

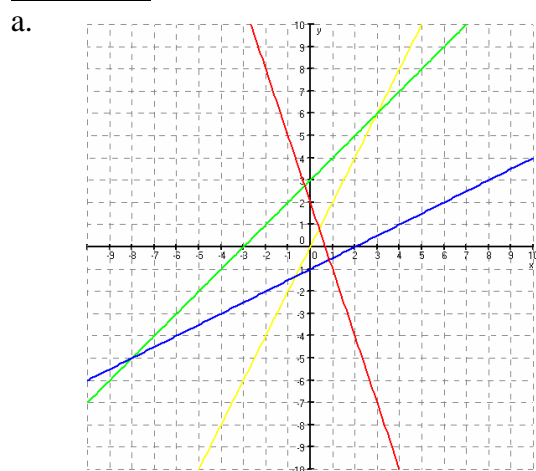
Hoofdstuk 2: Functies en grafieken.

2.1 Lineaire functies

Opgave 1:

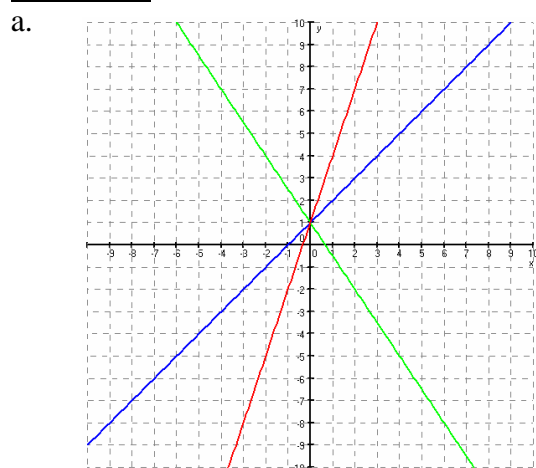
- $d = 21$
- $t = 1,75$ dus $d = 28,5$ m
- -10 : de diepte wordt 10 m/min minder, dus hij stijgt 10 m/min
46: op $t = 0$ is de diepte 46 m, dus het wrak ligt op 46 m diepte
- $-10t + 46 = 0$
 $-10t = -46$
 $t = 4,6$ minuut dus na 4 minuten en 36 seconden

Opgave 2:

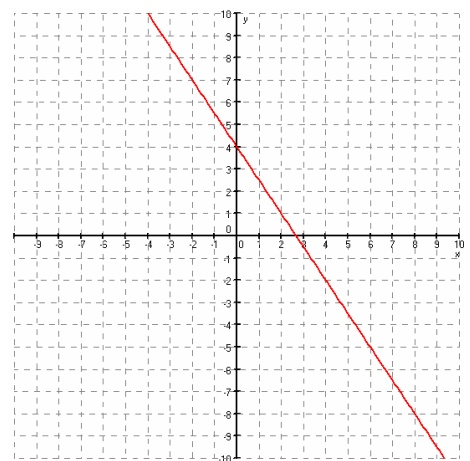


- b. $rc_k = -3$ $rc_m = 0,5$ $rc_n = 1$ $rc_p = 2$

Opgave 3:

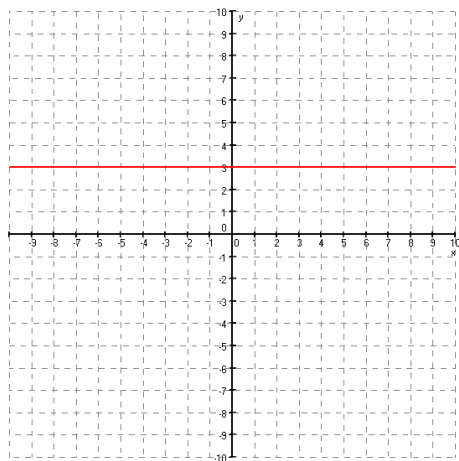


- b. $k: y = 3x + 1$ $l: y = x + 1$ $m: y = -1,5x + 1$
c. $n: y = -1,5x + 4$



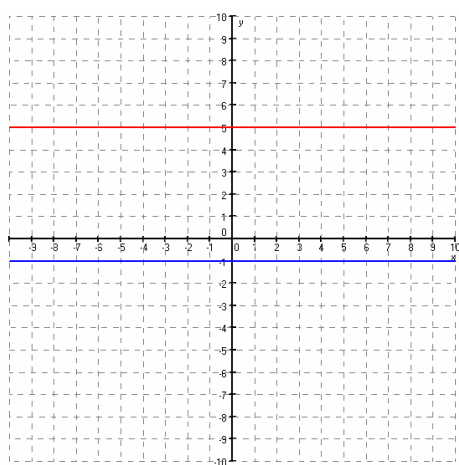
Opgave 4:

a.



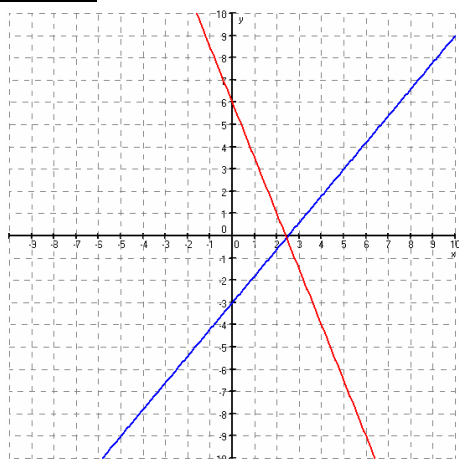
$$l: y = 3$$

b.



Opgave 5:

a.



b. $A = (0,6)$

$$rc_k = rc_q = 1,2$$

$$k: y = 1,2x + 6$$

c. $rc_l = rc_p = -2,5$

$$l: y = -2,5x$$

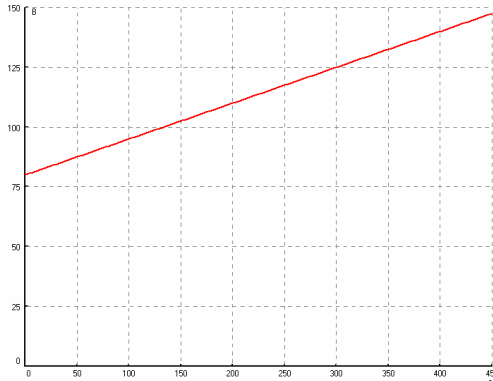
d. $B = (0,-3)$ dus $m: y = -3$

Opgave 6:

a. $B = 0,15 \cdot 50 + 80 = 87,5$

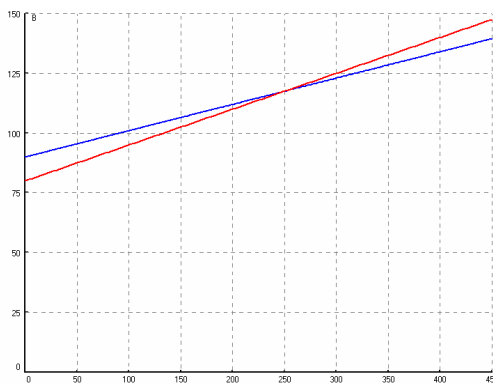
b. bij iedere afstand a die je rijdt hoort een bedrag B , dus a is de onafhankelijke variabele.

c.



d. 0,15 is de prijs per kilometer en 80 is de vaste huurprijs per dag

e.



f. Rent-a-car: $B = 0,15 \cdot 150 + 80 = 102,5$

Avis: $B = 0,11 \cdot 150 + 90 = 106,5$

dus Rent-a-car is het voordeligst, het verschil is € 4,-.

g. $0,15a + 80 > 0,11a + 90$

$$0,04a > 10$$

$$a > 250 \text{ dus boven de 250 km}$$

Opgave 7:

a. $h = -10t + 180$

b. $l = -5t + 25$

c. $B = 15n + 40$

Opgave 8:

$$\text{beginhoogte} = 70 - 18 \cdot 3 = 16$$

$$h = 3t + 16$$

Opgave 9:

a. $L = 0,125t + 163$

b. $0,125t + 163 = 168$

$$0,125t = 5$$

$$t = 40 \text{ dus in 1940}$$

Opgave 10:

- a. $y = -2x + b$ door $(-2,3)$
 $3 = 4 + b$
 $b = -1$
 $l: y = -2x - 1$
- b. $rc_k = rc_m = 4$
 $y = 4x + b$ door $(-5,21)$
 $21 = -20 + b$
 $b = 41$
 $k: y = 4x + 41$

Opgave 11:

- a. $rc_p = rc_q = -\frac{1}{3}$
 $y = -\frac{1}{3}x + b$ door $(-18,30)$
 $30 = 6 + b$
 $b = 24$
 $p: y = -\frac{1}{3}x + 24$
- b. x -as: $-\frac{1}{3}x + 24 = 0$
 $-\frac{1}{3}x = -24$
 $x = 72$ dus $(72,0)$
 y -as: $(0,24)$

Opgave 12:

- a. $rc_n = rc_p = -2,5$
 $y = -2,5x + b$ door $(18,50)$
 $50 = -45 + b$
 $b = 95$
 $n: y = -2,5x + 95$
- b. x -as: $-2,5x + 95 = 0$
 $-2,5x = -95$
 $x = 38$ dus $P = (38,0)$
 y -as: $Q = (0,95)$
- c. $y_R = -2,5 \cdot -20 + 95 = 145$
- d. $-2,5x_S + 95 = 45$
 $-2,5x_S = -50$
 $x_S = 20$

Opgave 13:

- $3 \cdot 8 - 27 = 24 - 27 = -3$
 $5 - 8 = -3$
Dus Ronald heeft gelijk.

