow\rangle$
$h(x)=x^2-2 : x^2\geq 0\Rightarrow h(x)=x^2-2\geq -2\ B_h:[-2,\rightarrow\rangle$
21a) $f\left(1\frac{1}{2}\right)=-\left(1\frac{1}{2}\right)+3*1\frac{1}{2}+3=-2\frac{1}{4}+4\frac{1}{2}+3=5\frac{1}{4}$
21b) $f(x)=-x^2+3x+3=-6\Rightarrow -x^2+3x+9=0\Rightarrow x^2-3x-9=0\xrightarrow{ABC-formule}$
$\xrightarrow{a=1\ b=-3\ c=-9} x=\frac{3+\sqrt{9+3x}}{2}\bigvee x=\frac{3-\sqrt{9-3x}}{2}$ (laatste keer..." $\bigvee$" betekend "of")$\Rightarrow$
$x=1\frac{1}{2}+\frac{1}{2}\sqrt{45}\bigvee x=1\frac{1}{2}-\frac{1}{2}\sqrt{45}\xrightarrow{vereenvoudigen} x=1\frac{1}{2}\pm\frac{1}{2}\sqrt{9*5}\Rightarrow$
$x=1\frac{1}{2}\pm\frac{1}{2}\sqrt{9}*\sqrt{5}\Rightarrow x=1\frac{1}{2}\pm 1\frac{1}{2}\sqrt{5}$
21c) $x=1\frac{1}{2}$ is de symmetrie-as$\longrightarrow$ f$(x)=5\frac{1}{4}$ is de $Top.B_f:\left\langle\leftarrow,5\frac{1}{4}\right]$

KERN 3
LINEAIRE FUNCTIES

22a) $g(x) = 3(2-x) + 2(x-1) = 6 - 3x + 2x - 2 = -x + 4$
22b) Snijpunt met de $y-as$: $x = 0 \Rightarrow g(0) = 4$ het punt $(0, 4)$
22c) Hellingsgetal is -1

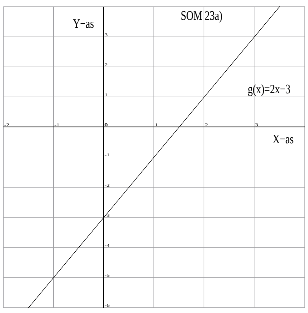
22d) De afbeelding:



23a)

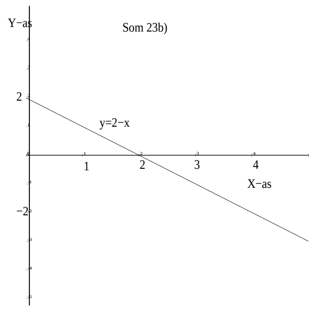
$g(x) = 2x - 3$

x	0	1	2
$g(x)$	-3	-1	1

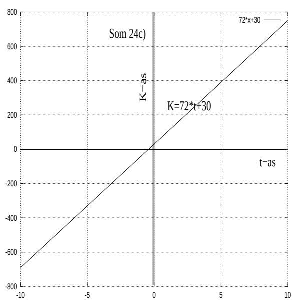


23b) $y = 2 - x$ $x \geq 0$

x	0	1	2
y	2	1	0



24a) $\frac{1}{2} * 72 + 30 = hfl\,66, -$
24b) $K = 72t + 30$; t in uren K in guldens (maar hoeveel €'s zijn dat?)
24c)

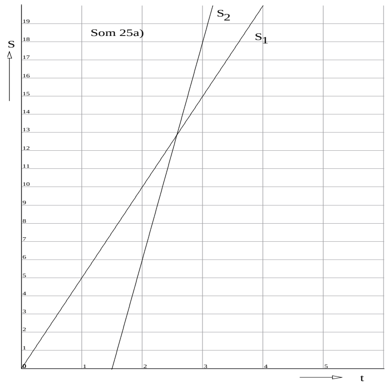


24d) $72t + 30 = 222 \Rightarrow 72t = 192 \Rightarrow t = \frac{192}{72}$ $\xrightarrow{vereenvoudigen} t = \frac{8}{3} \Rightarrow 2\frac{2}{3}$
Dus 2 uur en 40 minuten.

25) $S_1 = 5t$ (S in kilometer , t in uren) $S_2 = 12t - 18$

t	0	1	2	3
$S_!$	0	5	10	15
S_2			6	18

25a)



25b) Wandelaar 5 km/uur ; Fietser 12 km/uur

25c) $12t - 18 = 0 \Rightarrow 12t = 18 \Rightarrow t = \frac{18}{12} \xrightarrow{vereenvoudigen} t = \frac{3}{2} \longrightarrow t = 1\frac{1}{2}$ ofwel anderhalf uur

25d) $12t - 18 = 5t \Rightarrow 7t = 18 \Rightarrow t = \frac{18}{7} = 2\frac{4}{7}$ Enzo: $5 * \frac{18}{7} = \frac{90}{7} = 12\frac{6}{7}km$

26a) $1 - x = 2x - 3 \Rightarrow 4 = 3x \Rightarrow x = \frac{4}{3} = 1\frac{1}{3} \longrightarrow y = 1 - 1\frac{1}{3} = -\frac{1}{3}$ Snijpunt $\left(1\frac{1}{3}, \frac{1}{3}\right)$

