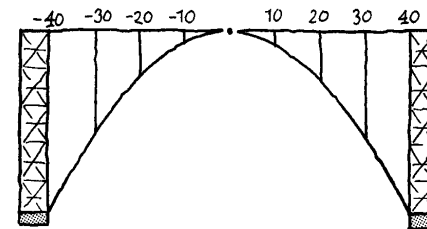


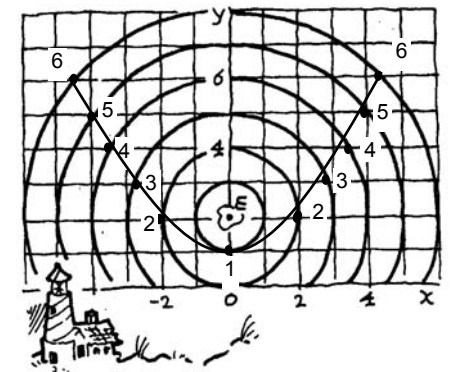
29 Parabolen en hyperbolen



$$h = 0,0625 \cdot 40^2 = 100 \text{ meter}$$

6,25 ; 25 ; 56,25 ; 100 meter

$$0,0625 \cdot 35^2 = 76,5625, \\ \text{dus } 107 - 76,5625 = 30,4375 \text{ meter}$$



5

$$\sqrt{4^2 + (5-2)^2} = 5$$

$\sqrt{(2\frac{3}{4})^2 + (3-2)^2} = \sqrt{8\frac{9}{16}} \approx 2,926..$
afstand PE < afstand P tot de x-as
Nee !

y (alleen als $y > 0$)

$$\sqrt{x^2 + (y-2)^2}$$

$$y^2 = x^2 + (y-2)^2 \\ y^2 = x^2 + y^2 - 4y + 4 \\ x^2 = 4y - 4 \text{ of ook: } y = \frac{1}{4} \cdot x^2 + 1$$

- 3: $y=3$, dus $3 = \frac{1}{4}x^2 + 1$, dus $x^2=8$,
dus $x=2\sqrt{2} \approx 2,83$ of $x=-2\sqrt{2} \approx -2,83$
- 4: $y=4$, dus $4 = \frac{1}{4}x^2 + 1$, dus $x^2=12$,
dus $x=2\sqrt{3} \approx 3,46$ of $x=-2\sqrt{3} \approx -3,46$
- 5: $y=6$, dus $6 = \frac{1}{4}x^2 + 1$, dus $x^2=20$,
dus $x=2\sqrt{5} \approx 4,47$ of $x=-2\sqrt{5} \approx -4,47$

P: de afstand tot E is $\sqrt{\frac{85}{16}} \approx 2,3$

de afstand tot k is $2\frac{1}{4}$

Q: de afstand tot E is $\sqrt{\frac{1369}{16}} = 9\frac{1}{4}$

de afstand tot k is $9\frac{1}{4}$

Dus Q ligt even ver van E als van k.

R: de afstand tot E is $\sqrt{\frac{66049}{16}} = 64\frac{1}{4}$

de afstand tot k is $64\frac{1}{4}$

Dus R ligt even ver van E als van k.

De afstand tot k is: $y + \frac{1}{4}$

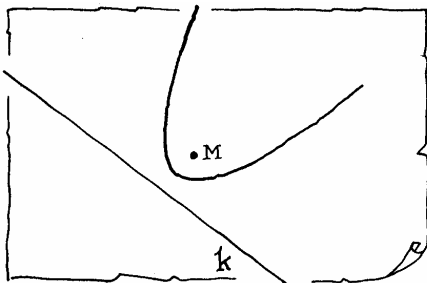
De afstand tot E is: $\sqrt{x^2 + (y - \frac{1}{4})^2}$

Dus $(y + \frac{1}{4})^2 = x^2 + (y - \frac{1}{4})^2$

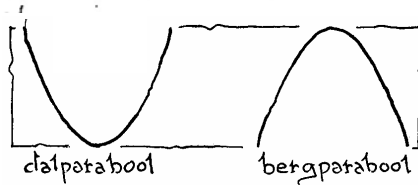
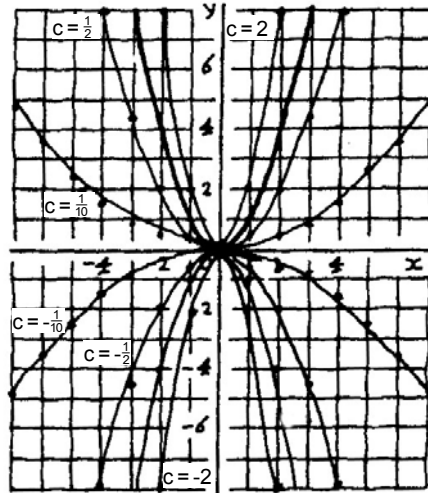
$$y^2 + \frac{1}{2}y + \frac{1}{16} = x^2 + y^2 - \frac{1}{2}y + \frac{1}{16}$$

Dus:

$$y = x^2$$



x	-2	-1	0	1	2
$\frac{1}{10}x^2$	0,4	0,1	0	0,1	0,4
$\frac{1}{2}x^2$	2	$\frac{1}{2}$	0	$\frac{1}{2}$	2
$2x^2$	8	2	0	2	8



dalparabool als: $c > 0$

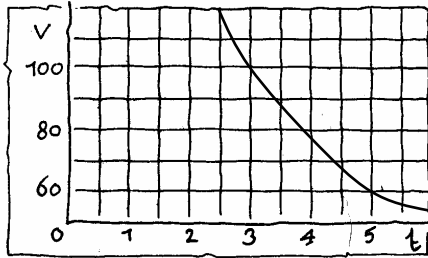
bergparabool als: $c < 0$

Ze zijn elkaars spiegelbeeld in de x-as.

De rechte lijn $y=0$ (de x-as).