Opgave 14:

- a. $5x - 3 = -12$
 $5x = -9$
 $x = -1,8$
- b. $5x + 12 = 3x$
 $2x = -12$
 $x = -6$
- c. $7x - 8 = 3x - 20$
 $4x = -12$
 $x = -3$
- d. $1,8x + 0,6 = -1,2x + 3$
 $3x = 2,4$
 $x = 0,8$
- e. $2(x - 6) = 5 - 3x$
 $2x - 12 = 5 - 3x$
 $5x = 17$
 $x = 3,4$
- f. $17(2x - 3) - 12x = 8 - (x - 10)$
 $34x - 51 - 12x = 8 - x + 10$
 $23x = 69$
 $x = 3$

Opgave 15:

- a. $-0,8x + 3 = 1,7x - 4,25$
 $-2,5x = -7,25$
 $x = 2,9$
 $S = (2,9; 0,68)$
- b. $-0,8x + 3 = 0$
 $-0,8x = -3$
 $x = 3,75$ dus $A = (3,75; 0)$
- c. $1,7x - 4,25 = 0$
 $1,7x = 4,25$
 $x = 2,5$ dus $B = (2,5; 0)$

Opgave 16:

- a. $-1,8x + 6 = 1,2x + 3,6$
 $-3x = -2,4$
 $x = 0,8$
 $S = (0,8; 4,56)$
- b. $-1,8x + 6 = 2,4$ $1,2x + 3,6 = 2,4$
 $-1,8x = -3,6$ $1,2x = -1,2$
 $x_A = 2$ $x_B = -1$
dus $AB = 2 - (-1) = 3$
- c. $-1,8x + 6 = 0$ $1,2x + 3,6 = 0$
 $-1,8x = -6$ $1,2x = -3,6$

$$x_C = 3\frac{1}{3} \qquad x_D = -3$$

$$\text{dus } CD = 3\frac{1}{3} - (-3) = 6\frac{1}{3}$$

Opgave 17:

- a. $L_v = -0,95 \cdot 38 + 80,9 = 44,8$ dus $38 + 44,8 = 82,8$ jaar
- b. in 2003 was Stephanie 16 jaar
 $L_v = -0,95 \cdot 16 + 80,9 = 65,7$ dus $16 + 65,7 = 81,7$ jaar
- c. $-0,95t + 80,9 = 39,1$
 $-0,95t = -41,8$
 $t = 44$ dus 44 jaar
- d. $-0,96t + 76,2 = 18,6$
 $-0,96t = -57,6$
 $t = 60$ dus 60 jaar
- e. Yvonne: $L_v = -0,95 \cdot 28 + 80,9 = 54,3$
Leon: $L_m = -0,96 \cdot 28 + 76,2 = 49,32$
dus $54,3 - 49,32 = 4,98$ dus bijna 5 jaar
- f. $L_m = t + -0,96t + 76,2 = 0,04t + 76,2$

Opgave 18:

- a. $0,6l - 40 = 65$
 $0,6l = 105$
 $l = 175$ cm
- b. $88 : 1,3 = 67,7$ $88 : 1,1 = 80$
 $0,7l - 55 = 67,7$ $0,7l - 55 = 80$
 $0,7l = 122,7$ $0,7l = 135$
 $l = 175,3$ $l = 192,9$
Dus hij is minimaal 175,3 cm en maximaal 192,9 cm.
- c. $G = 0,7 \cdot 180 - 55 = 71$
 $71 \cdot 1,4 = 99,4$ dus minimaal 99,4 kg
- d. $G_M = G_S + 3$
 $0,7l - 55 = 0,6l - 40 + 3$
 $0,1l = 18$
 $l = 180$ dus Sophie is 180 cm

Opgave 19:

- a. $N_{aut} = 15760 - 360t$
 $N_{all} = 4680 + 415t$
- b. $15760 - 360t = 4680 + 415t$
 $-775t = -11080$
 $t = 14,29$ dus in april 2009
- c. $N_{tot} = N_{aut} + N_{all} = 15760 - 360t + 4680 + 415t$
 $N_{tot} = 20440 + 55t$
- d. 40% autochtoon en 60% allochtoon dus $N_{all} = 1,5 \cdot N_{aut}$

$$4680 + 415t = 1,5(15760 - 360t)$$

$$4680 + 415t = 23640 - 540t$$

$$955t = 18960$$

$$t = 19,9 \text{ dus in } 2014$$

2.2 Lineaire formules opstellen

Opgave 20:

- a. $\frac{3}{4}$ omhoog dus $rc_l = \frac{3}{4}$
- b. $y_B - y_A = 4 - 1 = 3$
- c. $rc_l = \frac{y_B - y_A}{x_B - x_A} = \frac{3}{4}$

Opgave 21:

- a. $rc = \frac{\Delta y}{\Delta x} = \frac{4-1}{1-(-1)} = 1\frac{1}{2}$
 $y = 1\frac{1}{2}x + b$ door (1,4)
 $4 = 1\frac{1}{2} + b$
 $b = 2\frac{1}{2}$
 $l: y = 1\frac{1}{2}x + 2\frac{1}{2}$
- b. $rc = \frac{\Delta y}{\Delta x} = \frac{0-5}{2-(-3)} = -1r$
 $y = -x + b$ door (2,0)
 $0 = -2 + b$
 $b = 2$
 $k: y = -x + 2$
- c. $rc = \frac{\Delta y}{\Delta x} = \frac{3-3}{-7-5} = 0$
 $y = b$ door (5,3)
 $3 = b$
 $m: y = 3$
- d. $rc = \frac{\Delta y}{\Delta x} = \frac{250-360}{160-180} = 5\frac{1}{2}$
 $y = 5\frac{1}{2}x + b$ door (180,360)
 $360 = 990 + b$
 $b = -630$
 $n: y = 5\frac{1}{2}x - 630$

Opgave 22:

- a. $rc = \frac{\Delta y}{\Delta x} = \frac{4-2}{5-1} = \frac{1}{2}$
 $y = \frac{1}{2}x + b$ door (1,2)
 $2 = \frac{1}{2} + b$
 $b = 1\frac{1}{2}$
 $k: y = \frac{1}{2}x + 1\frac{1}{2}$
- b. $rc = \frac{\Delta y}{\Delta x} = \frac{40-20}{90-50} = \frac{1}{2}$
 $y = \frac{1}{2}x + b$ door (50,20)
 $20 = 25 + b$

$$b = -5$$

$$l: y = \frac{1}{2}x - 5$$

$$c. \quad rc = \frac{\Delta y}{\Delta x} = \frac{450 - 350}{5 - 1} = 25$$

$$y = 25x + b \text{ door } (1,350)$$

$$350 = 25 + b$$

$$b = 325$$

$$m: y = 25x + 325$$

Opgave 23:

$$a. \quad rc = \frac{\Delta y}{\Delta x} = \frac{-9 - -5}{7 - -3} = -0,4$$

$$y = -0,4x + b \text{ door } (7,-9)$$

$$-9 = -2,8 + b$$

$$b = -6,2$$

$$l: y = -0,4x - 6,2$$

$$b. \quad rc = \frac{\Delta y}{\Delta x} = \frac{155 - -125}{17 - -23} = 7$$

$$y = 7x + b \text{ door } (17,155)$$

$$155 = 119 + b$$

$$b = 36$$

$$m: y = 7x + 36$$

$$c. \quad rc_{EF} = \frac{\Delta y}{\Delta x} = \frac{-30 - -27}{12 - 18} = 0,5$$