26b) $x - 5 = \frac{1}{3}x - 1 \Rightarrow \frac{2}{3}x = 4 \Rightarrow x = 6 \longrightarrow y = 6 - 5 = 1$ Snijpunt $(6, 1)$

26c) $\frac{1}{5}x = \frac{1}{3}x \Rightarrow \frac{1}{5}x - \frac{1}{3}x = 0 \Rightarrow \frac{3}{15}x - \frac{5}{15}x = 0 \longrightarrow \frac{2}{15}x = 0 \Rightarrow x = 0 \Rightarrow y = 0$ Snijpunt $(0, 0)$

26d) $1 - 2x = 5 - 2x \Rightarrow 0 = 4 \xrightarrow{Dat\, lijkt\, me\, niet\, OK!!!}$ Er is Dus geen snijpunt.

$$\left.\begin{array}{l} y = 1 - 2x \\ y = 5 - 2x \end{array}\right\}$$ Beide functies hebben hetzelfde hellingsgetal $\longrightarrow$ het zijn *evenwijdige* lijnen

27)

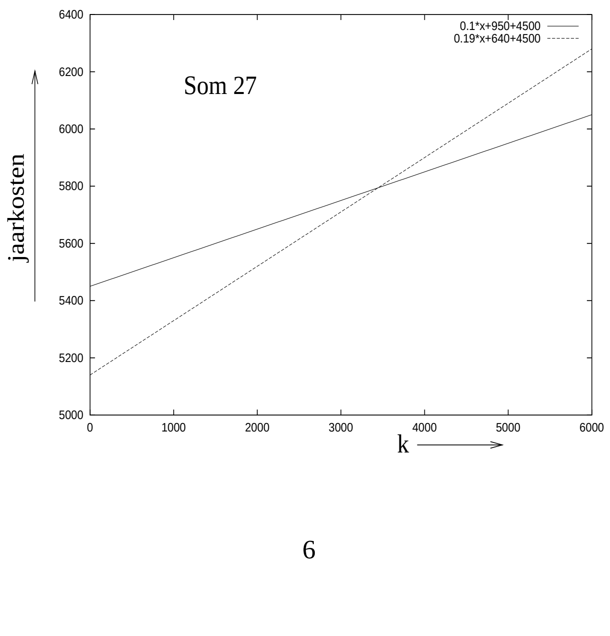
$$DIESELMOTOR \begin{cases} Hfl\, 950,- per\ jaar & aan\ wegenbelastig \\ Hfl\, 0,10\ per\ kilometer\ aan & brandstofkosten \end{cases}$$

$$BENZINEMOTOR \begin{cases} Hfl\, 640,- per\ jaar & aan\ wegenbelastig \\ Hfl\, 0,19\ per\ kilometer\ aan & brandstofkosten \end{cases}$$

$$WAARDEDALING\ Hfl\, 4500,- \ per\ jaar$$

27a) $B = 4500 + 640 + 0,19k$

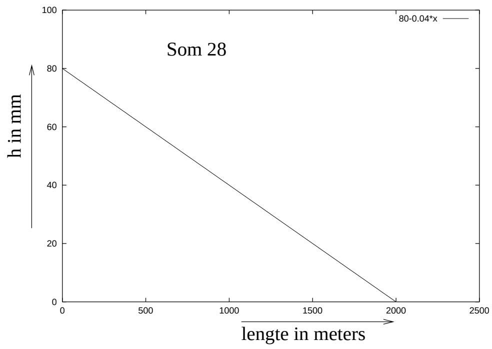
27b)



27c) $4500+950+0,1k=4500+640+0,19k \longrightarrow 310=0,09k \Rightarrow k=\frac{310}{0,09} \approx 3444km$

28a)

$h(0)=80$ $h(2000)=0$



28b) $\frac{-80}{2000}=\frac{-8}{200}=\frac{-4}{100} \longrightarrow k=80-0,04l$

28c) $h(0)=80$ $h(l)=78 \longrightarrow 80-0,04l=78$

$\longrightarrow 0,04l=2 \Rightarrow l=50$

$\xrightarrow{dus de lengte is} 50-0=50\,meter$

29a) $(1,5) \Rightarrow 5=a*1+b=a+b$

$(4,-1) \Rightarrow -1=a*4+b=4a+b$

$$\begin{array}{c} 4a+b=-1 \\ a+b=5 \\ \hline 3a=-6 \Rightarrow a=-2 \end{array} \xrightarrow{dus\, a=-2\, invullen in} 4a-b=-1 \Rightarrow -8+b=-1 \Rightarrow b=7$$

29b) Per eenheid (x) daalt de functie 2 .

Snijpunt met de $y-as \xrightarrow{het\ punt\ (0,7)} y=-2x+7$

30a) METHODE III $\left.\begin{array}{c}(-3.1)\\(5,-1)\end{array}\right\} \Rightarrow \frac{\triangle y}{\triangle x}=\frac{-2}{8}=\frac{-1}{4}$

$\left.\begin{array}{c}y=\frac{1}{4}x+b\\(-3,1)\end{array}\right\} \Rightarrow 1=\frac{1}{4}*-3+b \Rightarrow 1=\frac{3}{4}+b \Rightarrow b=\frac{1}{4}$

$\xrightarrow{en zo wordt} y=-\frac{1}{4}x+\frac{1}{4}$

METHODE II $\left.\begin{array}{c}y=ax+b\\(-3,1)\\(5,-1)\end{array}\right\} \Rightarrow \begin{array}{c}1=-3a+b\\-1=5a+b\\ \hline 2=-8a \longrightarrow a=-4\end{array}$ — etcetera etcetera Zie Boven↑