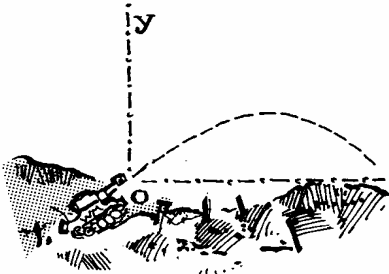
$$t = 300:120 = 2\frac{1}{2} \text{ uur}$$

$$v \cdot t = 300$$



Als v klein is

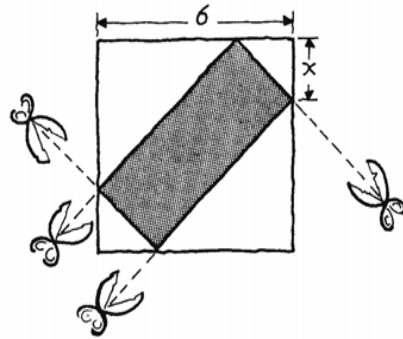
De grafiek daalt steeds minder snel.



$$y = 0 \text{ als } x = 100, \text{ dus:}$$

$$0 = a \cdot 100 - 5 \cdot 100^2, \text{ dus } a = 500$$

Vanwege symmetrie wordt de grootste hoogte bereikt als $x = 50$.
Dan is $y = 12500$, dus 12500 meter



$$-2(x^2 - 6x) = -2((x-3)^2 - 9) =$$

$$-2(x-3)^2 + 18,$$

top: (3,18)

$$x = 3$$

$$a = 1, b = -\sqrt{2}, c = -4,$$

$$\text{dus } D = 2 + 16 = 18 \text{ en } \sqrt{D} = 3\sqrt{2}$$

$$x = \frac{\sqrt{2} + 3\sqrt{2}}{2} = 2\sqrt{2} \text{ of } x = \frac{\sqrt{2} - 3\sqrt{2}}{2} = -\sqrt{2}$$

$$x^2 + 3x = 18 \text{ (gekwadrateerd)}$$

$$x^2 + 3x - 18 = 0$$

$$(x+6)(x-3) = 0$$

$$x = -6 \text{ of } x = 3$$

$$D = 9 - 4p$$

- twee oplossingen als $D > 0$, dus als $p < 2\frac{1}{4}$
- één oplossing als $D = 0$, dus als $p = 2\frac{1}{4}$
- geen oplossingen als $D < 0$, dus als $p > 2\frac{1}{4}$

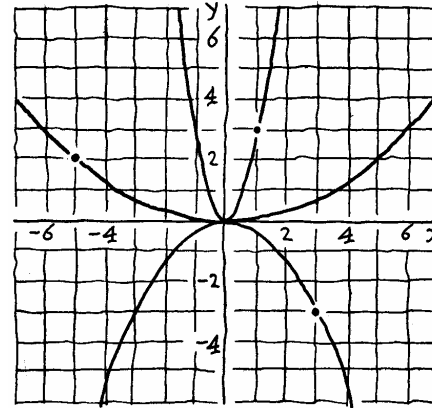
$$x^2 + (x+k)^2 = 2 \text{ heeft één oplossing, dus}$$

$$2x^2 + 2kx + k^2 - 2 = 0 \text{ heeft } D = 0$$

$$a = 2, b = 2k, c = k^2 - 2$$

$$D = (2k)^2 - 4 \cdot 2 \cdot (k^2 - 2) = 0 \Leftrightarrow -4k^2 + 16 = 0$$

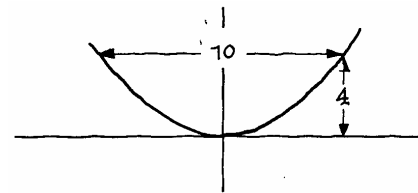
$$\text{Dus } k = 2 \text{ of } k = -2$$



