

(1) Skets die volgende funksies op verskillende asselstelsels:

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

$$y = \frac{2x^2}{2} - \frac{6x}{2} + \frac{4}{2}$$

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

Vorm: $a > 0$ 

y-afs: $(x=0) \rightarrow (0; 2)$

x-afs: $(y=0) \rightarrow x^2 - 3x + 2 = 0$

$$(x-2)(x-1) = 0$$

$$x = 2 \text{ of } x = 1$$

$$(2; 0)$$

$$(1; 0)$$

Simm-qs: $x = \frac{-b}{2a}$

$$= \frac{-(-3)}{2(1)} = \frac{3}{2}$$

of $x = \frac{x_1 + x_2}{2}$

$$= \frac{2+1}{2} = \frac{3}{2}$$

DP: $y = \left(\frac{3}{2}\right)^2 - 3\left(\frac{3}{2}\right) + 2$

$$y = -\frac{1}{4}$$

$$\therefore DP\left(\frac{3}{2}; -\frac{1}{4}\right)$$

(b) $y = x^2 + 4x + 1$

Vorm: $a > 0$ $\uparrow\uparrow$

y-afs: $(x=c) \rightarrow (c; 1)$

x-afs: $(y=0) \rightarrow 0 = x^2 + 4x + 1$

$a=1$ $b=4$ $c=1$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{-(4) \pm \sqrt{(4)^2 - 4(1)(1)}}{2(1)}$$