30b) $\left.\begin{array}{c}(1,-3)\\(-1,5)\end{array}\right\} \Rightarrow \frac{\triangle y}{\triangle x}=\frac{5-(-3)}{-1-1}=\frac{8}{-2}=-4$

METHODE III $\left.\begin{array}{c}y=-4x+b\\(1,-3)\end{array}\right\} \Rightarrow -3==-4*1+b \Rightarrow b=1$

$\xrightarrow{en zo wordt} y=-4x+1$

METHODE II $\left.\begin{array}{c}y=ax+b\\(1,-3)\\(-1,5)\end{array}\right\} \Rightarrow \begin{array}{c}-3=a+b\\5=-a+b\\ \hline -8=+2a \longrightarrow a=-4\end{array}$- etcetera etcetera Zie Boven↑

30c) $\left.\begin{matrix}(-22,-43)\\(28,-13\end{matrix}\right\} \Rightarrow \frac{\triangle y}{\triangle x}=\frac{-13-(-43)}{28-(-22)}=\frac{30}{50}=\frac{3}{5}$

METHODE III $\left.\begin{matrix}y=\frac{3}{5}x+b\\(-22,-43)\end{matrix}\right\} \Rightarrow -43=\frac{3}{5}*(-22)+b \Rightarrow b=-29.8 \longrightarrow$

$\xrightarrow{enzowordt} y=\frac{3}{5}x-29,8$

METHODE II $\left.\begin{matrix}y=ax+b\\(-22,-43)\\(28,-13)\end{matrix}\right\} \Rightarrow \frac{\begin{matrix}-43=-22a+b\\-13=28a+b\end{matrix}}{-30=-50a \longrightarrow a=\frac{3}{5}} \quad \left.\begin{matrix}y=\frac{3}{5}x+b\\(28,-13)\end{matrix}\right\} \Rightarrow -13=\frac{3}{5}*28+b \Rightarrow$

$b=-29,8 \xrightarrow{enzowordt} y=\frac{3}{5}x-29,8$

30d) $\left.\begin{matrix}(23,90)\\(234,512)\end{matrix}\right\} \Rightarrow \frac{\triangle y}{\triangle x}=\frac{512-90}{234-23}=\frac{422}{211}=2 \quad \left.\begin{matrix}y=2x+b\\(23,90)\end{matrix}\right\} \Rightarrow 90=2*23+b \Rightarrow b=44 \Rightarrow$

$\xrightarrow{enzowordt} y=2x+44$

31) $\left.\begin{matrix}(1,1)\\(5,6)\end{matrix}\right\} \xrightarrow{derichtingscoeficientawordt} a=\frac{\triangle y}{\triangle x}=\frac{6-1}{5-1}=\frac{5}{4}$

$\left.\begin{matrix}y=1\frac{1}{4}x+b\\(1,1)\end{matrix}\right\} \Rightarrow 1=1\frac{1}{4}+b \Rightarrow b=1-1\frac{1}{4} \Rightarrow b=\frac{1}{4} \xrightarrow{enDus....} y=1\frac{1}{4}x-\frac{1}{4}$

$\left.\begin{matrix}(2,10)\\(6,2)\end{matrix}\right\} \xrightarrow{derichtingscoeficientawordt} a=\frac{\triangle y}{\triangle x}=\frac{2-10}{6-2}=\frac{-8}{4}=-2$

$\left.\begin{matrix}y=-2x+b\\(2,10)\end{matrix}\right\} \Rightarrow 10=-2*2+b \Rightarrow 10=-4+b \Rightarrow b=14 \xrightarrow{enDus....} y=-2x+14$

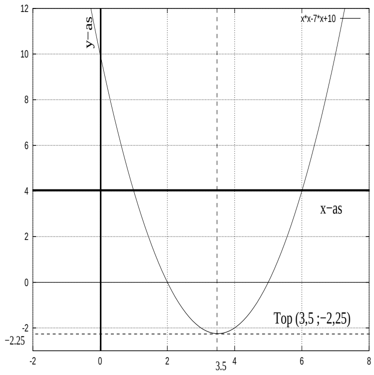
Snijpunt $1\frac{1}{4}x-\frac{1}{4}=-2x+14 \Rightarrow 3\frac{1}{4}x=14\frac{1}{4} \Rightarrow \frac{13}{4}x=\frac{57}{4} \Rightarrow x=\frac{57}{4}*\frac{4}{13} \Rightarrow x=\frac{57*4}{4*13} \Rightarrow x=\frac{228}{52} \approx 4,38$

$\longrightarrow y=-2*\frac{228}{52}+14=-2*4\frac{5}{13}+\frac{182}{13}=\frac{68}{13}=5\frac{3}{13} \approx 5,23 \longrightarrow Snijpunt:\left(4\frac{5}{13};5\frac{3}{13}\right) \approx (4,38;5,23)$