$$y = 0,5x + b \text{ door } (0,0)$$

$$0 = b$$

$$p: y = 0,5x$$

$$d. \quad rc_{OH} = \frac{\Delta y}{\Delta x} = \frac{4 - 0}{-12 - 0} = -\frac{1}{3}$$

$$y = -\frac{1}{3}x + b \text{ door } (-8,14)$$

$$14 = \frac{8}{3} + b$$

$$b = 11\frac{1}{3}$$

$$q: y = -\frac{1}{3}x + 11\frac{1}{3}$$

Opgave 24:

$$a. \quad rc = \frac{\Delta R}{\Delta q} = \frac{350 - 270}{500 - 350} = 0,3$$

$$b. \quad \text{€ } 0,30$$

$$c. \quad R = 0,3q + b \text{ door } (500,315)$$

$$315 = 150 + b$$

$$b = 165 \text{ dus € } 165,-$$

Opgave 25:

$$a. \quad rc = \frac{\Delta A}{\Delta s} = \frac{750 - 300}{21 - 15} = 75$$

$$A = 75s + b \text{ door } (15,300)$$

$$300 = 1125 + b$$

$$b = -825$$

$$A = 75s - 825$$

$$\text{b. } rc = \frac{\Delta R}{\Delta t} = \frac{35 - 10}{60 - 35} = 1$$

$$R = t + b \text{ door } (35,10)$$

$$10 = 35 + b$$

$$b = -25$$

$$R = t - 25$$

Opgave 26:

$$\text{a. } rc = \frac{\Delta p}{\Delta q} = \frac{2,25 - 7,75}{425 - 150} = -0,02$$

$$p = -0,02q + b \text{ door } (150; 7,75)$$

$$7,75 = -3 + b$$

$$b = 10,75$$

$$p = -0,02q + 10,75$$

$$\text{b. } p = -0,02q + 10,75$$

$$0,02q = -p + 10,75$$

$$q = -50p + 537,5$$

$$\text{c. } p = -0,02 \cdot 250 + 10,75 = 5,75$$

$$\text{d. } q = 50 \cdot 4,25 + 527,5 = 325$$

Opgave 27:

$$\text{a. } q = a \cdot p + b$$

$$rc = \frac{\Delta q}{\Delta p} = \frac{315 - 380}{145 - 120} = -2,6$$

$$q = -2,6p + b \text{ door } (120,380)$$

$$380 = -312 + b$$

$$692 = b$$

$$q = -2,6p + 692$$

$$\text{b. } q = -2,6 \cdot 180 + 692 = 224$$

$$\text{c. } -2,6q + 692 < 445$$

$$-2,6q < -247$$

$$p > 95 \text{ dus boven de } \text{€ } 95,-$$

Opgave 28:

$$\text{a. } k = a \cdot V + b$$

$$rc = \frac{\Delta k}{\Delta V} = \frac{49,6 - 56}{650 - 250} = -0,016$$

$$k = -0,016V + b \text{ door } (250,56)$$

$$56 = -4 + b$$

$$60 = b$$

$$k = -0,016V + 60$$

b. $-0,016V + 60 = 5$
 $-0,016V = -55$
 $V = 3437,5$

Opgave 29:

a. $L_m = a \cdot t + b$

$$rc = \frac{\Delta L}{\Delta t} = \frac{185 - 173}{100 - 40} = 0,2$$

$$L_m = 0,2t + b \text{ door } (40,173)$$

$$173 = 8 + b$$

$$165 = b$$

$$L_m = 0,2t + 165$$

b. $L_v = 0,2t + 152$

c. $L_v = 0,2 \cdot 150 + 152 = 182 \text{ cm}$

d. $L = a \cdot l + b$

$$rc = \frac{\Delta L}{\Delta l} = \frac{-8}{60} = -0,133$$

$$L = -0,133l + b \text{ door } (20,176)$$

$$176 = -2,667 + b$$

$$178,667 = b$$

$$L = -0,133l + 178,667$$

Opgave 30:

a. $B = a \cdot w + b$

$$rc = \frac{\Delta B}{\Delta w} = \frac{145,89 - 120,13}{112 - 89} = 1,12$$

$$B = 1,12w + b \text{ door } (112;145,89)$$

$$145,89 = 125,44 + b$$

$$20,45 = b$$

$$B = 1,12w + 20,45$$

b. vastrecht € 20,45

prijs per m³ water € 1,12

c. $B = 1,12 \cdot 97 + 20,45 = 129,09$

d. $1,12w + 20,45 = 161,57$

$$1,12w = 141,12$$

$$w = 126 \text{ dus } 126 \text{ m}^3$$

Opgave 31:

a. $h = a \cdot t + b$

$$rc = \frac{\Delta h}{\Delta t} = \frac{235 - 245,6}{4} = -2,65$$

$$h = -2,65t + b \text{ door } (11;245,6)$$

$$245,6 = -29,15 + b$$

$$274,75 = b$$

$$h = -2,65t + 274,75$$

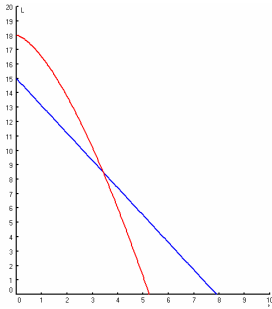
- b. $h = -2,65 \cdot 6 + 274,75 = 258,85$ km
- c. $t = 9,25$
 $h = -2,65 \cdot 9,25 + 274,75 = 250,2$ km
- d. $-2,65t + 274,75 = 220$
 $-2,65t = -54,75$
 $t = 20,66$ dus 22 maart

2.3 Wiskundige modellen

Opgave 32:

a. $t = 4$

b.



c. $t = 0,5$ dus $L_I = 17,5$ cm

$t = 1\frac{5}{6}$ dus $L_I = 14,3$ cm

d. $t = 2\frac{2}{3}$ dus $L_{II} = 9,9$ cm

e. intersect levert $t = 3,42$ dus 23.25 uur
de kaarsen zijn dan 8,5 cm

f. $t = 1,58$ dus na 95 minuten
kaars I is dan 15,0 cm

g. de optie zero levert $t = 5,24$ dus na 314 minuten
kaars II is dan 5,0 cm

h. $y_1(2,5) - y_2(2,5) = 1,8$ cm

Opgave 33:

a. $t = 0$ geeft $d = 27$

b. $X_{\max} = 100$ en $Y_{\max} = 30$

c. intersect geeft $t = 47$ minuten

d. Sandra $d = 2,7$

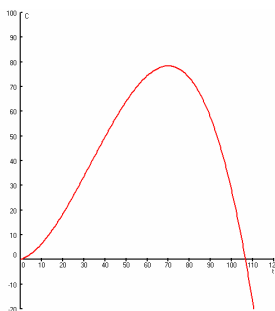
Martijn $d = 24$

dus $24 - 2,7 = 21,3$ km

e. optie zero geeft $t = 90$
Sandra heeft dan $0,27 \cdot 90 = 24,3$ km afgelegd

Opgave 34:

a.

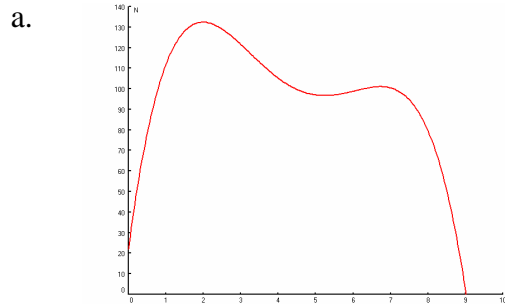


b. 11,85 mg/l

c. neem $y_2 = 50$ intersect geeft $x = 40,26$ \vee $x = 93,0$
dus $93,0 - 40,26 = 52,7$ minuten

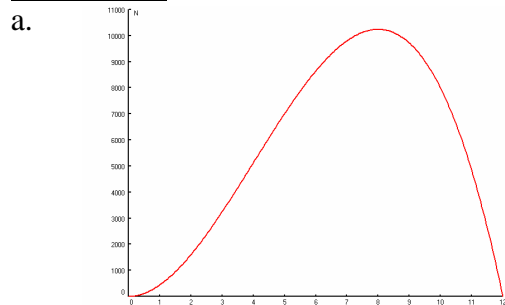
- d. de optie maximum geeft $t = 70$; $C_{\max} = 78,4$ mg/l
- e. de optie zero geeft $t = 106,6$ dus na 107 minuten
- f. neem $y_2 = 25$ intersect geeft $t = 101$ minuten