(1,3) voldoet, dus $3 = c \cdot 1^2$, dus $c = 3$

(-5,2) voldoet, dus $2 = c \cdot (-5)^2$, dus $c = \frac{2}{25}$

(3, -3) voldoet, dus $c = -\frac{1}{3}$



(5,4) moet op de grafiek liggen, dus

$$4 = c \cdot 5^2, \text{ dus } c = \frac{4}{25}$$

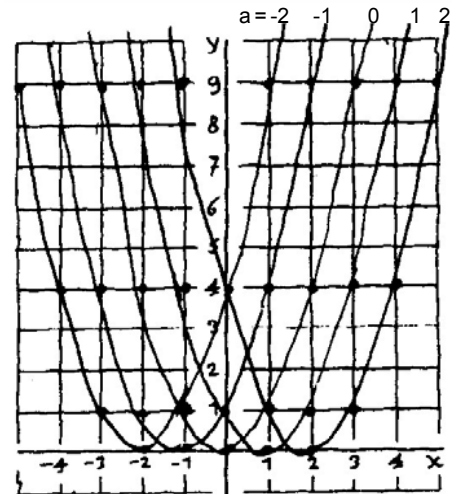
x	-3	-2	-1	0	1	2	3
y	9	4	1	0	1	4	9

x	-2	-1	0	1	2	3	4
y	9	4	1	0	1	4	9

x	-1	0	1	2	3	4	5
y	9	4	1	0	1	4	9

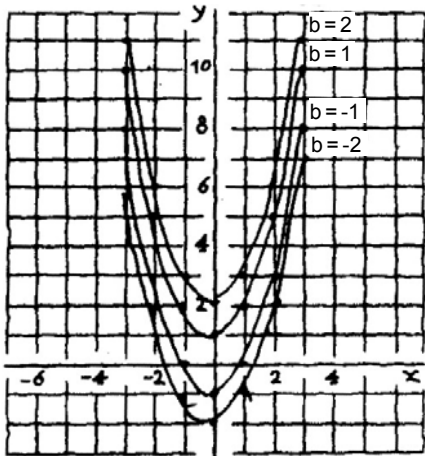
x	-4	-3	-2	-1	0	1	2
y	9	4	1	0	1	4	9

x	-5	-4	-3	-2	-1	0	1
y	9	4	1	0	1	4	9

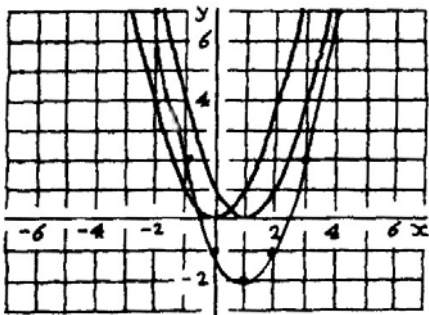


één eenheid naar rechts

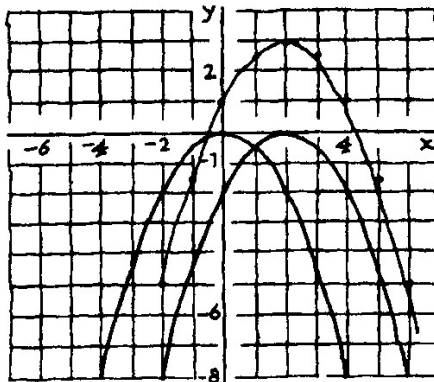
één eenheid naar links schuiven



-3	-2	-1	0	1	2	3
16	9	4	1	0	1	4
14	7	2	-1	-2	-1	2



-2	-1	0	1	2	3	4
-8	-4½	-2	-½	0	½	2
-5	-1½	1	2½	3	2½	1



De grafiek bij de formule $y = \frac{1}{2}(x-2)^2$
krijg je uit die bij $y = \frac{1}{2}x^2$ door 2 eenheden naar rechts te schuiven.

De grafiek bij de formule
 $y = \frac{1}{2}(x-2)^2 + 3$ krijg je uit die bij
 $y = \frac{1}{2}(x-2)^2$
door 3 eenheden naar boven te schuiven..

3 eenheden naar links

4 eenheden naar beneden

A: top (0,2)
 $y = c(x-0)^2 + 2 = cx^2 + 2$
(1,1) erop, dus $1 = c \cdot 1^2 + 2$, dus $c = -1$

vergelijking A: $y = -x^2 + 2$

B: top (-2,3)
 $y = c(x+2)^2 + 3$
(0,1) erop, dus $1 = c \cdot 2^2 + 3$, dus $c = -\frac{1}{2}$

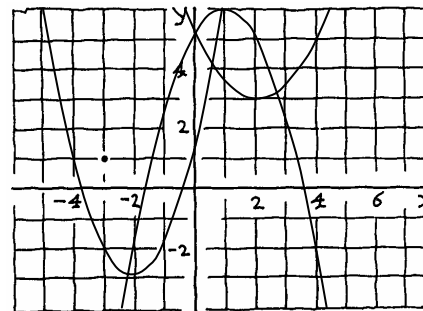
vergelijking B: $y = -\frac{1}{2}(x+2)^2 + 3$

C: top (-1,-4)
 $y = c(x+1)^2 - 4$
(0,-2) erop, dus $-2 = c \cdot 1 - 4$, dus $c = 2$

vergelijking C: $y = 2(x+1)^2 - 4$

D: top (-1,0)
 $y = c(x+1)^2$
(0,1) erop, dus $1 = c \cdot 1$, dus $c = 1$

vergelijking D: $y = (x+1)^2$



$y = (x+1\frac{1}{2})^2 - 2\frac{1}{4} + 2 = (x+1\frac{1}{2})^2 - \frac{1}{4}$

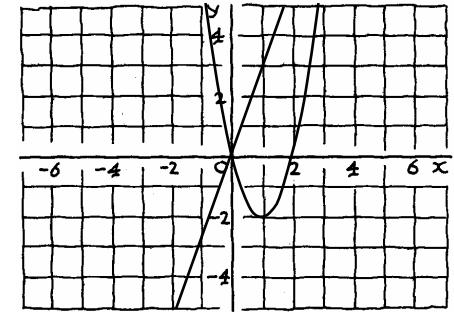
top: $(-1\frac{1}{2}, -\frac{1}{4})$

$y = -(x^2 - 4x) + 6 = -((x-2)^2 - 4) + 6 = -(x-2)^2 + 10$

top: (2,10)

$y = c \cdot (x-1)^2 - 2$
 $0 = c \cdot (2-1)^2 - 2$, dus $c = 2$

vergelijking: $y = 2(x-1)^2 - 2$



$2(x-1)^2 - 2 = 3x$ | $x = 0$ of $x = 3\frac{1}{2}$
 $2x^2 - 4x + 2 - 2 = 3x$
 $2x^2 - 7x = 0$ | snijpunten:
 $2x(x - 3\frac{1}{2}) = 0$ | (0,0) en $(3\frac{1}{2}, 10\frac{1}{2})$

$3x + p = 2x^2 - 4x$ heeft één oplossing.
 $2x^2 - 7x - p = 0$ heeft $\text{discr} = 0$
 $49 + 8p = 0$
 $p = -6\frac{1}{8}$

$a = 3$, $b = 10$, $c = 3$, dus $D = 64$

$x = \frac{-10+8}{6} = -\frac{1}{3}$ of $x = \frac{-10-8}{6} = -3$

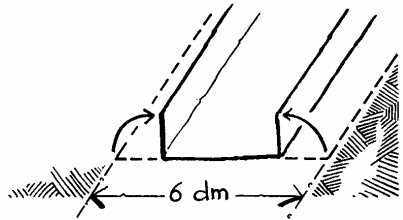
$a = 2$, $b = -5$, $c = 3$, dus $D = 1$

$x = \frac{5+1}{4} = 1\frac{1}{2}$ of $x = \frac{5-1}{4} = 1$

$a = 1$, $b = -8$, $c = 22$
 $D = 64 - 88 < 0$,
dus de vergelijking heeft geen oplossingen