KERN 4
KWADRATISCHE FUNCTIES

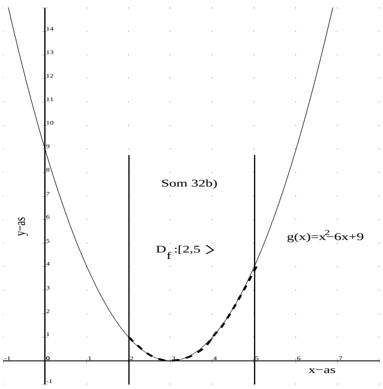
32a) $f(x) = x^2 - 7x + 10 \xrightarrow{\text{is een Dalparabool want.....}} 1 * x^2 \longrightarrow 1 > 0!!!!!$
$x^2 - 7x = 0 \Rightarrow x(x-7) = 0 \Rightarrow x = 0 \;\; of \;\; x - 7 = 0 \Rightarrow x = 0 \bigvee x = 7$
$x_{sym} = 3\frac{1}{2} \Rightarrow f(3\frac{1}{2}) = (3\frac{1}{2})^2 - 7 * 3\frac{1}{2} + 10 = 2\frac{1}{4} \xrightarrow{\text{de top van de Parabool is}} Top : \left(3\frac{1}{2}; -2\frac{1}{4}\right)$

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



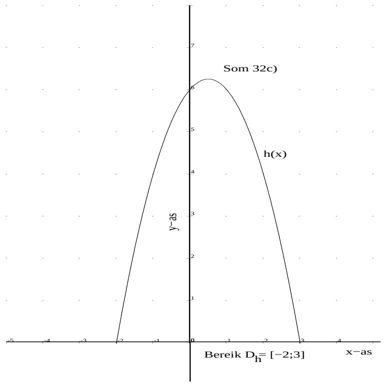
32b) $g(x) = x^2 - 6x + 9 \xrightarrow{x^2 \text{ is } 1*x^2 \text{.....en } 1>0 \text{ dus......}} Dal parabool$
$x^2 - 6x = 0 \Rightarrow x(x-6) = 0 \Rightarrow x = 0 \bigvee (x-6) = 0 \Rightarrow x = 0 \bigvee x = 6$
$x_{sym} = 3 \Rightarrow g(3) = 9 - 18 + 9 = 0 \xrightarrow{\text{de top van de Parabool is}} Top : (3;0)$
$Bereik \;\; D_f : [2;5\rangle$

x	2	3	4	5	6
$g(x)$	1	0	1	4	9



32c) $h(x) = -x^2 + x + 6 \xrightarrow{-x^2 \text{ is } -1*x^2 \text{.....en } -1<0 \text{ dus......}} Bergparabool$
$-x^2 + x = 0 \Rightarrow x(-x+1) = 0 \Rightarrow x = 0 \bigvee (-x+1) = 0 \Rightarrow x = 0 \bigvee x = 1$
$x_{sym} = \frac{1}{2} \Rightarrow h(\frac{1}{2}) = -\frac{1}{4} + \frac{1}{2} + 6 = 6\frac{1}{4} \xrightarrow{\text{de top van de Parabool is}} Top : \left(\frac{1}{2}; 6\frac{1}{4}\right)$
$Bereik \;\; D_h = [-2 : 3]$

x	-2	-1	0	1	2	3
$h(x)$	0	4	6	6	4	0



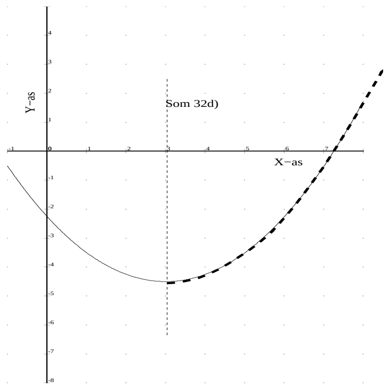
32d) $y=\frac{1}{4}x^2-1\frac{1}{2}-2\frac{1}{4}$

$\frac{1}{4}x^2-1\frac{1}{2}x=0\Rightarrow x(\frac{1}{4}x-1\frac{1}{2})=0\Rightarrow x=0\bigvee(\frac{1}{4}x-1\frac{1}{2})=0\Rightarrow x=0\bigvee\frac{1}{4}x=\frac{3}{2}\Rightarrow x=0\bigvee x=6$

\$x_{sym}=+3\Rightarrow y=\frac{1}{4}(3)^2-1\frac{1}{2}*3-2\frac{1}{4}=\frac{9}{4}-\frac{9}{2}+(-\frac{9}{4})=-4\frac{1}{2}\xrightarrow{de\ top\ van\ de\ Parabool\ is}Top:\left(3;-4\frac{1}{2}\right)$

$x>3$

x	4	5	6	8	10
y	$-4\frac{1}{4}$	-3$\frac{1}{2}$	$-2\frac{1}{4}$	$1\frac{3}{4}$	$7\frac{3}{4}$



33a) $f(x)=-x^2+8x$

$0=-x^2+8x\Rightarrow 0=x(-x+8)\Rightarrow x=0\bigvee(-x+8)=0\Rightarrow\quad x=0\bigvee x=8$

dus de punten (0,0) *en* (8,0)

33b) $y=-0^2+0=0\xrightarrow{het\ punt}(0,0)$

34)

$$De Kwadatische Functie\longrightarrow f(x)=ax^2+bx+c$$

$$ABC-Formule\longrightarrow x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$$

$x^2-3x-4=0\xrightarrow{hierin\ is\ dus}\begin{cases}a=+1\\b=-3\\c=-4\end{cases}$

