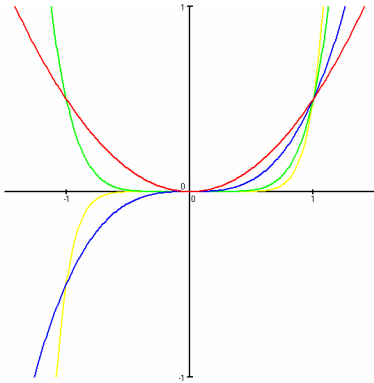


Hoofdstuk 10: Allerlei functies

10.1 Machtsfuncties

Opgave 1:

a.



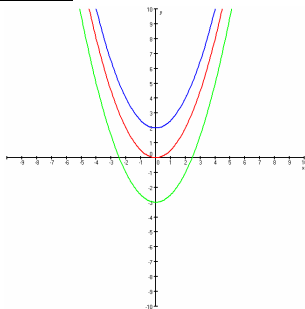
b. $(0,0)$ en $(1, \frac{1}{2})$

c. y_1 en y_3

d. y_1 en y_3

Opgave 2:

a.



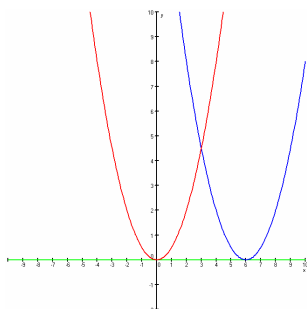
b. translatie over $(0,2)$

c. translatie over $(0,-3)$

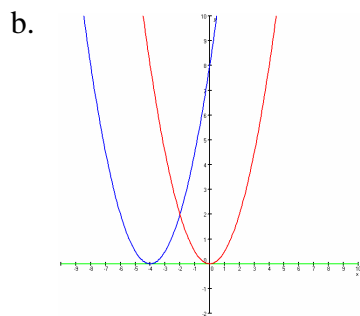
d. als je de grafiek van $y = 0,5x^2$ transleert over $(0,6)$ krijgt je de grafiek van $y = 0,5x^2 + 6$.

Opgave 3:

a.



transleer over $(6,0)$



transleer over $(-4,0)$

- c. als je de grafiek van $y = 0,5x^2$ transleert over $(2,0)$ krijg je de grafiek van $y = 0,5(x - 2)^2$.

Opgave 4:

- a. $y = -5x^2 \xrightarrow{T(2,5)} y = -5(x - 2)^2 + 5$
 $y = -5x^2 \xrightarrow{T(-3,6)} y = -5(x + 3)^2 + 6$
 $y = -5x^2 \xrightarrow{T(7,0)} y = -5(x - 7)^2$
- b. $y = 4x^5 \xrightarrow{T(-5,7)} y = 4(x + 5)^5 + 7$
 $y = 4x^5 \xrightarrow{T(0,-10)} y = 4x^5 - 10$
 $y = 4x^5 \xrightarrow{T(320,50)} y = 4(x - 320)^5 + 50$

Opgave 5:

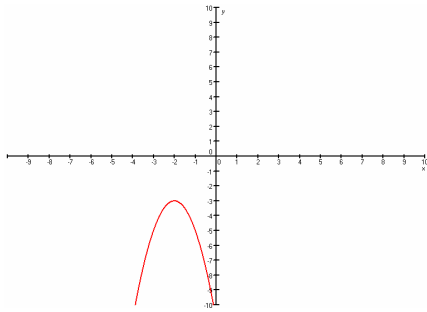
- a. $y = 5x^2 + 1 \xrightarrow{T(4,6)} y = 5(x - 4)^2 + 7$
b. $y = (x - 6)^3 \xrightarrow{T(4,6)} y = (x - 10)^3 + 6$
c. $y = -x^4 + 2 \xrightarrow{T(4,6)} y = -(x - 4)^4 + 8$
d. $y = 3(x - 5)^6 + 8 \xrightarrow{T(4,6)} y = 3(x - 9)^6 + 14$
e. $y = -2(x + 4)^5 + 6 \xrightarrow{T(4,6)} y = -2x^5 + 12$
f. $y = -2(x - 4)^2 - 6 \xrightarrow{T(4,6)} y = -2(x - 8)^2$

Opgave 6:

- a. $y = 5x^6 \xrightarrow{T(8,-3)} y = 5(x - 8)^6 - 3$
b. $y = -3x^4 + 6 \xrightarrow{T(-4,0)} y = -3(x + 4)^4 + 6$
c. $y = 2(x - 3)^2 \xrightarrow{T(5,0)} y = 2(x - 8)^2$
d. $y = -5(x - 1)^3 + 8 \xrightarrow{T(2,-7)} y = -5(x - 3)^3 + 1$
e. $y = x^5 + 6 \xrightarrow{T(-8,-3)} y = (x + 8)^5 + 3$
f. $y = -x^4 \xrightarrow{T(7,-8)} y = -(x - 7)^4 - 8$

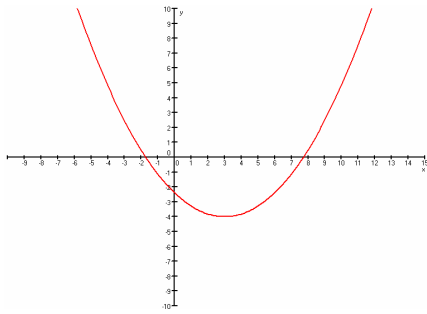
Opgave 7:

a.