$a = -5$, $b = 4$, $c = -\frac{4}{5}$, dus $D = 0$

Er is één oplossing: $x = \frac{-4}{-10} = \frac{2}{5}$



$$C = -20(x^2 - 3x) = -20((x - 1\frac{1}{2})^2 - 2\frac{1}{4}) = -20(x - 1\frac{1}{2})^2 + 45$$

top: $(1\frac{1}{2}, 45)$

bergparabool

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

$$C = 45$$

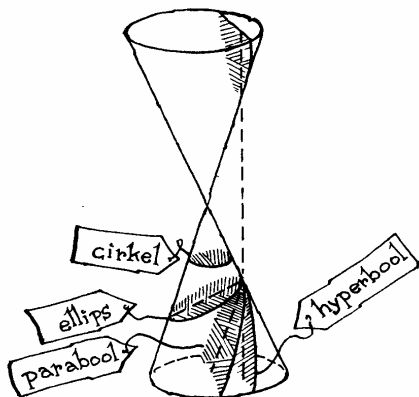
De grafiek van $(x+1)^2 + y = 4$ is parabool

De grafiek van $(x+1)^2 + y^2 = 4$ is cirkel

De grafiek van $(x+1) + y = 4$ is lijn

De grafiek van $(x+1)^2 = 0$ is lijn

De grafiek van $x = 4/y$ is hyperbool

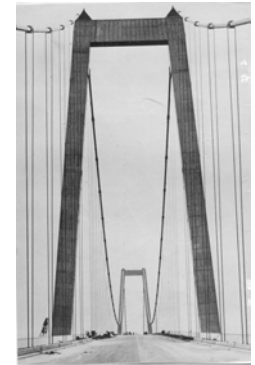


$$y = c \cdot x^2$$

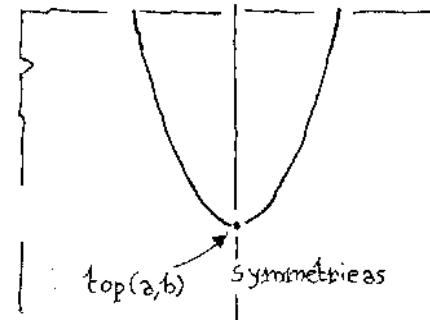
$$3 = c \cdot 4^2, \text{ dus } c = \frac{3}{16} \text{ en vergelijking is:}$$

$$y = \frac{3}{16} x^2$$

Eén van de punten heeft een eerste coördinaat $x = 3$, dan $y = \frac{3}{16} \cdot 3^2 = \frac{27}{16}$
Dus $(3, \frac{27}{16})$ en $(-3, \frac{27}{16})$

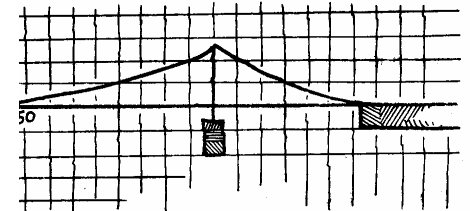


(2,3)	(-3,-4)
-------	---------



(0,3)	(-3,0)
(3,2)	(3,2)

$$\text{De laatste want } 20 = 2 \cdot (2+1)^2 + 2$$



$$y = cx^2 \text{ en } (250, 62\frac{1}{2}) \text{ voldoet, dus:}$$

$$62\frac{1}{2} = c \cdot 250^2 \text{ dus } c = \frac{1}{1000}$$

$$a = 400 \text{ en } b = 0$$

$$62\frac{1}{2} = c \cdot (250 - 400)^2, \text{ dus } c = \frac{1}{360}$$

$$y = \frac{1}{2}(x-3)^2 + 2$$

C

dalparabool met top (3,2)

$$y = -2(x-3)^2 + 2$$

D

bergparabool met top (3,2)

$$y = (x+2)^2 - 3$$

B

dalparabool met top (-2,-3)

$$y = -2(x-5)^2 - 2$$

E

bergparabool met top (5,-2)

Top is (-3,2), dus een vergelijking is

$$A: y = c(x+3)^2 + 2$$

$$(-1,0) \text{ ligt op A, dus: } 0 = c(-1+3)^2 + 2, \text{ dus } c = -\frac{1}{2}, \text{ dus}$$

$$\text{een vergelijking van A is: } y = -\frac{1}{2}(x+3)^2 + 2$$

$$y = x^2 + 2x + 4$$

$$y = (x+2)^2 - 4 - 3 = (x+2)^2 - 7$$

$$y = 2x^2 + 8x - 6$$

$$= 2(\dots x^2 + 4x - 3 \dots)$$

$$= 2((x+2)^2 - 7)$$

$$= 2(x+2)^2 - 14$$

$$(-2, -14)$$

$$y = \frac{1}{2}(x^2 + 6x + 4) =$$

$$\frac{1}{2}((x+3)^2 - 9 + 4) =$$

$$\frac{1}{2}(x+3)^2 - 2\frac{1}{2}$$

De top is dus: $(-3, -2\frac{1}{2})$.

$$-(x^2 - x) = -((x - \frac{1}{2})^2 - \frac{1}{4}) = -(x - \frac{1}{2})^2 + \frac{1}{4}$$

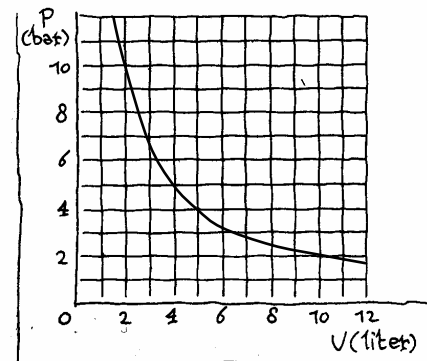
$$\text{De top is } (\frac{1}{2}, \frac{1}{4})$$

$$\begin{aligned} y &= -2((x - 2\frac{1}{2})^2 - 6\frac{1}{4}) + 1 = \\ &= -2(x - 2\frac{1}{2})^2 + 12\frac{1}{2} + 1 = \\ &= -2(x - 2\frac{1}{2})^2 + 13\frac{1}{2} \end{aligned}$$