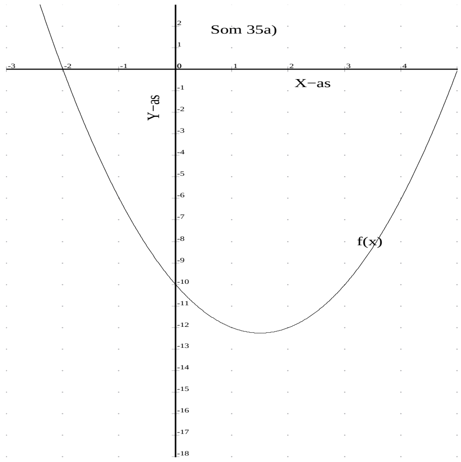
$x=\frac{-(-3)\pm\sqrt{9+16}}{2}=\frac{+3\pm\sqrt{25}}{2}\Rightarrow x=\frac{+3-5}{2}\bigvee x=\frac{-3+5}{2}\Rightarrow x=-1\bigvee x=4$

(het $\bigvee-teken$ betekent "of"....)

35a) $f(x)=x^2-3x-1=0\xrightarrow{a>0......}dal parabool$

$x^2-3x-10=0\xrightarrow{buiten\ haakjes\ halen}(x-5)(x+2)=0\Rightarrow x-5=0\bigvee x+2=0\Rightarrow x=5\bigvee x=-2\longrightarrow$
$x_{sym}=1\frac{1}{2}$

Dus de Top is $\left(1\frac{1}{2}; f(1\frac{1}{2})\right) = \left(1\frac{1}{2}; -12\frac{1}{4}\right)$

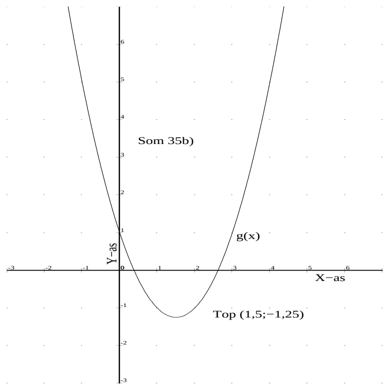


35b) $g(x) = x^2 - 3x + 1$

$$x^2 - 3x + 1 = 0 \Rightarrow \left\{ \begin{array}{c} a = +1 \\ b = -3 \\ c = +1 \end{array} \right\} \xrightarrow{a>0....dal\,parabool} x = \frac{3 \pm \sqrt{9-4}}{2} \Rightarrow x = \frac{3 \pm \sqrt{5}}{2} \Rightarrow$$

$$x = 1\frac{1}{2} - \frac{1}{2}\sqrt{5} \bigvee x = 1\frac{1}{2} + \frac{1}{2}\sqrt{5} \longrightarrow$$

$dus\ de\ punten\ (1\frac{1}{2} - \frac{1}{2}\sqrt{5};0) \bigvee (1\frac{1}{2} + \frac{1}{2}\sqrt{5};0)$



$$x_{sym} = 1\frac{1}{2} \Rightarrow g(1\frac{1}{2}) = -1\frac{1}{4}$$

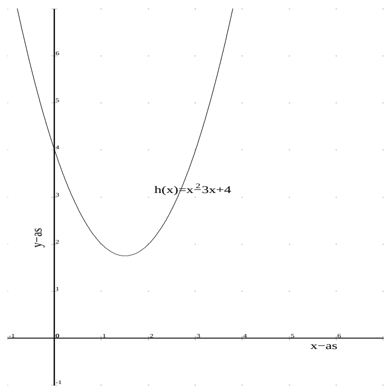
$$\xrightarrow{de\ top\ van\ de\ dal parabool\ is\ dus} Top(1\frac{1}{2}, -1\frac{1}{4})$$

35c) $h(x) = x^2 - 3x + 4$

$$x^2 - 3x + 4 = 0 \Rightarrow \left\{ \begin{array}{c} a = +1 \\ b = -3 \\ c = +4 \end{array} \right\} \xrightarrow{a>0...dal\,parabool} x = \frac{3 \pm \sqrt{9-16}}{2} = \frac{3 \pm \sqrt{-7}}{2} \xrightarrow{\sqrt{-7}\ kanNiet}$$

Er zijn dus geen snijpunten met de $X - as$.

$$x^2 - 3x + 4 = 4 \Rightarrow x^2 - 3x = 0 \xrightarrow{buitenhaakjeshalen} x(x-3) = 0 \Rightarrow x = 0 \bigvee x = 3.$$

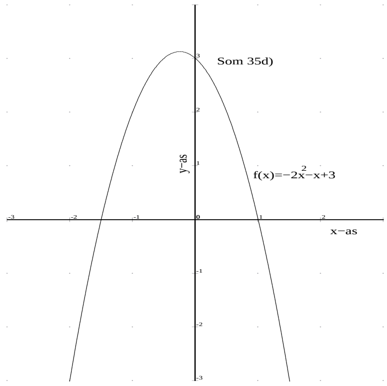


Dus de punten

$(0,4)$ en $(3,4) \longrightarrow x_{sym} = 1\frac{1}{2} \Rightarrow h(1\frac{1}{2}) = 1\frac{3}{4}$

35d) $f(x) = -2x^2 - x + 3$

$$-2x^2 - x + 3 = 0 \Rightarrow \left\{ \begin{array}{c} a = -2 \\ b = -1 \\ c = +3 \end{array} \right\} \xrightarrow{a<0...bergparabool} x = \frac{1 \pm \sqrt{1+24}}{-4} = \frac{1 \pm 5}{-4} \Rightarrow x = -1\tfrac{1}{2} \bigvee x = 1$$