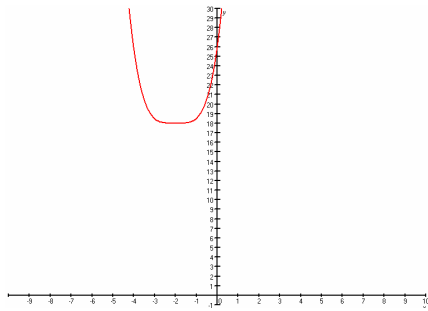
$$\max f(-2) = -3$$

b.



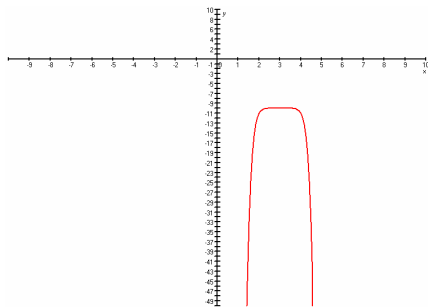
$$\min g(3) = -4$$

c.



$$\min h(-2) = 18$$

d.



$$\max k(3) = -10$$

Opgave 8:

a. $\max f(5) = 8$

b. $\min g(0) = 7$

c. $\min h(-2) = 0$

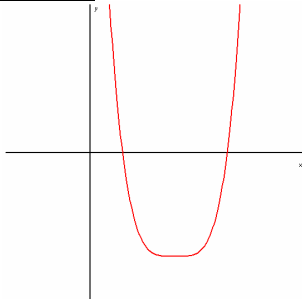
d. $\min k(8) = 12$

e. $\max l(100) = 0$

f. $\max m(-0,15) = -0,3$

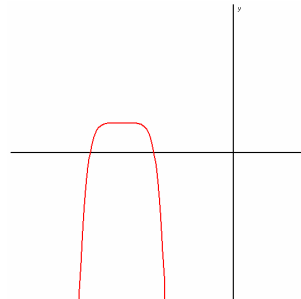
Opgave 9:

a.



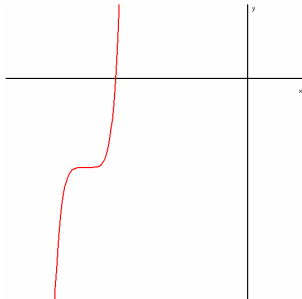
top (2,-7)

b.



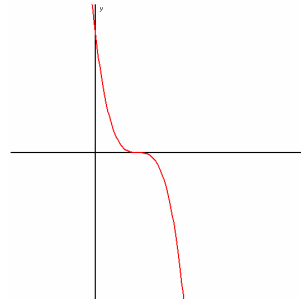
top (-3,2)

c.



punt van symmetrie (-6,-12)

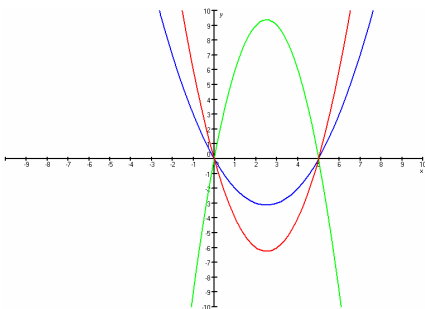
d.



punt van symmetrie (1,0)

Opgave 10:

a.



- b. vermenigvuldiging ten opzichte van de x -as met factor 0,5.
vermenigvuldiging ten opzichte van de x -as met factor $-1,5$.

Opgave 11:

a. $y = 0,3x^2 \xrightarrow{T(-5,6)} y = 0,3(x+5)^2 + 6 \xrightarrow{V_{x-as,-3}} y = -0,9(x+5)^2 - 18$
top (-5,-18)

b. $y = 0,5x^4 \xrightarrow{V_{x-as,-4}} y = -2x^4 \xrightarrow{T(-3,5)} y = -2(x+3)^4 + 5$
top (-3,5)

c. $y = -3x^5 + 4 \xrightarrow{T(2,-7)} y = -3(x-2)^5 - 3 \xrightarrow{V_{x-as,6}} y = -18(x-2)^5 - 18$
punt van symmetrie (2,-18)

Opgave 12:

a. $y = -0,12x^2 \xrightarrow{T(4,5)} y = -0,12(x-4)^2 + 5 \xrightarrow{V_{x-as,4}} y = -0,48(x-4)^2 + 20$
top (4,20)

b. $y = 5x^4 \xrightarrow{V_{x-as,-2}} y = -10x^4 \xrightarrow{T(6,0)} y = -10(x-6)^4$
top (6,0)