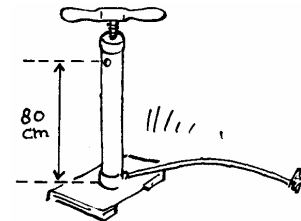
$$\text{De top is: } (2\frac{1}{2}, 13\frac{1}{2})$$

$$\text{De top is: } (-2, 4)$$

$$\begin{aligned} 5 \cdot 4 &= c, \text{ dus } c = 20 \\ 3 \cdot p &= 20, \text{ dus } p = 6\frac{2}{3} \text{ bar} \end{aligned}$$



$$\frac{20}{3} = 6\frac{2}{3}, \text{ dus als } v > 6\frac{2}{3}$$



$$\text{Inhoud} = \pi \cdot 0,3^2 \cdot 8 \approx 2,2619 \text{ dm}^3$$

$$C = 0,980 \cdot 2,2619 = 2,216662$$

$$\text{Volume} = h \cdot 0,3^2 \cdot \pi$$

Dus:

$$h \cdot 0,09\pi \cdot p = 2,216662,$$

dus op twee decimalen:

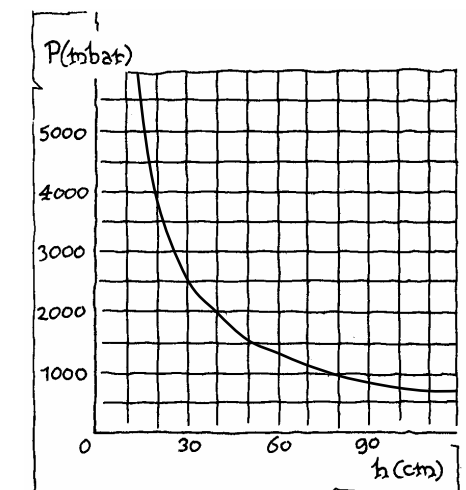
$$p \cdot h = 7,84$$

$$p \cdot 5 = 7,84$$

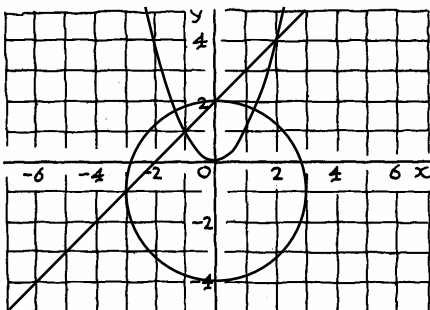
$$p = 2,63 \text{ bar}$$

$$h \cdot 3 = 7,84,$$

$$h = 2,61 \text{ dm, dus } 26,1 \text{ cm hoog}$$



$$x^2 + (y + 1)^2 = 9; \text{ middelpunt } (0, -1), \text{ straal } 3$$



$$\begin{aligned} x^2 + (x+3)^2 &= 9 \\ x^2 + x^2 + 6x + 9 &= 9 \\ 2x(x+3) &= 0 \\ x &= 0 \text{ of } x = -3 \\ \text{snijpunten } &(0, 2) \text{ en } (-3, -1) \end{aligned}$$

$$\begin{aligned} x^2 &= x + 2 \\ x^2 - x - 2 &= 0 \\ (x-2)(x+1) &= 0 \\ x &= 2 \text{ of } x = -1 \\ \text{snijpunten } &(2, 4) \text{ en } (-1, 1) \end{aligned}$$

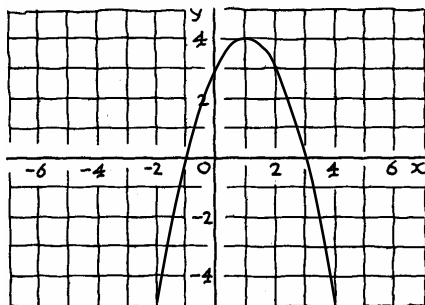
$$\begin{aligned} x^2 + y^2 + 2y &= 8 \text{ en } x^2 = y, \\ \text{dus:} \\ y + y^2 + 2y &= 8, \text{ dus } y^2 + 3y - 8 = 0 \end{aligned}$$

$$y = \frac{-3 + \sqrt{41}}{2} \text{ of } y = \frac{-3 - \sqrt{41}}{2}$$

Alleen de eerste voldoet, dus $y \approx 1,70$

$$\begin{aligned} y &= -x^2 + 2x + 3 = \\ &= -(x^2 - 2x) + 3 = \\ &= -((x-1)^2 - 1) + 3 = \\ &= -(x-1)^2 + 4 \end{aligned}$$

top (1,4)



alle waarden kleiner of gelijk aan 4

$$\begin{aligned} x^2 - 4x - 5 &= 0 \\ (x+1)(x-5) &= 0 \\ x &= -1 \text{ of } x = 5 \text{ snijpunten } (-1, 0) \text{ en } (5, 0) \end{aligned}$$

De symmetrie-as loopt precies tussen deze twee punten, dus $x = 2$.

Als $x = 2$, dan, dan $y = 9$, de top is: (2,9).

$$\begin{aligned} x &= -\frac{11}{6} + \sqrt{\frac{121}{36} - \frac{8}{3}} = -\frac{11}{6} + \sqrt{\frac{121}{36} - \frac{96}{36}} = -\frac{11}{6} + \frac{5}{6} = -1 \text{ of} \\ x &= -\frac{11}{6} - \sqrt{\frac{121}{36} - \frac{8}{3}} = -\frac{11}{6} - \frac{5}{6} = -2\frac{2}{3} \end{aligned}$$

$$\begin{aligned} x &= -\frac{9}{5 \cdot 2} + \sqrt{\left(\frac{9}{5 \cdot 2}\right)^2 - \frac{2}{5}} \text{ of} \\ x &= -\frac{9}{5 \cdot 2} - \sqrt{\left(\frac{9}{5 \cdot 2}\right)^2 - \frac{2}{5}} \end{aligned}$$

$$\begin{aligned} x &= -\frac{9}{10} + \sqrt{\frac{81}{100} - \frac{40}{100}} = -\frac{9}{10} + \sqrt{\frac{41}{100}} = -\frac{9}{10} + \frac{1}{10}\sqrt{41} \text{ of} \\ x &= -\frac{9}{10} - \frac{1}{10}\sqrt{41} \end{aligned}$$