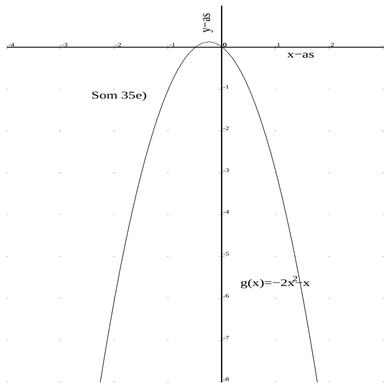


$$\xrightarrow{de\ snijpunten} \left(-1\tfrac{1}{2}; 0\right)\ en\ (1,0) \Rightarrow x_{sym} = -\tfrac{1}{4} \Rightarrow$$
$$f(-\tfrac{1}{4}) = -2\left(-\tfrac{1}{4}\right)^2 - \left(-\tfrac{1}{4}\right) + 3 = -\tfrac{1}{8} + \tfrac{2}{8} + 3 = 3\tfrac{1}{8}$$

35e) $g(x) = -2x^2 - x$

$$-2x^2 - x = 0 \Rightarrow \left\{ \begin{array}{c} a = -2 \\ b = -1 \\ c = 0 \end{array} \right\} \xrightarrow{a<0....bergparabool}$$

$$-2x^2 - x = 0 \Rightarrow x(-2x - 1) = 0 \Rightarrow x = 0 \bigvee (-2x - 1) = 0 \Rightarrow x = 0 \bigvee 2x = -1 \Rightarrow x = 0 \bigvee x = -\tfrac{1}{2}$$

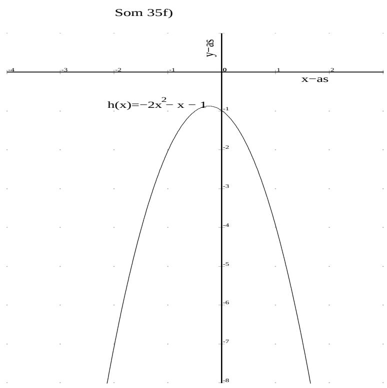


Dus de snijpunten: $(0;0)$ en $(-\tfrac{1}{2};0)$
$x_{sym} = -\tfrac{1}{4} \Rightarrow g(-\tfrac{1}{4}) = \tfrac{1}{8}$

35f) $h(x) = -2x^2 - x - 1$

$$-2x^2 - x - 1 = 0 \Rightarrow \left\{ \begin{array}{c} a = -2 \\ b = -1 \\ c = -1 \end{array} \right\} \xrightarrow{a<0...bergparabool} x = \frac{1 \pm \sqrt{1-8}}{-4} = \frac{1 \pm \sqrt{-7}}{-4} \xrightarrow{\sqrt{-7}\ kanniet} \text{Geen oplossing!}$$

Er zijn dus geen snijpunten met de $x - as$ (de lijn $y = 0$)



$-2x^2 - x = 0 \Rightarrow x(-2x - 1) = 0 \Rightarrow$
$x = 0 \bigvee x = -\tfrac{1}{2}$ ofwel de punten $(0;-1)$ en $(-\tfrac{1}{2}, 1)$
$h(-\tfrac{1}{4}) = -2(-\tfrac{1}{4})^2 - (-\tfrac{1}{4}) = -2(-\tfrac{1}{16}) + \tfrac{1}{4} = \tfrac{2}{16} + \tfrac{1}{4} = \tfrac{1}{8} + \tfrac{2}{8} = \tfrac{3}{8}$

36a) $f(x) = 3x^2 + 6x - 7$ $(a > 0 \ldots dal\, parabool)$
$3x^2 + 6x = 0 \Rightarrow 3x(x+2) = 0 \Rightarrow 3x = 0 \bigvee x+2 = 0 \Rightarrow x = 0 \bigvee x = -2 \longrightarrow X_{sym} = -1$

36b) De functie heeft een minimum, want voor x^2 staat een 3 $\xrightarrow{a>0}$ dus er is sprake van een Dalparabool.
$f(-1) = 3*(-1)^2 + 6*-1-7 = 3-6-7 = 3-13 = -10$

36c) Linker nulpunt $x \approx -2,83$ Van $-2,83$ naar -1 is $1,83$ .....dan ook 1,83 vanaf -1 naar rechts;
dus $x \approx 0,83$

36d) $\left.\begin{array}{l} a = +3 \\ b = +6 \\ c = -7 \end{array}\right\} \Rightarrow x = \frac{-6 \pm \sqrt{36-4*3*(-7)}}{6} \Rightarrow x = \frac{-6 \pm \sqrt{120}}{6} \Rightarrow x \approx -2,83 \bigvee x \approx 0,83$

37a)PLAATJE NOG INVOEGEN !@!@$^Q#$TQWFT

37b) $a(x-1)(x+5) = 0 \Rightarrow x-1 = 0 \bigvee x+5 = 0 \Rightarrow x = 1 \bigvee x = -5$

37c) $f(0) = 4 \longrightarrow f(0) = a(0-1)(0+5) = 4 \Rightarrow -a*5 = 4 \Rightarrow -5*a = 4 \Rightarrow a = -\frac{4}{5}$