Opgave 35:



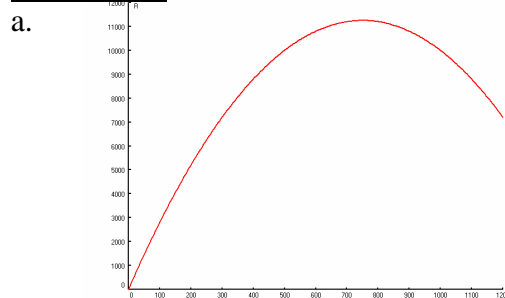
- b. 122
- c. $t = 1,75$ dus $N = 131$
- d. de optie maximum geeft $t = 1,99$ dus 10.59 uur
 $N_{\max} = 132$
- e. de optie zero geeft $t = 9,02$ dus 18.01 uur
- f. neem $y_2 = 100$ intersect geeft:
 $t = 0,79$ dus 9.47 uur ; $t = 4,46$ dus 13.28 uur ; $t = 6,28$ dus 15.17 uur en $t = 7,07$ dus 16.04 uur

Opgave 36:



- b. $t = 3\frac{5}{6}$ dus $N = 4800$
- c. de optie maximum geeft $t = 8$ dus 17.00 uur
 $N_{\max} = 10240$
- d. neem $y_2 = 8000$ intersect geeft $t = 5,58$ dus 14.35 uur of $t = 10$ dus 19.00 uur

Opgave 37:



b.

q	R
0	0
200	5200
400	8800
600	10800
800	11200
1000	10000
1200	7200

c. de optie maximum geeft $q = 750$

$$R_{\max} = 11250 \text{ dus } \text{€ } 11250,-$$

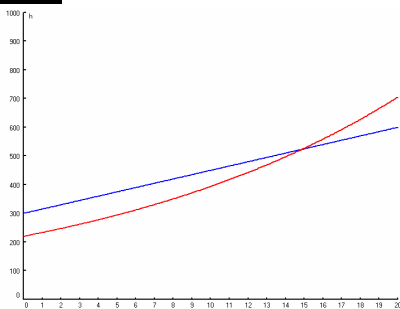
d. neem $y_2 = 8000$ intersect geeft $x = 347 \vee x = 1153$
dus van 347 tot en met 1153

e. de fabrikant heeft dan geen winst of verlies
intersect geeft $q = 134 \vee q = 1116$

f. $q = 600$ geeft $R = 10800$ en $K = 6000$
dus $W = R - K = 10800 - 6000 = 4800$ dus € 4800,-

Opgave 38:

a.



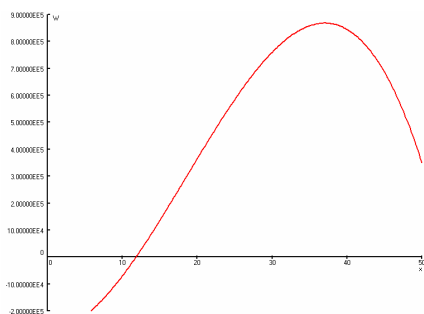
b. $h_I = 294,4$ en $h_{II} = 375$ dus $375 - 294,4 = 81$ cm dus boom II is langer (!)

$$h_I = 705,6 \text{ en } h_{II} = 600 \text{ dus } 705,6 - 600 = 106 \text{ cm}$$

c. intersect geeft $t = 14,86$ dus in 2016, de bomen zijn dan 523 cm

Opgave 39:

a.



b. neem $y_2 = 500000$ intersect geeft $x = 23 \vee x = 48,1$
dus € 230000,- of € 481000,-

c. neem $y_2 = 600000$ intersect geeft $x = 25,4 \vee x = 46,6$
dus de reclamekosten liggen tussen € 254000,- en € 466000,-

d. de optie maximum geeft $W_{\max} = 868118$ dus € 868118

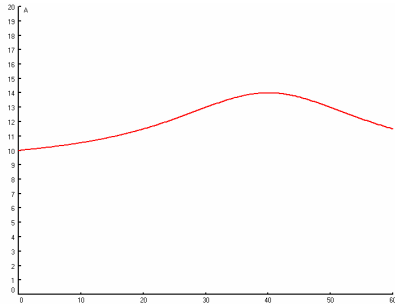
e. $x = 23$ dus $W = 499985$

$$x = 46 \text{ dus } W = 634880$$

$$\text{dus de toename is } \frac{634880 - 499985}{499985} \cdot 100\% = 27,0\%$$

Opgave 40:

a.



b. de optie maximum geeft $t = 40$ en $A = 14$ dus de verkoop is dan 14000 stuks

c. neem $y_2 = 13,5$ intersect geeft $x = 33,33 \quad \vee \quad x = 46,67$

dus $46,67 - 33,33 = 13$ weken

2.4 Vergelijkingen en ongelijkheden

Opgave 41:

Intersect geeft $x = -1,83 \vee x = 3,83$

Opgave 42:

- a. $x^2 + 6 = 5x$
 $x^2 - 5x + 6 = 0$
 $(x - 2)(x - 3) = 0$
 $x = 2 \vee x = 3$
- b. $x^2 = x$
 $x^2 - x = 0$
 $x(x - 1) = 0$
 $x = 0 \vee x = 1$
- c. $x^2 = 11$
 $x = \sqrt{11} = 3,32 \vee x = -\sqrt{11} = -3,32$
- d. $t^2 + 5t = 14$
 $t^2 + 5t - 14 = 0$
 $(t - 2)(t + 7) = 0$
 $t = 2 \vee t = -7$
- e. $3q^2 - 18q = 0$
 $3q(q - 6) = 0$
 $q = 0 \vee q = 6$
- f. $3a^2 = 18$
 $a^2 = 6$
 $a = \sqrt{6} = 2,45 \vee a = -\sqrt{6} = -2,45$

Opgave 43:

- a. $5x^2 + 15x - 50 = 0$
 $x^2 + 3x - 10 = 0$
 $(x + 5)(x - 2) = 0$
 $x = -5 \vee x = 2$
- b. $0,5x^2 - 2x = 6$
 $0,5x^2 - 2x - 6 = 0$
 $x^2 - 4x - 12 = 0$
 $(x - 6)(x + 2) = 0$
 $x = 6 \vee x = -2$
- c. $0,02a^2 - 80a = 0$
 $0,02a(a - 4000) = 0$
 $a = 0 \vee a = 4000$
- d. $2p^2 - 5p = 3,4p$
 $2p^2 - 8,4p = 0$
 $2p(p - 4,2) = 0$

$$p = 0 \quad \vee \quad p = 4,2$$

Opgave 44:

a. $2x^2 = 9x + 5$

$$2x^2 - 9x - 5 = 0$$

$$x = \frac{9 \pm \sqrt{81 + 40}}{4} = \frac{9 \pm \sqrt{121}}{4} = \frac{9 \pm 11}{4}$$

$$x = \frac{9 + 11}{4} = 5 \quad \vee \quad x = \frac{9 - 11}{4} = -\frac{1}{2}$$

b. $y_1 = 2x^2$ en $y_2 = 9x + 5$

intersect geeft $x = -0,5 \quad \vee \quad x = 5$

c. *

d. $y_1 = 5x^2 + 13x$ en $y_2 = x^2 - 9$

intersect geeft $x = -1 \quad \vee \quad x = -2,25$

e. $y_1 = 0,3x^2 + 2x$ en $y_2 = -1,6x^2 + 8$

intersect geeft $x = 1,59 \quad \vee \quad x = -2,64$

Opgave 45:

a. $x^2 - 5x = 0$

$$x(x - 5) = 0$$

$$x = 0 \quad \vee \quad x = 5$$

b. $x^2 - 5x = 24$

$$x^2 - 5x - 24 = 0$$

$$(x - 8)(x + 3) = 0$$

$$x = 8 \quad \vee \quad x = -3$$

c. $-0,004x^2 - 120x = 0$

$$-0,004x(x - 30000) = 0$$

$$x = 0 \quad \vee \quad x = 30000$$

d. $(2x - 1)(3x + 12) = 0$

$$2x = 1 \quad \vee \quad 3x = -12$$

$$x = 0,5 \quad \vee \quad x = -4$$

e. $(x + 3)^2 - (x + 1)^2 = 8$

$$x^2 + 6x + 9 - (x^2 + 2x + 1) = 8$$

$$x^2 + 6x + 9 - x^2 - 2x - 1 = 8$$

$$4x = 0$$

$$x = 0$$

f. $(x + 4)^2 = 2x + 16$

$$x^2 + 8x + 16 = 2x + 16$$

$$x^2 + 6x = 0$$

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

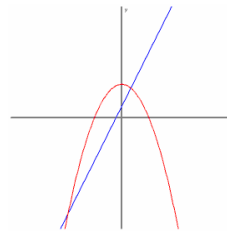
$$x = 0 \quad \vee \quad x = -6$$

Opgave 46:

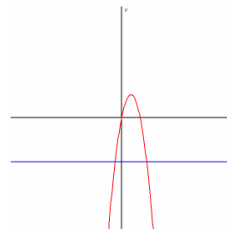
Hij maakt winst als $R > K$ dus $90 < q < 460$

Opgave 47:

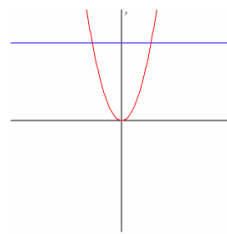
- a. $y_1 = -0,5x^2 + 3$ en $y_2 = 2x + 1$
 intersect geeft $x = -4,83 \vee x = 0,83$
 dus $x < -4,83 \vee x > 0,83$



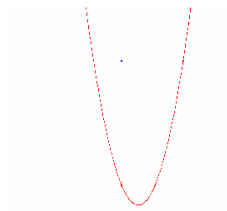
- b. $y_1 = -3x^2 + 5x$ en $y_2 = -4$
 intersect geeft $x = -0,59 \vee x = 2,26$
 dus $-0,59 < x < 2,26$



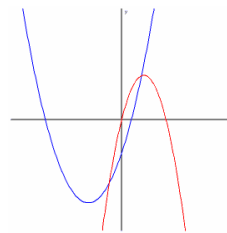
- c. $y_1 = x^2$ en $y_2 = 7$
 intersect geeft $x = -2,65 \vee x = 2,65$
 dus $x \leq -2,65 \vee x \geq 2,65$



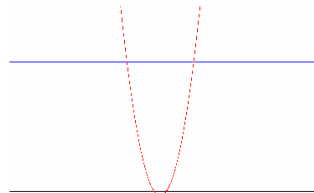
- d. $y_1 = x^2 - 3x$ en $y_2 = 14$
 intersect geeft $x = -2,53 \vee x = 5,53$
 dus $-2,53 \leq x \leq 5,53$

**Opgave 48:**

- a. $y_1 = -x^2 + 4x$ en $y_2 = 0,5x^2 + 3x - 3$
 intersect geeft $x = -1,12 \vee x = 1,79$
 dus $x < -1,12 \vee x > 1,79$



- b. $y_1 = 8x^2 + 6x$ en $y_2 = 35$
 intersect geeft $x = -2,5 \vee x = 1,75$
 dus $x \leq -2,5 \vee x \geq 1,75$



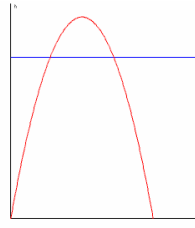
Opgave 49:

$$-5t^2 + 15t > 9$$

neem $y_1 = -5x^2 + 15x$ en $y_2 = 9$

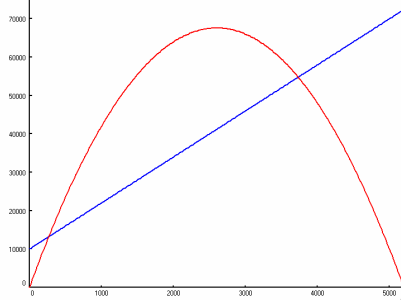
intersect geeft $x = 0,83 \vee x = 2,17$

dus $\Delta t = 2,17 - 0,83 = 1,3$ sec



Opgave 50:

a.



b. intersect geeft $q = 267,9 \vee q = 3732,1$

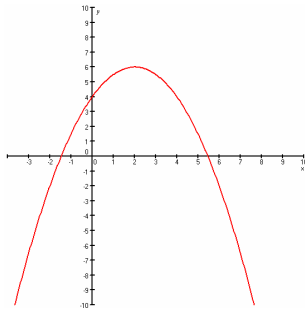
dus vanaf 268 stuks tot en met 3732 stuks

c. het bedrijf lijdt verlies als $O < K$ dus bij een verkoop van minder dan 268 stuks of meer dan 3732 stuks

2.5 Kwadratische formules.

Opgave 51:

a.



$$y_1 = -0,5x^2 + 2x + 4$$

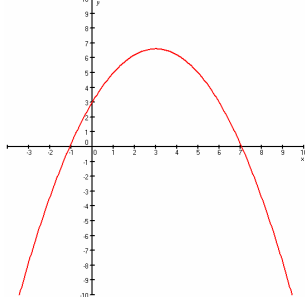
optie maximum geeft: (2,6)

b. 6

c. het getal voor de x^2 is negatief

Opgave 52:

a.



$$y_1 = -0,4x^2 + 2,4x + 3$$

b. optie maximum geeft: maximum $f(3) = 6,6$

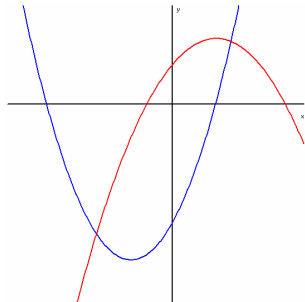
c. $x = 3$

d. $f(-3,6) = -10,824$ en $f(1,7) = 5,924$

e. neem $y_2 = 4$ de optie intersect levert: $x = 0,45 \vee x = 5,55$

Opgave 53:

a.



$$y_1 = -0,25x^2 + 2x + 6$$

$$y_2 = 0,4x^2 + 3x - 18$$

b. de optie maximum geeft: maximum $f(4) = 10$

c. de optie minimum geeft: minimum $g(-3,75) = -23,625$

d. $f(-3) = -2,25$ en $g(-3) = -23,4$

dus $AB = -2,25 - -23,4 = 21,15$

Opgave 54:

a. $-0,04q^2 + 96q = 0$

$$q(-0,04q + 96) = 0$$

$$q = 0 \vee -0,04q = -96$$

$$q = 0 \vee q = 2400$$

- b. $X_{\min} = 0$ en $X_{\max} = 2400$
 c. $y_1 = -0,04x^2 + 96x$ de optie maximum geeft $y = 57600$ dus $R_{\max} = 57600$
 d. $y_2 = 38000$ de optie intersect geeft: $x = 500 \vee x = 1900$
 dus $500 < q < 1900$

Opgave 55:

- a. $y_1 = -0,008x^2 + 32x$ de optie maximum geeft $R_{\max} = 32000$
 b. $y_1 = 0,038x(84 - x)$ de optie maximum geeft $T_{\max} = 67,032$
 c. $y_1 = -0,02x^2 + 0,36x + 0,8$ de optie maximum geeft $y_{\max} = 2,42$

Opgave 56:

- a. $h = 0,021x(192 - x) = 0$
 $x = 0 \vee x = 192$ dus 192 meter
 b. maximum bij $x = 96$ en dan geldt $h_{\max} = 193,5$ meter
 c. $y_2 = 165$ de optie intersect geeft $x = 59,14 \vee x = 132,86$
 dus $132,84 - 59,14 = 73,7$ meter

Opgave 57:

- a. $q = 300 - 2 \cdot 10 = 280$ kaartjes
 $R = p \cdot q = 6 \cdot 280 = 1680$ euro
 b. $q = 300 + 3 \cdot 10 = 330$ kaartjes
 $R = p \cdot q = 3,5 \cdot 330 = 1155$ euro
 c. $a = \frac{\Delta p}{\Delta q} = \frac{5,5 - 5}{290 - 300} = -0,05$
 d. $p = -0,05q + b$ door $(300,5)$
 $5 = -15 + b$
 $20 = b$
 $p = -0,05q + 20$

Opgave 58:

- a. $R = p \cdot q = (-5q + 360) \cdot q = -5q^2 + 360q$
 $W = R - K = -5q^2 + 360q - (40q + 2000)$
 $= -5q^2 + 360q - 40q - 2000$
 $= -5q^2 + 320q - 2000$
 b. $q = 26$ geeft $W = 2940$ euro
 c. $p = 210$ dus $-5q + 360 = 210$
 $-5q = -150$
 $q = 30$
 $W = 3100$ euro
 d. $y_1 = -5x^2 + 360x$ en $y_2 = 3600$
 de optie intersect geeft: $q = 12 \vee q = 60$
 e. $y_1 = -5x^2 + 360x$ de optie maximum geeft $R_{\max} = 6480$ euro voor $q = 36$
 f. $y_1 = -5x^2 + 320x - 2000$ de optie minimum geeft $W_{\max} = 3120$ euro voor $q = 32$

$$p = -5 \cdot 32 + 360 = 200 \text{ euro}$$

Opgave 59:

a. als $p = 1,3$ dan $q = 700$

als $p = 1,4$ dan $q = 650$

$$p = a \cdot q + b$$

$$a = \frac{\Delta p}{\Delta q} = \frac{1,4 - 1,3}{650 - 700} = -0,002$$

$$p = -0,002q + b \text{ door } (700; 1,3)$$

$$1,3 = -1,4 + b$$

$$2,7 = b$$

$$p = -0,002q + 2,7$$

b. $R = p \cdot q = (-0,002q + 2,7) \cdot q = -0,002q^2 + 2,7q$

c. $y_1 = -0,002x^2 + 2,7x$ de optie maximum geeft $x = 675$ dus $q = 675$

dan is $p = -0,002 \cdot 675 + 2,7 = 1,35$ euro

d. $K = 0,6q + 50$

e. $W = R - K = -0,002q^2 + 2,7q - (0,6q + 50)$

$$= -0,002q^2 + 2,7q - 0,6q - 50$$

$$= -0,002q^2 + 2,1q - 50$$

f. $y_1 = -0,002x^2 + 2,1x - 50$ de optie maximum geeft $x = 525$ en $y = 501,25$

dus $W_{\max} = 501,25$ euro voor $q = 525$

dan is $p = -0,002 \cdot 525 + 2,7 = 1,65$ euro

Opgave 60:

a. als $p = 20$ dan $q = 300$

als $p = 22,5$ dan $q = 280$

$$p = a \cdot q + b$$

$$a = \frac{\Delta p}{\Delta q} = \frac{22,5 - 20}{280 - 300} = -0,125$$

$$p = -0,125q + b \text{ door } (300, 20)$$

$$20 = -37,5 + b$$

$$57,5 = b$$

$$p = -0,125q + 57,5$$

b. $R = p \cdot q = (-0,125q + 57,5) \cdot q = -0,125q^2 + 57,5q$

c. $y_1 = -0,125x^2 + 57,5x$ de optie maximum geeft $x = 230$ dus $q = 230$

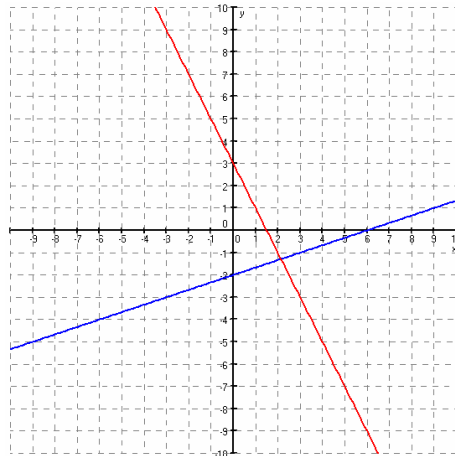
dan is $p = -0,125 \cdot 230 + 57,5 = 28,75$ euro

2.6 Diagnostische toets

Opgave 1:

$$rc_l = -2 \text{ door } (0,3)$$

$$rc_m = \frac{1}{3} \text{ door } (0,-2)$$



Opgave 2:

a. $rc_k = rc_l = -\frac{1}{2}$

$$y = -\frac{1}{2}x + b \text{ door } (9,3)$$

$$3 = -4\frac{1}{2} + b$$

$$b = 7\frac{1}{2}$$

$$k: y = -\frac{1}{2}x + 7\frac{1}{2}$$

b. $y = b$ door $(-1,6)$

$$6 = b$$

$$m: y = 6$$

c. snijpunt x-as: $y = 0$

$$8x + 5 = 0$$

$$8x = -5$$

$$x = -0,625 \text{ dus } A(-0,625;0)$$

snijpunt y-as: $x = 0$

$$y = 5 \text{ dus } B(0,5)$$

Opgave 3:

a. $6x - 13 = 4x$

$$2x = 13$$

$$x = 6,5$$

b. $1,5x + 2,1 = 6,3 - 1,3x$

$$2,8x = 4,2$$

$$x = 1,5$$

c. $5 - 3(x - 1) = 8 - (2x - 1)$

$$5 - 3x + 3 = 8 - 2x + 1$$

$$-x = 1$$

$$x = -1$$

d. $0,25(x - 3) = 2x + 1$

$$0,25x - 0,75 = 2x + 1$$

$$-1,75x = 1,75$$

$$x = -1$$

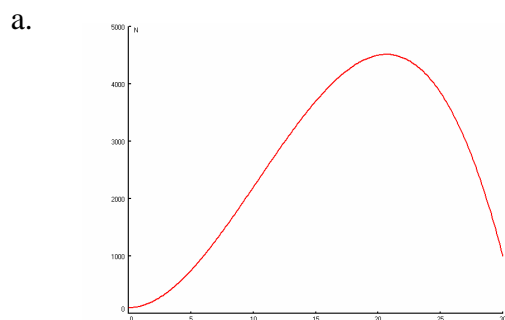
Opgave 4:

- a. $rc = \frac{\Delta y}{\Delta x} = \frac{-2 - 2}{3 - -5} = -0,5$
 $y = -0,5x + b$ door $(-5, 2)$
 $2 = 2,5 + b$
 $b = -0,5$
 $k: y = -0,5x - 0,5$
- b. $rc = \frac{\Delta y}{\Delta x} = \frac{135 - 60}{65 - 40} = 3$
 $y = 3x + b$ door $(40, 60)$
 $b = -60$
 $l: y = 3x - 60$

Opgave 5:

- a. als $p = 7,5$ dan $t = 800$
als $p = 9,75$ dan $t = 665$
 $rc = \frac{\Delta t}{\Delta p} = \frac{665 - 800}{9,75 - 7,5} = -60$
 $t = -60p + b$ door $(7,5; 800)$
 $800 = -450 + b$
 $b = 1250$
 $t = -60p + 1250$
- b. $t = -60 \cdot 11,25 + 1250 = 575$
- c. $-60p + 1250 > 1000$
 $-60p > -250$
 $p < 4,167$ dus als de prijs € 4,16 of lager is.

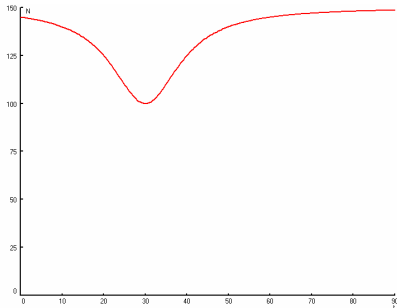
Opgave 6:



- b. 10 juni 12.00 uur is $t = 9,5$
 $N(9,5) = 2040$
- c. de optie maximum geeft $x = 20,67$ dus op 21 juni, $N_{\max} = 4513$
- d. $y_2 = 3000$ de optie intersect geeft $x = 12,5 \vee x = 27,0$
dus vanaf 13 juni tot en met 28 juni

Opgave 7:

a. $y_1 = 150 - 50 \div ((0.1x - 3)^2 + 1)$



b. de optie minimum geeft $x = 30$ dus na 30 dagen

c. $y_2 = 110$ de optie intersect geeft $x = 25 \vee x = 35$
dus gedurende 10 dagen

d. $N(0) = 145$

$y_2 = 145$ de optie intersect geeft $x = 60$ dus na 60 dagen

Opgave 8:

a. $3x^2 - x = 0$

$$x(3x - 1) = 0$$

$$x = 0 \vee 3x = 1$$

$$x = 0 \vee x = \frac{1}{3}$$

b. $3x^2 - 9x = 12$

$$3x^2 - 9x - 12 = 0$$

$$x^2 - 3x - 4 = 0$$

$$(x - 4)(x + 1) = 0$$

$$x = 4 \vee x = -1$$

c. $3x^2 - x = 2$

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

$$x = \frac{1 \pm \sqrt{1 + 24}}{6} = \frac{1 \pm \sqrt{25}}{6} = \frac{1 \pm 5}{6}$$

$$x = \frac{1 + 5}{6} = 1 \vee x = \frac{1 - 5}{6} = -\frac{2}{3}$$

d. $x^2 + 4 = 16$

$$x^2 = 12$$

$$x = \sqrt{12} = 3,46 \vee x = -\sqrt{12} = -3,46$$

e. $x^2 + 2(2x - 6) = -3$

$$x^2 + 4x - 12 = -3$$

$$x^2 + 4x - 9 = 0$$

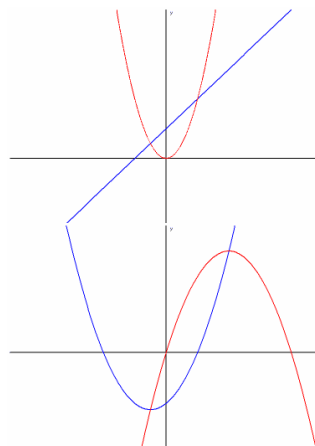
$$x = \frac{-4 \pm \sqrt{16 + 36}}{2} = \frac{-4 \pm \sqrt{52}}{2}$$

$$x = \frac{-4 + \sqrt{52}}{2} = 1,61 \vee x = \frac{-4 - \sqrt{52}}{2} = -5,61$$