$$x = -\frac{b}{2a} + \sqrt{\left(\frac{b}{2a}\right)^2 - \frac{c}{a}} \text{ of } x = -\frac{b}{2a} - \sqrt{\left(\frac{b}{2a}\right)^2 - \frac{c}{a}}$$

$$\begin{aligned} x &= \frac{5}{4} + \sqrt{\frac{25}{16} + \frac{25}{4}} = \frac{5}{4} + \sqrt{\frac{225}{16}} = \frac{5}{4} + \frac{15}{4} = 5 \\ x &= \frac{5}{4} - \frac{15}{4} = -2\frac{1}{2} \end{aligned}$$

$$\begin{aligned} 2 \cdot 5^2 - 5 \cdot 5 - 25 &= 0 \\ 2 \cdot (-2\frac{1}{2})^2 - 5 \cdot (-2\frac{1}{2}) - 25 &= 12\frac{1}{2} + 12\frac{1}{2} - 25 = 0 \\ \text{Klopt!} \end{aligned}$$

$$\begin{aligned} (x-1)(x+3) &= 0 \\ x &= 1 \text{ of } x = -3 \end{aligned}$$

$$\begin{aligned} x &= -\frac{2}{2} + \sqrt{\left(\frac{2}{2}\right)^2 + \frac{3}{1}} = -1 + \sqrt{4} = -1 + 2 = 1 \\ \text{of} \\ x &= -1 - 2 = -3 \end{aligned}$$

$$\begin{aligned} x^2 + 4x + 5 &= (x+2)^2 - 4 + 5 = (x+2)^2 + 1 = 0, \\ \text{dus} \\ (x+2)^2 &= -1 \text{ en dat kan voor geen enkele } x. \end{aligned}$$

$$\begin{aligned} x &= -\frac{4}{2} + \sqrt{\left(\frac{4}{2}\right)^2 - 5} = -2 - \sqrt{-1} \text{ of} \dots \\ \text{maar } \sqrt{-1} &\text{ bestaat niet...} \end{aligned}$$

stap 1: $\frac{b}{2a} \cdot \frac{b}{2a} = \frac{b^2}{4a^2}$

stap 2: $\frac{c}{a} \cdot \frac{4a}{4a} = \frac{4ac}{4a^2}$

stap 3: twee breuken met dezelfde noemer optellen: de noemer zo laten en de tellers optellen.

$2a \cdot 2a = 4a^2$ en $-2a \cdot -2a = 4a^2$
De wortel van een getal is niet negatief.

Als $a > 0$ $-\frac{b}{2a} + \sqrt{\frac{D}{4a^2}} = -\frac{b}{2a} + \frac{\sqrt{D}}{2a}$

en: $-\frac{b}{2a} - \sqrt{\frac{D}{4a^2}} = -\frac{b}{2a} - \frac{\sqrt{D}}{2a}$

Als $a < 0$ $-\frac{b}{2a} + \sqrt{\frac{D}{4a^2}} = -\frac{b}{2a} + \frac{\sqrt{D}}{-2a}$

en: $-\frac{b}{2a} - \sqrt{\frac{D}{4a^2}} = -\frac{b}{2a} - \frac{\sqrt{D}}{-2a}$

1. $D = 2^2 - 4 \cdot 1 \cdot 3 = -8$

2. $D = 3^2 - 4 \cdot -1 \cdot 2 = 17$

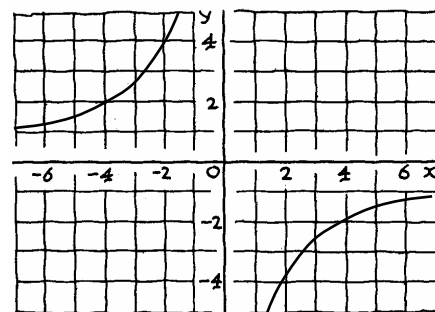
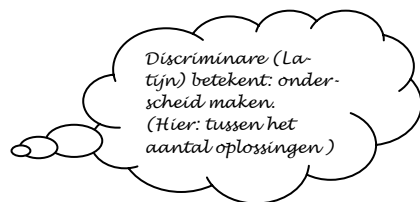
3. $D = 20^2 - 4 \cdot 4 \cdot 25 = 0$

1. geen oplossingen

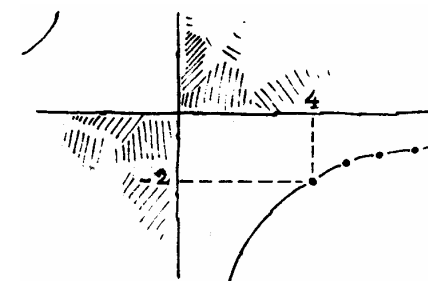
2. $x = \frac{-3 + \sqrt{17}}{-2}$ en $x = \frac{-3 - \sqrt{17}}{-2}$

3. $x = -\frac{20}{8} = -2\frac{1}{2}$

Dan staat er een lineaire vergelijking.



$4\sqrt{2} \cdot -\sqrt{2} = -4 \cdot \sqrt{4} = -8$
 $-\sqrt{8} \cdot 2\sqrt{2} = -2\sqrt{16} = -2 \cdot 4 = -8$ dus alleen het laatste niet.
 $-2\frac{1}{2} \cdot 3\frac{1}{5} = -\frac{5}{2} \cdot \frac{16}{5} = -8,$
 $\pi \cdot -2,6 = -8,17$



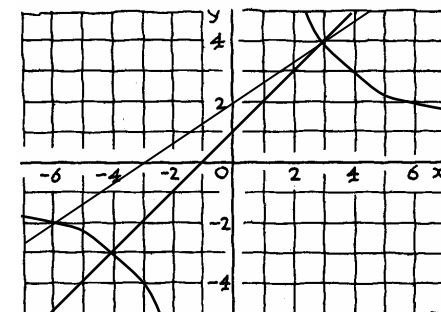
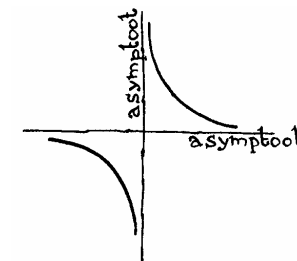
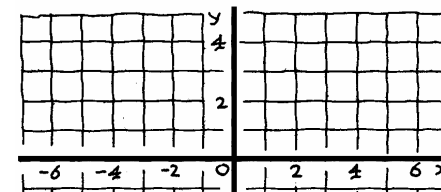
$(4, -2)$