37d) $f(x) = -\frac{4}{5}(x-1)(x+5) \longrightarrow f(x) = -\frac{4}{5}x^2 + 3\frac{1}{5}x + 4$

38) Snypunten met de $x-as$ $(-1;0)$ en $(3;0)$
$\longrightarrow \left.\begin{array}{c} f(x) = a*(x+1)(x-3) \\ punt\ (2;2)\ ligt\ op\ parabool \end{array}\right\} \Rightarrow f(2) = a(2+1)(2-3) = 2 \Rightarrow -3a = 2 \Rightarrow a = -\frac{2}{3}$
$\xrightarrow{Invullen a=-\frac{2}{3}\ in\ f(x)} f(x) = -\frac{2}{3}(x+1)(x-3) \Rightarrow f(x) = -\frac{2}{3}(x^2+x-3x-3) \Rightarrow f(x) = -\frac{2}{3}x^2 + 1\frac{1}{3}x + 2$

39a) Snijpunten met de $x-as$ $(2;0)$ en $(-1;0)$
$\longrightarrow \left.\begin{array}{c} f(x) = a*(x-2)(x+1) \\ punt\ (0;2)\ ligt\ op\ parabool \end{array}\right\} \Rightarrow f(0) = a(0-2)(0+1) = 2 \Rightarrow -2a = 2 \Rightarrow a = -1$
$\xrightarrow{Invullen\, a=-1\ in\ f(x)} \Rightarrow f(x) = -1*(x-2)(x+1) \Rightarrow f(x) = -1*(x^2-x-2) \Rightarrow f(x) = -x^2 + x + 2$

39b) Snijpunten met de $x-as$ $(-2;0)$ en $(1;0)$
$\longrightarrow \left.\begin{array}{c} f(x) = a*(x+2)(x-1) \\ punt\ (0;2)\ ligt\ op\ parabool \end{array}\right\} \Rightarrow f(0) = a(0+2)(0-1) = 2 \Rightarrow -2a = 2 \Rightarrow a = -1$
$\xrightarrow{Invullen\, a=-1\ in\ f(x)} \Rightarrow f(x) = -1*(x+2)(x-1) \Rightarrow f(x) = -(x^2+x-2) \Rightarrow f(x) = -x^2 - x + 2$

39c) De lijn door de volgende punten $(-2;0)$ $(-3;0)$ $(1;0)$
(Let op de y-as coordinaat) is de lijn $y = 0$
En dat kan dus geen parabool parabool zijn.

39d) Snijpunten met de $x-as$ $(3;0)$ en $(-1;0)$
$\longrightarrow \left.\begin{array}{c} g(x) = a*(x-3)(x+1) \\ punt\ (0;-4)\ ligt\ op\ parabool \end{array}\right\} \Rightarrow g(0) = a(0-3)(0+1) = -4 \Rightarrow -3a = -4 \Rightarrow a = \frac{-4}{-3} = 1\frac{1}{3}$
$\xrightarrow{Invullen\, a=1\frac{1}{3}\ in\ g(x)} \Rightarrow g(x) = 1\frac{1}{3}*(x-3)(x+1)$
$\Rightarrow g(x) = 1\frac{1}{3}*(x^2-3x+x-3) \Rightarrow f(x) = 1\frac{1}{3}x^2 - 2\frac{2}{3}x - 4$

40) Snijpunten met de $x-as$ $(2;0)$ en $(-5;0)$
$\longrightarrow \left.\begin{array}{c} f(x) = a*(x-2)(x+5) \\ (3;3)\ \in\ parabool\ (\in: element\, van \ldots) \end{array}\right\} \Rightarrow f(3) = a(3-2)(3+5) = 3 \Rightarrow 8a = 3 \Rightarrow a = \frac{3}{8}$
$\xrightarrow{Invullen\, a=\frac{3}{8}\ in\ f(x)} \Rightarrow f(x) = \frac{3}{8}*(x-2)(x+5)$
$\Rightarrow f(x) = \frac{3}{8}*(x^2-2x+5x-10) \Rightarrow f(x) = \frac{3}{8}x^2 + 1\frac{1}{8}x - 3\frac{3}{4}$

DOORWERKING

D1a) $\left.\begin{array}{r} Opp_{ABCD} = 12^2 = 144 \\ Opp_{APS} = \frac{1}{2} * 4 * 8 = 16 \end{array}\right\} \xrightarrow{Opp_{PQRS} = Opp_{ABCD} - 4 * Opp_{APS}} Opp_{PQRS} = 144 - 4 * 16 \longrightarrow$
$Opp_{PQRS} = 144 - 64 = 80$

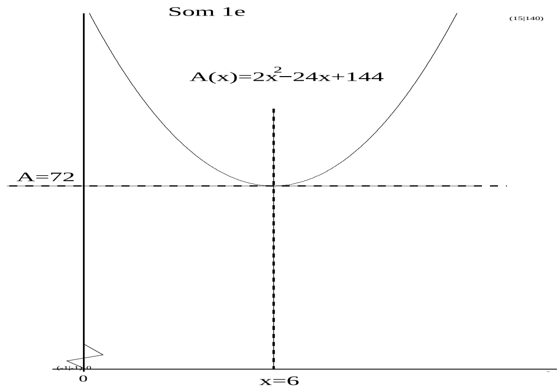
D1b) $Opp_{APS} = \frac{1}{2} * x * (12 - x) \Rightarrow A(x) = 144 - 4 * \frac{1}{2} * x * (12 - x) \Rightarrow A(x) = 144 - 2x(12 - x) \Rightarrow$
$A(x) = 2x^2 - 24x + 144$

