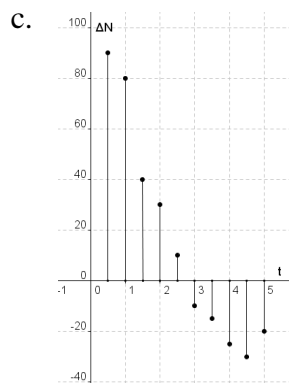
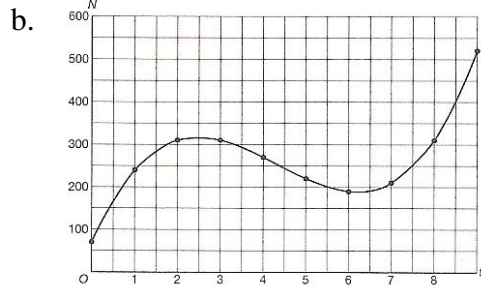


Gemengde opgave hoofdstuk 7: Veranderingen.

Opgave 23:

a. 1998: $220 + 50 + 40 - 0 - 70 - 170 = 70$

2007: $220 - 30 + 20 + 100 + 210 = 520$



d. $N(5) = 195 \neq 70$

Opgave 24:

$$y_1 = \frac{5x+6}{\sqrt{2x+9}}$$

a. $y_A = f(-4) = -14$

$$rc_l = \left[\frac{dy}{dx} \right]_{x=-4} = 19$$

$$y = 19x + b \text{ door } (-4, -14)$$

$$-14 = -76 + b$$

$$62 = b$$

$$l: y = 19x + 62$$

b. $y_B = f(0) = 2$

$$rc_k = \left[\frac{dy}{dx} \right]_{x=0} = 1,44$$

$$y = 1,44x + b \text{ door } (0, 2)$$

$$2 = b$$

$$k: y = 1,44x + 2$$

c. $y_C = f(8) = 9,2$

$$rc_m = \left[\frac{dy}{dx} \right]_{x=8} = 0,632$$

$$y = 0,632x + b \text{ door } (8; 9,2)$$

$$9,2 = 5,056 + b$$

$$4,144 = b$$

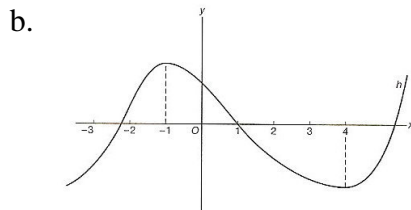
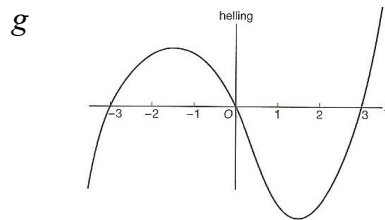
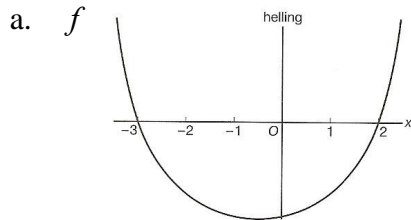
$$m : y = 0,632x + 4,144$$

$$0,632x + 4,144 = 0$$

$$0,632x = -4,144$$

$$x = -6,56$$

Opgave 25:



Opgave 26:

a. $f(x) = -x(2x - 7) = -2x^2 + 7x$
 $f'(x) = -4x + 7$

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

c. $h(x) = x(3x + 2)^2 = x(9x^2 + 12x + 4) = 9x^3 + 12x^2 + 4x$
 $h'(x) = 27x^2 + 24x + 4$

d. $m(t) = 7 - \frac{t^2 + 8t}{16} = 7 - \frac{1}{16}t^2 - \frac{1}{2}t$
 $m'(t) = -\frac{1}{8}t - \frac{1}{2}$

e. $k(a) = 8 - (a - 1)^2 = 8 - (a^2 - 2a + 1) = 8 - a^2 + 2a - 1$
 $k'(a) = -2a + 2$

f. $p(x) = 5x - x(2x + 5)(x - 3)$
 $= 5x - x(2x^2 - x - 15)$
 $= 5x - 2x^3 + x^2 + 15x$
 $= -2x^3 + x^2 + 20x$
 $p'(x) = -6x^2 + 2x + 20$