$(40, -0,2)$

$(400, -0,02)$

$(4000, -0,002)$

de y-as



$a^2 + a - 12 = 0$

$(a+4)(a-3) = 0$

$a = -4$, dan $a+1 = -3$, geeft snijpunt $(-4, -3)$

$a = 3$, dan $a+1 = 4$, geeft snijpunt $(3, 4)$

$(-4, -3)$ en $(3, 4)$

$y = \frac{2}{3}x + 2$

$x(\frac{2}{3}x + 2) = 12$

$\frac{2}{3}x^2 + 2x - 12 = 0$

$x^2 + 3x - 18 = 0$

$(x+6)(x-3) = 0$

$x = -6$ of $x = 3$

Snijpunten $(-6, -2)$ en $(3, 4)$

4 keer zo groot

Bij vergrotingsfactor 2 wordt de oppervlakte 4 keer zo groot.

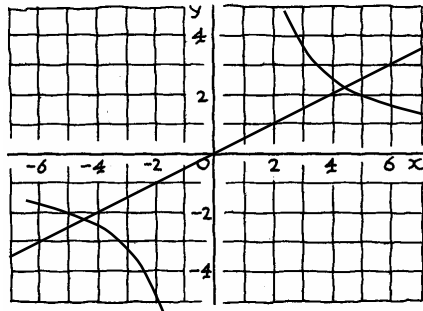
$$5,25 \cdot 7,50 \cdot 0,34 = 13,39 \text{ euro}$$

$$k = 0,25 \cdot x \cdot y$$

$$13,5 = 0,25 \cdot 6 \cdot y, \text{ dus } y = 9$$

Wat is de breedte van een lokaal waarvan lengte 6 m is en het schoonmaken € 13,50 kost.

$$\frac{8,02}{8,3 \cdot 4,2} = 0,23 \text{ euro per m}^2$$



$$\begin{aligned} \sqrt{20} \cdot \sqrt{5} &= 10 \\ -\sqrt{10} \cdot -\sqrt{10} &= 10 \\ 8 \cdot 1\frac{1}{4} &= 10 \\ -1\frac{1}{2} \cdot -7 &\neq 10, \text{ dus alleen het eerste punt niet.} \end{aligned}$$

$(\underline{6}, \underline{\frac{5}{3}})$	$(\underline{2\sqrt{5}}, \underline{\sqrt{5}})$
$(\underline{-4}, \underline{-2\frac{1}{2}})$	$(\underline{-5\sqrt{2}}, \underline{-\sqrt{2}})$

$$(\sqrt{10}, \sqrt{10}) \text{ en } (-\sqrt{10}, -\sqrt{10})$$

$$y = \frac{1}{2}x \text{ (of } 2y = x)$$

$$a \cdot \frac{1}{2}a = 10$$

$$a^2 = 20$$

$$a = 2\sqrt{5} \text{ of } a = -2\sqrt{5}$$

$$\text{Dus: } (2\sqrt{5}, \sqrt{5}) \text{ en } (-2\sqrt{5}, -\sqrt{5})$$

$$\begin{aligned} a &= 2, b = 4, c = -1, \text{ dus } D = 24 \text{ en } \sqrt{D} = 2\sqrt{6} \\ x &= \frac{-4 \pm 2\sqrt{6}}{4} = \text{of } x = \frac{-4 - 2\sqrt{6}}{4}, \text{ dus} \\ x &= -1 + \frac{1}{2}\sqrt{6} \text{ of } x = -1 - \frac{1}{2}\sqrt{6} \end{aligned}$$

$$\begin{aligned} a &= 7, b = -6, c = 1, \text{ dus } D = 8 \text{ en } \sqrt{D} = 2\sqrt{2}. \\ x &= \frac{6 \pm 2\sqrt{2}}{14} = \frac{3}{7} + \frac{1}{7}\sqrt{2} \text{ of } x = \frac{3}{7} - \frac{1}{7}\sqrt{2} \end{aligned}$$

$$\begin{aligned} a &= 7, b = -6, c = 2, D = -20 \\ \text{Geen oplossingen want } D < 0. \end{aligned}$$

$$a = \frac{1}{2}, b = -3, c = -4\frac{1}{2}, \text{ dus } D = 18 \text{ en } \sqrt{D} = 3\sqrt{2}.$$

$$x = 3 + 3\sqrt{2} \text{ of } x = 3 - 3\sqrt{2}$$

$$4x^2 - 4x + 1 = 0, \text{ dus } a = 4, b = -4 \text{ en } c = 1$$

$$D = 0, \text{ dus er is één oplossing: } x = \frac{1}{2}$$

$$\begin{aligned} x^2 - 3x + 4 &= 0, \\ D &= 9 - 16 < 0, \text{ dus er zijn geen oplossingen.} \end{aligned}$$

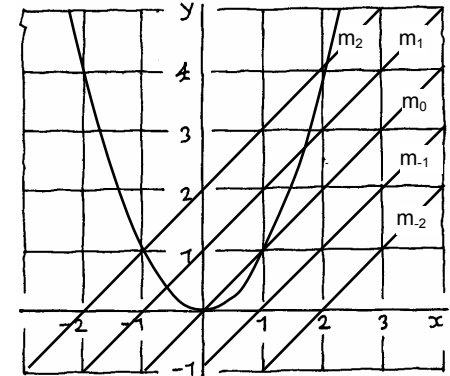
$$-3x^2 + 5x = 0, a = -3, b = 5, c = 0, \text{ dus } D = 25.$$

$$x = \frac{-5 \pm \sqrt{25}}{-6} = 0 \text{ of } x = \frac{-5 - \sqrt{25}}{-6} = 1\frac{2}{3}$$