D1c) $0 \leq AP \leq 12 \xrightarrow{Dus\ het\ Domein\ is} 0 \leq x \leq 12$

D1d) $A(x)$ geeft een Dalparabool.
$144 = 2x^2 - 24x + 144 \Rightarrow 0 = 2x^2 - 24x \Rightarrow 0 = x(2x - 24) \Rightarrow x = 0 \bigvee 2x = 24 \Rightarrow x = 0 \bigvee x = 12 \longrightarrow$
$x = 6$ is symmetrie-as$\longrightarrow$ minimum $A(6) = 72$.
Voor $x = 0$ en $x = 12$ is $A(x) = 144 \xrightarrow{groter\ kan\ niet}$ dus $Maximum = 144$ $B_A : [72; 144]$

D1e)

x	1	2	3	4	5
A	122	104	90	80	70



D2) $hh = \sqrt{7225 - a^2} - 75$

D2a) $a = 0 \Rightarrow h = \sqrt{7225} - 75 = 10$

D2b) $0 = \sqrt{7225 - a^2} - 75 \Rightarrow \sqrt{7225 - a^2} = 75 \xrightarrow{Beide\ kanten\ van\ = teken\ kwadrateren} 7225 - a^2 = 75^2 \Rightarrow$
$a^2 = 1600 \Rightarrow a = 40 \bigvee a = -40$
De Boog strekt zich van -40 tot $+40 \longrightarrow 40 - (-40) = 80\, meter\ breed$

D3a) $d = al + b$
$\left.\begin{array}{r} (0; 1,5) \\ (200; 2,25) \end{array}\right\} \Rightarrow rc = \frac{0,75}{200} = 0,00375 \Rightarrow d = 0,00375 * l + 1,5$

D3b+c) $d = 5 - 1 = 4 \Rightarrow 4 = 0,00375 * l + 1,5 \Rightarrow 2,5 = 0,00375 * l \Rightarrow l = \frac{2,5}{0,00375} = 666\frac{2}{3} ton \approx$
$667,7 ton$

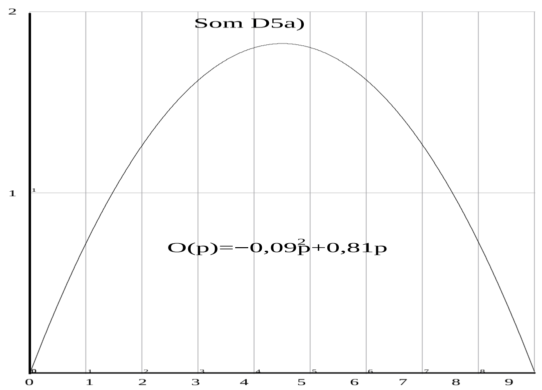
D4a) $premie = 30 * 3,65 = hfl\, 109,50$
$Belasting\ en\ Kosten = 129,50 - 109,50 = hfl\, 20,-$

D4b) $P = 3,65 * B + 20$
B in duizenden guldens, P in guldens.

D5a) $O9p) = -0,09p^2 + 0,81p\ 0 \leq p \leq 9$
Snijpunten met de $p - as : 0 = -0,09p^2 + 0,81p \xrightarrow{p\ buiten\ haakjes} 0 = p(-0,09p + 0,81) \Rightarrow$
$\Rightarrow p = 0 \bigvee -0,09p + 0,81 = 0 \Rightarrow p = 0 \bigvee 0,09p = 0,81 \Rightarrow p = 0 \bigvee p = \frac{0,81}{0,09} \Rightarrow p = 0 \bigvee p = \frac{81}{9} \Rightarrow p =$
$0 \bigvee p = 9 \longrightarrow$
$Symmetrie - as : p = 4,5$

$O(p)$ is een bergparabool $(-0,09 < 0)$

$\longrightarrow max\, O(4,5) = 0,09 * 4,5^2 = 1,8225$



p	1	2	3	4
O	0,72	1,26	1,62	1,8

5Db) zie **5Da)** Maximum bij $p = 4,5$
5Dc) Bij $p = 0$ en $p = 9$
5Dd) $p = prijs \geq 0$ De fabrikant geeft geen geld toe....... ☺
Voor $p \geq 9$ wordt er niet meer gekocht van wege de hoge prijs....er zou een negatieve omzet ontstaan
$D_0 = [0,9]$
5De) $B_0 = [0;1,8225]$
D6a) $y = \frac{150}{x^2} \longrightarrow f(x) = \frac{150}{x^2}$
D6b) $f(3) = \frac{150}{9} = \frac{50}{6} = 16\frac{2}{3} \Rightarrow$ doos 3 bij 3 bij $16\frac{2}{3}$
$f(10) = \frac{150}{100} = 1,5 \Rightarrow$ doos 10 bij 10 bij 1,5
D6c) $x = 50 \Rightarrow y = \frac{150}{2500} = \frac{15}{250} = \frac{3}{50} = 0,06$
$y = 50 \Rightarrow x^2 = \frac{150}{50} = 3 \Rightarrow x = \sqrt{3}$
$D_f = [\sqrt{50};50] \longrightarrow D_f = [0,06;50]$