- f. $(3x - 5)(2x - 6) = 0$
 $3x = 5 \quad \vee \quad 2x = 6$
 $x = \frac{5}{3} \quad \vee \quad x = 3$
- g. $8x^2 + 3 = 10x$
 $8x^2 - 10x + 3 = 0$
 $x = \frac{10 \pm \sqrt{100 - 94}}{16} = \frac{10 \pm \sqrt{4}}{16} = \frac{10 \pm 2}{16}$
 $x = \frac{10 + 2}{16} = 0,75 \quad \vee \quad x = \frac{10 - 2}{16} = 0,5$
- h. $(3x + 2)(x - 1) = (x + 5)x$
 $3x^2 - 3x + 2x - 2 = x^2 + 5x$
 $2x^2 - 6x - 2 = 0$
 $x^2 - 3x - 1 = 0$
 $x = \frac{3 \pm \sqrt{9 + 4}}{2} = \frac{3 \pm \sqrt{13}}{2}$
 $x = \frac{3 + \sqrt{13}}{2} = 3,30 \quad \vee \quad x = \frac{3 - \sqrt{13}}{2} = -0,30$
- i. $(x + 2)^2 = 3x + 7$
 $x^2 + 4x + 4 = 3x + 7$
 $x^2 + x - 3 = 0$
 $x = \frac{-1 \pm \sqrt{1 + 12}}{2} = \frac{-1 \pm \sqrt{13}}{2}$
 $x = \frac{-1 + \sqrt{13}}{2} = 1,30 \quad \vee \quad x = \frac{-1 - \sqrt{13}}{2} = -2,30$
- j. $9 - (x - 1)^2 = (x - 4)^2$
 $9 - (x^2 - 2x + 1) = x^2 - 8x + 16$
 $9 - x^2 + 2x - 1 = x^2 - 8x + 16$
 $-2x^2 + 10x - 8 = 0$
 $x^2 - 5x + 4 = 0$
 $(x - 1)(x - 4) = 0$
 $x = 1 \quad \vee \quad x = 4$

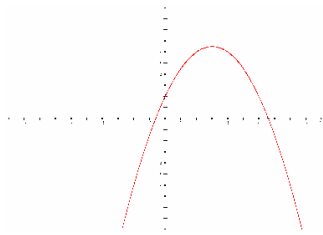
Opgave 9:

- a. $y_1 = x^2$
 $y_2 = x + 2$
intersect geeft $x = -1 \quad \vee \quad x = 2$
dus $x \leq -1 \quad \vee \quad x \geq 2$
- b. $y_1 = x(8 - x)$
 $y_2 = (x - 2)(x + 4)$
intersect geeft $x = -1 \quad \vee \quad x = 4$
dus $-1 < x < 4$



Opgave 10:

a.



b. de optie maximum geeft $x = 3 \wedge y = 6,5$
dus $\max f(3) = 6,5$

c. $A(0,2)$ $y_2 = 2$ intersect geeft $x = 6$ dus $AB = 6 - 0 = 6$ d. $CD = 2 \cdot 6 = 12$ $f(x) = f(x+12)$ $y_1 = -0,5x^2 + 3x + 2$ en $y_2 = -0,5(x+12)^2 + 3(x+12) + 2$ de optie intersect geeft $x = -3 \wedge y = -11,5$ dus $c = -11,5$ **Opgave 11:**a. als $p = 600$ dan $q = 250$ als $p = 640$ dan $q = 240$

$$rc = \frac{\Delta p}{\Delta q} = \frac{640 - 600}{240 - 250} = -4$$

 $p = -4q + b$ door $(250, 600)$

$$600 = -1000 + b$$

$$b = 1600$$

$$p = -4q + 1600$$

b. $R = p \cdot q = (-4q + 1600) \cdot q = -4q^2 + 1600q$ c. $y_1 = -4x^2 + 1600x$ de optie maximum geeft $x = 200$ dus $q = 200$ d. $K = 320q + 50000$ e. $W = R - K = -4q^2 + 1600q - (320q + 50000)$

$$= -4q^2 + 1600q - 320q - 50000$$

$$= -4q^2 + 1280q - 50000$$

f. $y_2 = -4x^2 + 1280x - 50000$ de optie maximum geeft $x = 160 \wedge y = 52400$ dus $W_{\max} = 52400$ euro en $q = 160$ dus $p = -4 \cdot 160 + 1600 = 960$ euro

Gemengde opgaven hoofdstuk 2: Functies en grafieken.

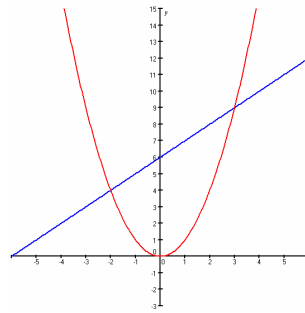
Opgave 14:

- a. $5x^2 - 6x = 0$
 $x(5x - 6) = 0$
 $x = 0 \quad \vee \quad 5x = 6$
 $x = 0 \quad \vee \quad x = 1,2$
- b. $5x^2 - 6x = 8$
 $5x^2 - 6x - 8 = 0$
 $x = \frac{6 \pm \sqrt{36 + 160}}{10} = \frac{6 \pm \sqrt{196}}{10} = \frac{6 \pm 14}{10}$
 $x = \frac{6 + 14}{10} = 2 \quad \vee \quad x = \frac{6 - 14}{10} = -0,8$
- c. $5x^2 - 6x = 4x$
 $5x^2 - 10x = 0$
 $5x(x - 2) = 0$
 $x = 0 \quad \vee \quad x = 2$
- d. $3x^2 + 5 = 9$
 $3x^2 = 4$
 $x^2 = \frac{4}{3}$
 $x = \sqrt{\frac{4}{3}} = 1,15 \quad \vee \quad x = -\sqrt{\frac{4}{3}} = -1,15$
- e. $x^2 + 3(x - 6) = 3x$
 $x^2 + 3x - 18 = 3x$
 $x^2 = 18$
 $x = \sqrt{18} = 4,24 \quad \vee \quad x = -\sqrt{18} = -4,24$
- f. $(2x - 3)(5x - 9) = 0$
 $2x = 3 \quad \vee \quad 5x = 9$
 $x = 1,5 \quad \vee \quad x = 1,8$
- g. $8x + 3 = 10(6x - 2)$
 $8x + 3 = 60x - 20$
 $-52x = -23$
 $x = 0,44$
- h. $(3x + 2)(x - 1) = 2$
 $3x^2 - 3x + 2x - 2 = 2$
 $3x^2 - x - 4 = 0$
 $x = \frac{1 \pm \sqrt{1 + 48}}{6} = \frac{1 \pm \sqrt{49}}{6} = \frac{1 \pm 7}{6}$
 $x = \frac{1 + 7}{6} = \frac{4}{3} \quad \vee \quad x = \frac{1 - 7}{6} = -1$
- i. $(x + 2)^2 = 25$
 $x + 2 = 5 \quad \vee \quad x + 2 = -5$
 $x = 3 \quad \vee \quad x = -7$