$$\begin{aligned} x + 3 &= 4 \text{ of } x + 3 = -4 \\ x &= 1 \text{ of } x = -7 \end{aligned}$$

$$\begin{aligned} x + 1 &= 2x + 3 \text{ of } x + 1 = -2x - 3 \\ x &= -2 \text{ of } x = 1\frac{1}{3} \end{aligned}$$

$$\begin{aligned} (x + 5)(x + 1) &= 0 \\ x &= -5 \text{ of } x = -1 \end{aligned}$$



$$\begin{aligned} x^2 &= x \\ x^2 - x &= 0 \\ x(x - 1) &= 0, \text{ dus } x = 0 \text{ of } x = 1, \\ \text{dus } (0, 0) \text{ en } (1, 1) &\text{ zijn de snijpunten met } m_0 \end{aligned}$$

$$\begin{aligned} x^2 &= x + 2 \\ x^2 - x - 2 &= 0 \\ (x + 1)(x - 2) &= 0, \text{ dus } x = -1 \text{ of } x = 2, \\ \text{dus } (2, 4) \text{ en } (-1, 1) &\text{ zijn de snijpunten met } m_2 \end{aligned}$$

$$\begin{aligned} x^2 &= x - 2 \\ x^2 - x + 2 &= 0; D < 0, \text{ dus er zijn geen snijpunten met } m_{-2} \end{aligned}$$

Alle hebben rc 1.

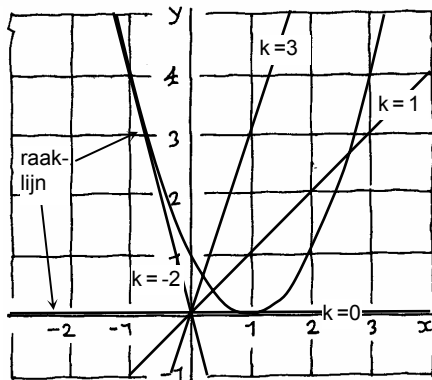
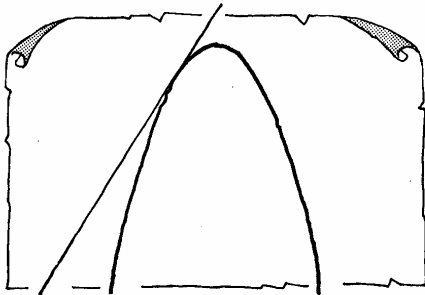
$1 - 8 = -7$	$1 - 4 = -3$	$1 - 0 = 1$	$1 + 4 = 5$
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$$(-1)^2 - 4 \cdot -k = 1 + 4k$$

Als $1 + 4k = 0$, dus als $k = -\frac{1}{4}$

$$x^2 - x + \frac{1}{4} = 0 \Leftrightarrow (x - \frac{1}{2})^2 = 0 \Leftrightarrow x = \frac{1}{2}$$

Dus $(\frac{1}{2}, \frac{1}{4})$



Omdat $0 = k \cdot 0^2$ klopt, wat je ook voor k neemt.

$k=0$

$k=-2\frac{1}{2}$

De verticale lijn.

$$x^2 - 2x + 1 = kx$$

$$x^2 - 2x - kx + 1 = 0$$

$$x^2 - (2+k)x + 1 = 0$$

$$a = 1, b = -(k+2), c = 1$$

$$D = (-(k+2))^2 - 4 = (2+k)^2 - 4$$

Als $k = 1$, dan $D = 5$, dus twee snijpunten

$$D = 0, \text{ dus } (2+k)^2 = 4 \Leftrightarrow 2+k = 2 \text{ of } 2+k = -2$$

Dus $k = 0$ of $k = -4$.

$$a = \sqrt{3}, b = 3, c = -6\sqrt{3}, \text{ dus } D = 81.$$

$$x = \frac{-3-9}{2\sqrt{3}} = -2\sqrt{3} \text{ of } x = \frac{-3+9}{2\sqrt{3}} = \sqrt{3}$$

$$x^2 + 5x + 4 = 0 \Leftrightarrow (x+1)(x+4) = 0$$

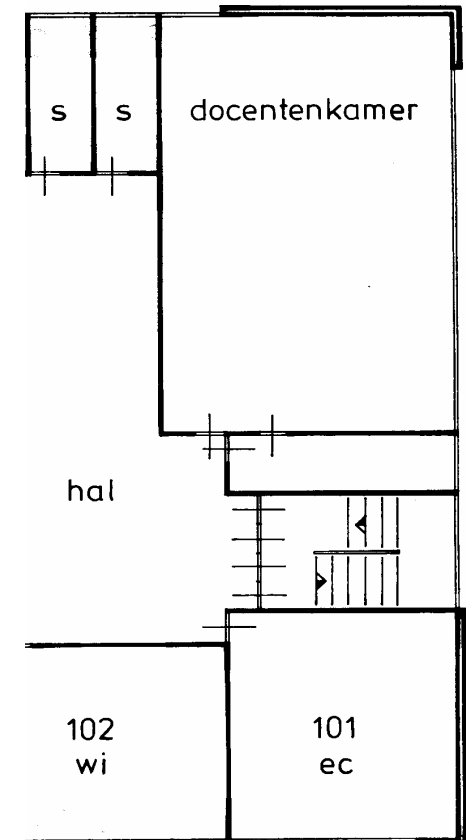
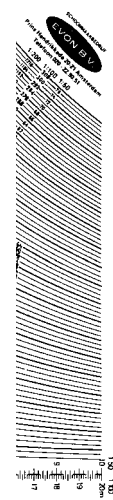
$$x = -1 \text{ of } x = -4$$

$$D = k^2 - 16$$

$$D = 0 \text{ als } k = 4 \text{ of } k = -4$$

$$x^2 + 4x + 4 = 0 \Leftrightarrow (x+2)^2 = 0 \Leftrightarrow x = -2$$

(Dus er is inderdaad één oplossing als $k = 4$.)



128 m²

40 m²

54 m²

Het een is het dubbele van het andere.

Bij schaal 1 : 50 is de werkelijke afstand 2 keer zo groot als bij 1 : 100