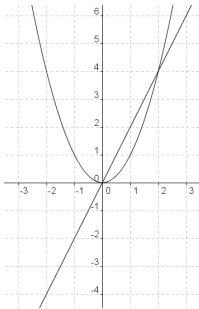


7.4 De afgeleide functie

Opgave 54:

a.

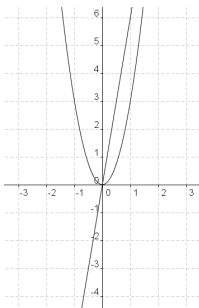


b. $a = 2$

c. $\left[\frac{dy}{dx}\right]_{x=36} = 2 \cdot 36 = 72$

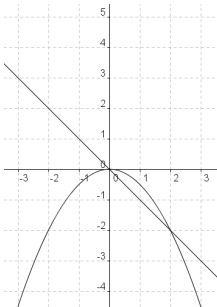
Opgave 55:

a.



b. $y = 6x$

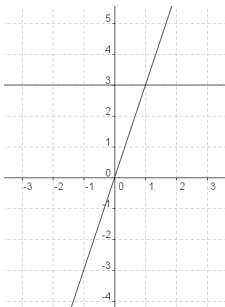
c.



d. $y = -x$

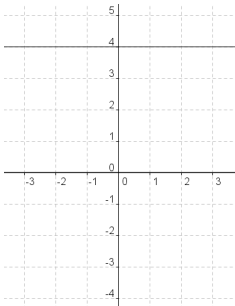
Opgave 56:

a.



b. voor elke waarde van x is de helling gelijk

c. $y = 3$

d.  de x -as is de hellingfunctie van g

e. $y = 0$

Opgave 57:

a. $f'(x) = -16x$

b. $g'(x) = -16x + 7$

c. $h'(x) = -2x + 8$

d. $k'(x) = -0,5x + 1$

Opgave 58:

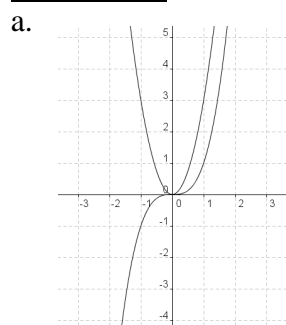
a. $f(x) = (5x + 7)(4 - 3x) = 20x - 15x^2 + 28 - 21x = -15x^2 - x + 28$
 $f'(x) = -30x - 1$

b. $g(x) = (3x + 6)^2 - 8x = 9x^2 + 36x + 36 - 8x = 9x^2 + 28x + 36$
 $g'(x) = 18x + 28$

c. $h(x) = 5(x - 3)^2 + 5(2x - 1) = 5(x^2 - 6x + 9) + 10x - 5$
 $= 5x^2 - 30x + 45 + 10x - 5 = 5x^2 - 20x + 40$
 $h'(x) = 10x - 20$

d. $k(x) = -3(x - 1)(5 - 9x) - 8(x - 7) = -3(5x - 9x^2 - 5 + 9x) - 8x + 56$
 $= -15x + 27x^2 + 15 - 27x - 8x + 56 = 27x^2 - 50x + 71$
 $k'(x) = 54x - 50$

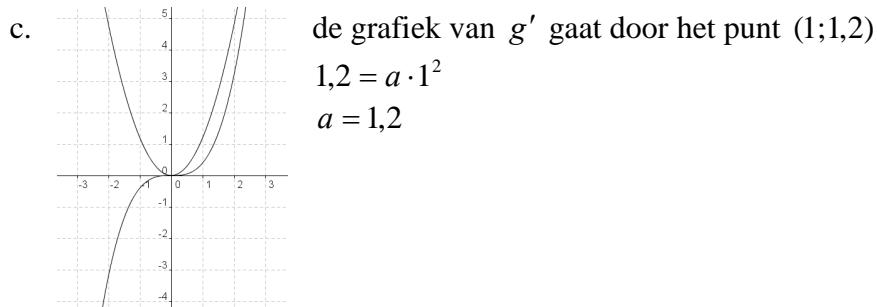
Opgave 59:



b. de grafiek van f' gaat door het punt $(1, 3)$

dus $3 = a \cdot 1^2$

$a = 3$



Opgave 60:

- $f'(x) = 30x^5 - 15x^4 + 2$
- $g'(x) = -16x^7 - 16x^3$
- $h'(x) = -x^2 - x - 1$
- $k'(q) = 3 - 6q - 35q^6$

Opgave 61:

- $f(x) = (3x - 1)(x^2 + 5x) = 3x^3 + 15x^2 - x^2 - 5x = 3x^3 + 14x^2 - 5x$
 $f'(x) = 9x^2 + 28x - 5$
- $g(x) = (3x^3 - 1)^2 = 9x^6 - 6x^3 + 1$
 $g'(x) = 54x^5 - 18x^2$
- $h(x) = (5x^5 - 3)(3x - 2) = 15x^6 - 10x^5 - 9x + 6$
 $h'(x) = 90x^5 - 50x^4 - 9$
- $k(x) = 5 - 3(x^4 - x)(x + 1) = 5 - 3(x^5 + x^4 - x^2 - x) = 5 - 3x^5 - 3x^4 + 3x^2 + 3x$
 $k'(x) = -15x^4 - 12x^3 + 6x + 3$
- $l(t) = (5t^3 - t)(3t^5 + t) = 15t^8 - 3t^6 + 5t^4 - t^2$
 $l'(t) = 120t^7 - 18t^5 + 20t^3 - 2t$
- $m(q) = 1 - (3q^2 - 2)^2 = 1 - (9q^4 - 12q^2 + 4) = 1 - 9q^4 + 12q^2 - 4$
 $m'(q) = -36q^3 + 24q$

Opgave 62:

- $f'(x) = 2x - 3$
 $f'(4) = 5$
 $f(4) = 3$
- $y_A = f(4)$
- $f'(4)$

Opgave 63:

- $y_A = f(4) = 2$
 $f'(x) = 1,5x^2 - 4x$
 $rc_k = f'(4) = 8$
 $y = 8x + b$ door $(4,2)$
 $2 = 32 + b$
 $-30 = b$

$$k: y = 8x - 30$$

- b. $y_B = f(-2) = -10$
 $rc_m = f'(-2) = 14$
 $y = 14x + b$ door $(-2, -10)$
 $-10 = -28 + b$
 $18 = b$
 $m: y = 14x + 18$

Opgave 64:

- a. $y_A = g(-3) = 36$
 $g'(x) = 4x - 6$
 $rc_l = g'(-3) = -18$
 $y = -18x + b$ door $(-3, 36)$
 $36 = 54 + b$
 $-18 = b$
 $l: y = -18x - 18$
- b. $2x^2 - 6x = 0$
 $2x(x - 3) = 0$
 $x = 0 \vee x = 3$
 $rc_n = g'(3) = 6$
 $y = 6x + b$ door $(3, 0)$
 $0 = 18 + b$
 $-18 = b$
 $n: y = 6x - 18$

Opgave 65:

- a. $f(x) = (x^2 - 4)(x + 1) = x^3 + x^2 - 4x - 4$
 $f'(x) = 3x^2 + 2x - 4$
- b. $y_A = f(-3) = -10$
 $rc_k = f'(-3) = 17$
 $y = 17x + b$ door $(-3, -10)$
 $-10 = -51 + b$
 $41 = b$
 $k: y = 17x + 41$
- c. $y_B = f(0) = -4$
 $rc_l = f'(0) = -4$
 $y = -4x + b$ door $(0, -4)$
 $-4 = 0 + b$
 $-4 = b$
 $l: y = -4x - 4$
- d. $(x^2 - 4)(x + 1) = 0$
 $x^2 = 4 \vee x = -1$
 $x = -2 \vee x = 2 \vee x = -1$
 $x_C = 2$

$$\begin{aligned}rc_m &= f'(2) = 12 \\y &= 12x + b \text{ door } (2,0) \\0 &= 24 + b \\-24 &= b \\m : y &= 12x - 24\end{aligned}$$

Opgave 66:

- a. $f(x) = a \cdot x = a \cdot x^1$
 $f'(x) = 1 \cdot a \cdot x^0 = 1 \cdot a \cdot 1 = a$
 $g(x) = c = c \cdot x^0$
 $g'(x) = 0 \cdot c \cdot x^{-1} = 0$
- b. hij differentieert f' nog een keer
- c. $f(x) = x^4 - 3x$
 $f'(x) = 4x^3 - 3$