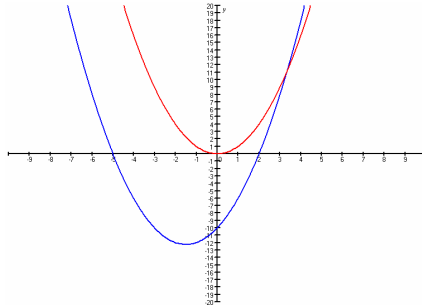
j. $8 + (2x - 1)^2 = 11x$
 $8 + 4x^2 - 4x + 1 = 11x$
 $4x^2 - 15x + 9 = 0$
 $x = \frac{15 \pm \sqrt{225 - 144}}{8} = \frac{15 \pm \sqrt{81}}{8} = \frac{15 \pm 9}{8}$
 $x = \frac{15 + 9}{8} = 3 \quad \vee \quad x = \frac{15 - 9}{8} = 0,75$

Opgave 15:

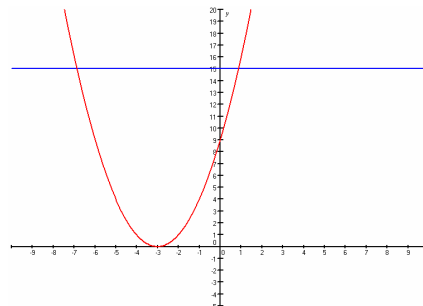
a. $y_1 = x^2$
 $y_2 = x + 6$
intersect geeft:
 $x = -2 \quad \vee \quad x = 3$
 $x \leq -2 \quad \vee \quad x \geq 3$



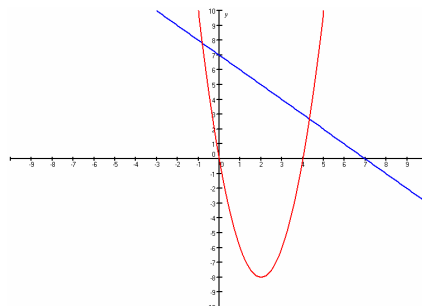
b. $y_1 = x^2$
 $y_2 = (x - 2)(x + 5)$
intersect geeft: $x = 3,33$
 $x < 3,33$



c. $y_1 = (x + 3)^2$
 $y_2 = 15$
intersect geeft: $x = -6,87 \quad \vee \quad x = 0,87$
 $-6,87 \leq x \leq 0,87$



d. $y_1 = 2x^2 - 8x$
 $y_2 = -x + 7$
intersect geeft: $x = -0,81 \quad \vee \quad x = 4,31$
 $-0,81 < x < 4,31$



Opgave 16:

a. $rc_m = rc_k = -0,5$
 $y = -0,5x + b$ door $(-4,3)$
 $3 = 2 + b$
 $b = 1$

$$m: y = -0,5x + 1$$

b. snijpunt x -as: $y = 0$

$$-0,5x + 16 = 0$$

$$-0,5x = -16$$

$$x = 32 \text{ dus } B(32,0)$$

$$rc_m = rc_l = 2$$

$$y = 2x + b \text{ door } (32,0)$$

$$0 = 64 + b$$

$$b = -64$$

$$n: y = 2x - 64$$

snijpunt y -as: $(0, -64)$

c. $-0,5x + 16 = 2x - 9$

$$-2,5x = -25$$

$$x = 10$$

$$y = -0,5 \cdot 10 + 16 = 11 \text{ dus } C(10,11)$$

d. $2x - 9 = -24$

$$2x = -15$$

$$x = -7,5$$

Opgave 17:

a. als $g = 2355$ dan $B = 735,94$

als $g = 2906$ dan $B = 890,22$

$$rc = \frac{\Delta B}{\Delta g} = \frac{890,22 - 735,94}{2906 - 2355} = 0,28$$

$$B = 0,28g + b \text{ door } (2355; 735,94)$$

$$735,94 = 659,4 + b$$

$$b = 76,54$$

$$B = 0,28g + 76,54$$

b. vastrecht € 76,54

prijs per m^3 gas € 0,28

c. $B = 0,28 \cdot 2318 + 76,54 = 725,58$ euro

Opgave 18:

a. als $p = 4$ dan $q = 100$

als $p = 3,94$ dan $q = 105$

$$rc = \frac{\Delta p}{\Delta q} = \frac{3,94 - 4}{105 - 100} = -0,012$$

$$p = -0,012q + b \text{ door } (100,4)$$

$$4 = -1,2 + b$$

$$b = 5,2$$

$$p = -0,012q + 5,2$$

b. $K = 2,5q$

$$R = p \cdot q = (-0,012q + 5,2) \cdot q = -0,012q^2 + 5,2q$$

$$W = R - K = -0,012q^2 + 5,2q - 2,5q = -0,012q^2 + 2,7q$$

- c. de optie maximum geeft: $x = 112,5$
 dus $q = 112 \vee q = 113$
 dan $p = 3,85$ en $W_{\max} = 151,87$

Opgave 19:

- a. de optie maximum geeft $x = 3$ en $y = 2$ dus $\max f(3) = 2$

- b. $C(0; -2,5)$

$$T(3,2)$$

$$rc = \frac{\Delta y}{\Delta x} = \frac{2 - (-2,5)}{3 - 0} = 1,5$$

$$y = 1,5x + b \text{ door } (0; -2,5)$$

$$-2,5 = b$$

$$y = 1,5x - 2,5$$

- c. de optie zero geeft $x = 5$ dus $B(5,0)$

$$rc = \frac{\Delta y}{\Delta x} = \frac{0 - (-2,5)}{5 - 0} = 0,5$$

$$y = 0,5x + b \text{ door } (3,2)$$

$$2 = 1,5 + b$$

$$b = 0,5$$

$$y = 0,5x + 0,5$$

$$\text{snijpunt } x\text{-as: } y = 0$$

$$0,5x + 0,5 = 0$$

$$0,5x = -0,5$$

$$x = -1 \text{ dus } D(-1,0)$$

Opgave 20:

- a. de optie maximum geeft $x = -3$ en $y = 5$ dus $\max g(-3) = 5$

- b. $-0,5x + 3 = -x^2 - 6x - 4$

$$x^2 + 5,5x + 7 = 0$$

$$x = \frac{-5,5 \pm \sqrt{30,25 - 28}}{2} = \frac{-5,5 \pm \sqrt{2,25}}{2} = \frac{-5,5 \pm 1,5}{2}$$

$$x = \frac{-5,5 - 1,5}{2} = -3,5 \quad \vee \quad x = \frac{-5,5 + 1,5}{2} = -2$$

$$y = -0,5 \cdot -3,5 + 3 = 4,75 \quad y = -0,5 \cdot -2 + 3 = 4$$

$$\text{dus } (-3,5; 4,75) \text{ en } (-2,4)$$

- c. $f(2) = 2$ en $g(2) = -20$

$$\text{dus } AB = 2 - (-20) = 22$$

Opgave 21:

- a. als $p = 1,80$ dan $q = 1000$

$$\text{als } p = 1,70 \text{ dan } q = 1100$$

$$rc = \frac{\Delta p}{\Delta q} = \frac{1,70 - 1,80}{1100 - 1000} = -0,001$$

$$p = -0,001q + b \text{ door } (1000; 1,8)$$

$$1,8 = -1 + b$$

$$b = 2,8$$

$$p = -0,001q + 2,8$$

$$R = p \cdot q = (-0,001q + 2,8) \cdot q = -0,001q^2 + 2,8q$$

$$W = R - K = -0,001q^2 + 2,8q - 1,2q = -0,001q^2 + 1,6q$$

b. $y_1 = -0,001x^2 + 2,8x$ de optie maximum geeft $x = 1400$

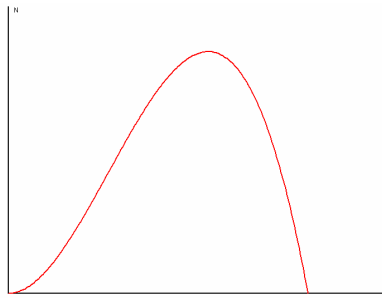
dus $q = 1400$ en dan $p = -0,001 \cdot 1400 + 2,8 = 1,4$

c. $y_1 = -0,001x^2 + 1,6x$ de optie maximum geeft $x = 800$

dus $q = 800$ en dan is $p = -0,001 \cdot 800 + 2,8 = 2$ en $W_{\max} = 640$

Opgave 22:

a.



b. $y_1 = 4x^2 - 0,25x^3$
de optie maximum geeft $x = 10,67$ en $y = 152$

dus $t = 10,67$ weken = 75 dagen

$$N_{\max} = 152$$

c. de optie zero geeft $x = 16$ dus na 16 weken

d. $y_2 = 100$

intersect geeft $x = 6,48 \vee x = 13,94$

$13,94 - 6,48 = 7,46$ weken = 52 dagen