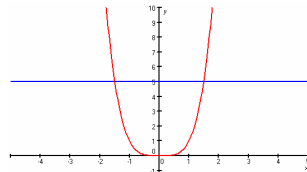
- c. $y = 3(x-4)^2 - 8 \xrightarrow{T(-5,2)} y = 3(x+1)^2 - 6 \xrightarrow{V_{x-as,-4}} y = -12(x+1)^2 + 24$
top (-1,24)
- d. $y = -1,5(x+3)^3 + 8 \xrightarrow{V_{x-as,-2}} y = 3(x+3)^3 - 16 \xrightarrow{T(8,20)} y = 3(x-5)^3 + 4$
punt van symmetrie (5,4)

Opgave 13:

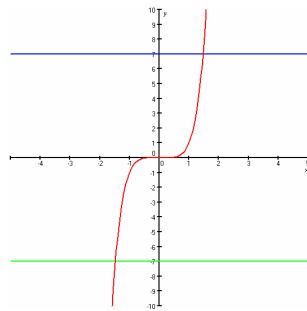
- a. $V_{x-as,-1}$
- b. $y = 3(x-1)^2 - 6 \xrightarrow{S_{x-as}} y = -3(x-1)^2 + 6$

Opgave 14:

- a. twee oplossingen
geen oplossing



- b. één oplossing
één oplossing



Opgave 15:

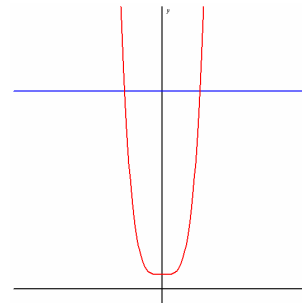
- a. $3x^6 - 1 = 5$
 $3x^6 = 6$
 $x^6 = 2$
 $x = \sqrt[6]{2} \quad \vee \quad x = -\sqrt[6]{2}$
- b. $\frac{1}{3}x^4 + 7 = 11$
 $\frac{1}{3}x^4 = 4$
 $x^4 = 12$
 $x = \sqrt[4]{12} \quad \vee \quad x = -\sqrt[4]{12}$
- c. $-2x^5 + 8 = 15$
 $-2x^5 = 7$
 $x^5 = -3\frac{1}{2}$
 $x = \sqrt[5]{-3\frac{1}{2}}$
- d. $3x^4 - 7 = 11$
 $3x^4 = 18$
 $x^4 = 6$
 $x = \sqrt[4]{6} \quad \vee \quad x = -\sqrt[4]{6}$

e. $5(2x-1)^6 + 7 = 12$
 $5(2x-1)^6 = 5$
 $(2x-1)^6 = 1$
 $2x-1 = 1 \quad \vee \quad 2x-1 = -1$
 $2x = 2 \quad \vee \quad 2x = 0$
 $x = 1 \quad \vee \quad x = 0$

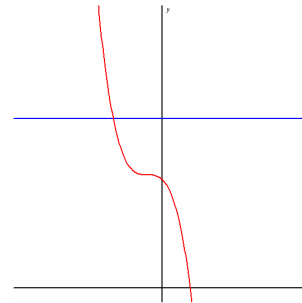
f. $-\frac{1}{4}(3x-1)^3 + 8 = 10$
 $-\frac{1}{4}(3x-1)^3 = 2$
 $(3x-1)^3 = -8$
 $3x-1 = -2$
 $3x = -1$
 $x = -\frac{1}{3}$

Opgave 16:

a. $y_1 = 5x^4 + 1$ en $y_2 = 14$
intersect geeft $x = -1,27 \quad \vee \quad x = 1,27$
 $x < -1,27 \quad \vee \quad x > 1,27$



b. $y_1 = -\frac{1}{3}(2x+1)^3 + 8$ en $y_2 = 12$
intersect geeft $x = -1,64$
 $x \leq -1,64$



Opgave 17:

a. $\frac{1}{5}x^3 - 7 = 1$
 $\frac{1}{5}x^3 = 8$
 $x^3 = 40$
 $x = \sqrt[3]{40} = 3,42$

b. $-3x^6 + 2 = 20$
 $-3x^6 = 18$
 $x^6 = -6$
geen oplossingen

c. $3(\frac{1}{2}x+1)^4 + 5 = 41$
 $3(\frac{1}{2}x+1)^4 = 36$
 $(\frac{1}{2}x+1)^4 = 12$
 $\frac{1}{2}x+1 = \sqrt[4]{12} = 1,86 \quad \vee \quad \frac{1}{2}x+1 = -\sqrt[4]{12} = -1,86$

$$\frac{1}{2}x = 0,86 \quad \vee \quad \frac{1}{2}x = -2,86$$

$$x = 1,72 \quad \vee \quad x = -5,72$$

d. $-(x+1)^5 - 1 = 8$

$$-(x+1)^5 = 9$$

$$(x+1)^5 = -9$$

$$x+1 = \sqrt[5]{-9} = -1,55$$

$$x = -2,55$$