Opgave 27:

a. $(x^2 - 9)(x - 1) = 0$
 $x^2 = 9 \quad \vee \quad x = 1$
 $x = 3 \quad \vee \quad x = -3 \quad \vee \quad x = 1$

$$x_P = -3 \quad x_Q = 1 \quad x_R = 3$$

$$f(x) = (x^2 - 9)(x - 1) = x^3 - x^2 - 9x + 9$$

$$f'(x) = 3x^2 - 2x - 9$$

$$f'(-3) = 24$$

$$f'(3) = 12$$

dus niet gelijk

b. $y_A = f(2) = -5$

$$rc_k = f'(2) = -1$$

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

$$-5 = -2 + b$$

$$-3 = b$$

$$k: y = -x - 3$$

c. $y_B = f(0) = 9$

$$rc_m = f'(0) = -9$$

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

$$9 = b$$

$$m: y = -9x + 9$$

d. $rc = f'(-1) = -4$ dus niet horizontaal

Opgave 28:

$$g(x) = (2x - 1)(5x + 3) = 10x^2 + x - 3$$

$$\frac{d}{dx}(g(x)) = 20x + 1$$

$$H(t) = 6(t + 3)^2 - 2(t - 1)$$

$$= 6(t^2 + 6t + 9) - 2t + 2$$

$$= 6t^2 + 36t + 54 - 2t + 2$$

$$= 6t^2 + 34t + 56$$

$$\frac{dH}{dt} = 12t + 34$$

$$\frac{dL}{db} = 6b$$

$$\frac{dL}{da} = 4 - 4a$$

$$\frac{dy}{dx} = -0,09x^2 + 8,12x - 1$$

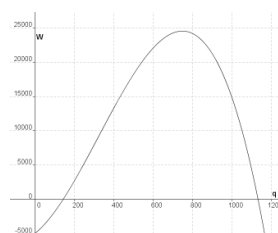
$$\left[\frac{dy}{dx} \right]_{x=4} = 30,04$$

Opgave 29:

a. $W'(q) = -0,0003q^2 + 0,195q + 22,5$

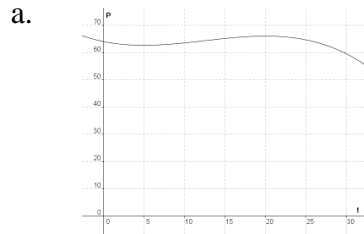
$$W'(750) = 0$$

$$W_{\max} = 24531,25 \text{ euro}$$



- b. $W'(300) = 54$
 $W'(400) = 52,5$
 $W'(300) > W'(400)$

Opgave 30:



- b. $P' = -0,006t^2 + 0,15t - 0,6 = 0$
 $t^2 - 25t + 100 = 0$
 $(t - 5)(t - 20) = 0$
 $t = 5 \quad \vee \quad t = 20$
 $(5; 62,625) \quad (20; 66)$
beginpunt $(0, 64)$
eindpunt $(30; 59,5)$
- c. $66 - 62,625 = 3,375$ euro

Opgave 31:

- a. $A(2) = 30100$
opbrengst = $2 \cdot 30100 = 60200$ euro
- b. opbrengst = $1200T^2 - 18300T + 46800 = 0$

$$T = \frac{18300 \pm \sqrt{110250000}}{2400} = \frac{18300 \pm 10500}{2400}$$
 $T = 3,25 \quad \vee \quad T = 12$ (vervalt)
dus € 3,25
- c. $A(2,4) = 27144$
 $1,05 \cdot 2,4 = 2,52$
 $A(2,52) = 26282$
 $\frac{26282 - 27144}{27144} \cdot 100\% = -3,2\%$ dus een afname van 3,2%