$$x = \frac{-4 \pm \sqrt{12}}{2}$$

$\therefore x \approx -0,27$ o^f $x \approx -3,73$

$(-0,27; 0)$ $(-3,73; 0)$

Simm-as: $x = -\frac{b}{2a}$

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

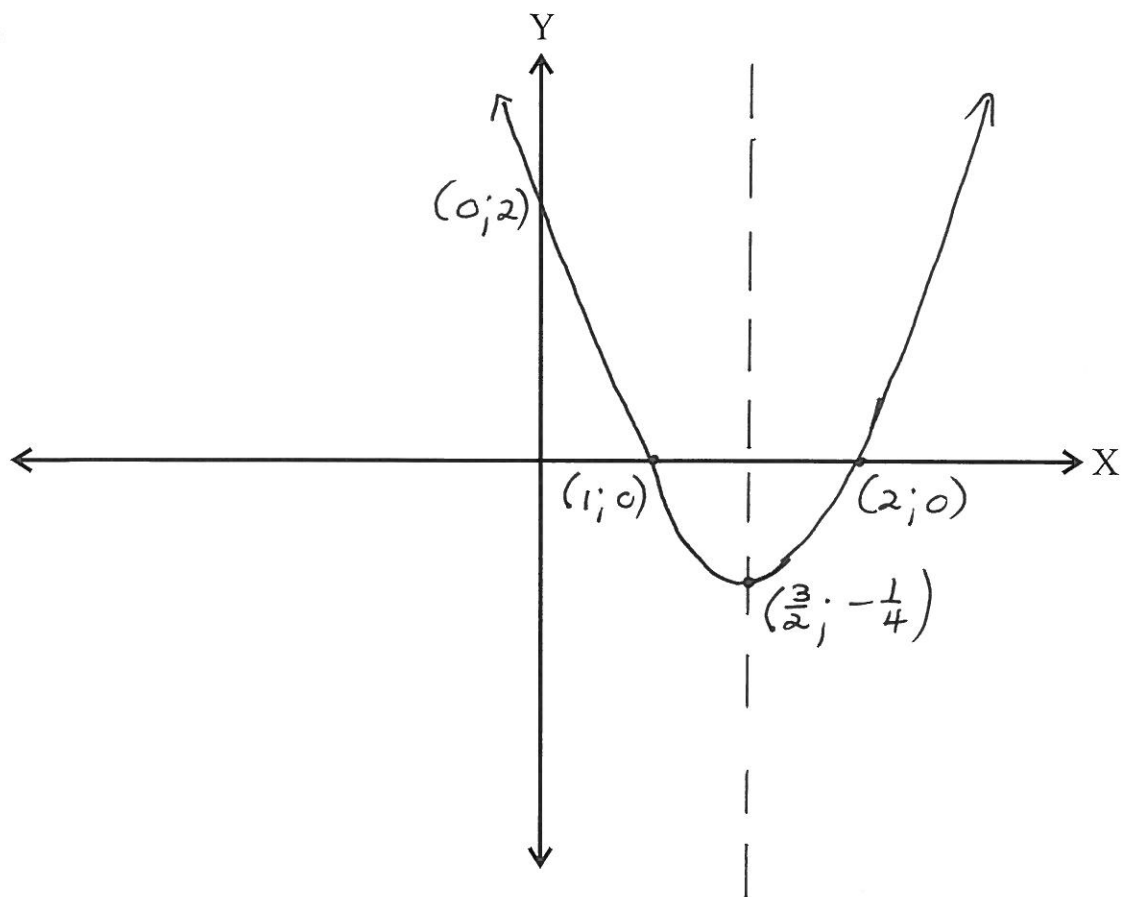
$$x = -2$$

DP: $y = (-2)^2 + 4(-2) + 1$

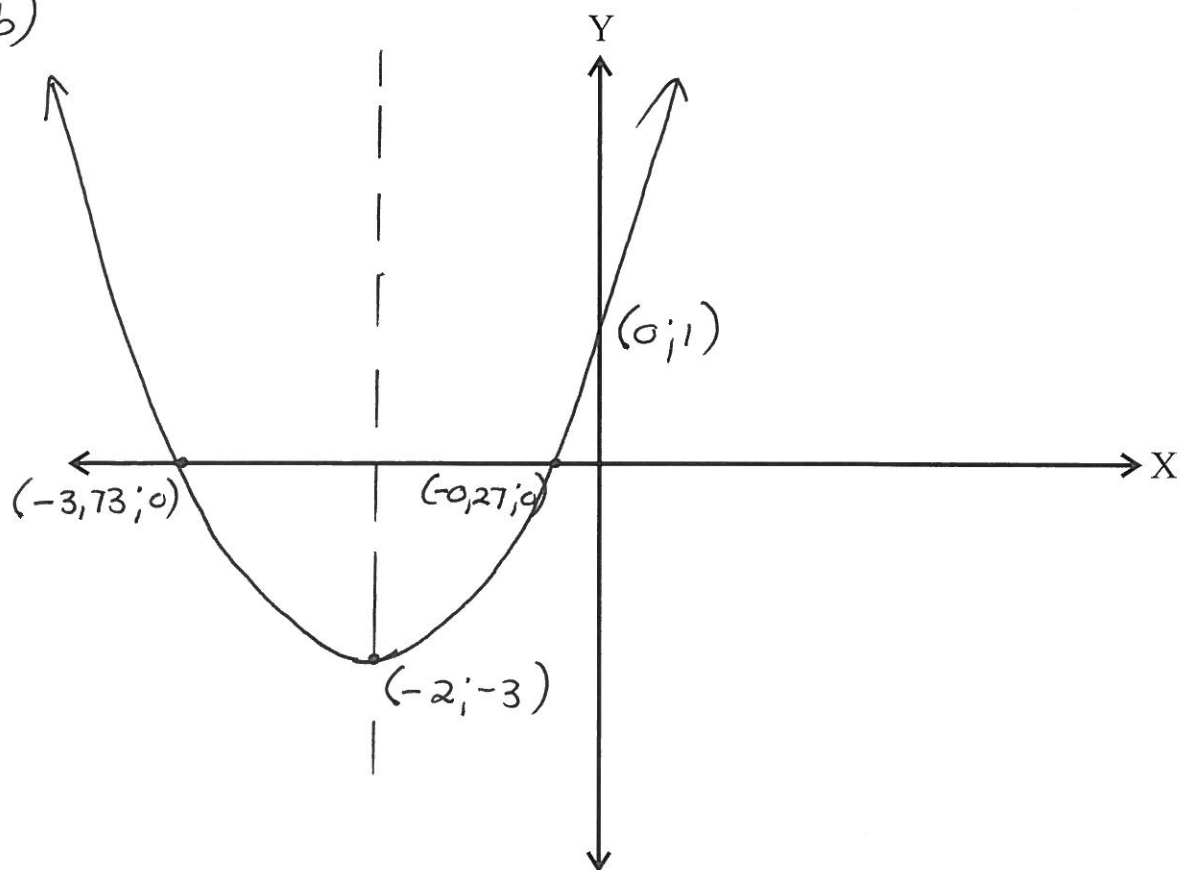
$$y = -3$$

$\therefore DP(-2; -3)$

(1)(a)



(1)(b)



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

Vorm: $a < 0$ ↩

y-afs: $(x=0) \rightarrow (0; -3)$

x-afs: $(y=0) \rightarrow 0 = -x^2 - 2x - 3$

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

$$a=1 \quad b=2 \quad c=3$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$
$$= \frac{-(2) \pm \sqrt{(2)^2 - 4(1)(3)}}{2(1)}$$

$$x = \frac{-2 \pm \sqrt{-8}}{2}$$

Geen IR-oplossing

$\therefore$ geen x-afsnitte.

Simm-qs: $x = \frac{-b}{2a}$

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

$$x = -1$$

DP: $y = -(-1)^2 - 2(-1) - 3$

$$y = -2$$

$$\therefore DP(-1; -2)$$

Kontrole punt: Gebruik symmetrie

$$\rightarrow (-2; -3)$$

(2) (a) Skets die volgende op dieselfde assstelsel:

$$p(x) = x^2 - 2x \quad \text{en} \quad q(x) = 4 - x^2$$

(b) Bepaal die volgende aan die hand van die grafieke in (a):

- (i) Definisieversameling van p.
- (ii) Waardeversameling van q.
- (iii) Min/Maks waarde van q.
- (iv) x as $p(x) = q(x)$.

$$(a) \quad p(x) = x^2 - 2x$$

$$\therefore y = x^2 - 2x$$

$$\text{Vorm: } a > 0 \quad \curvearrowright$$

$$\text{y-afs: } (x=0)$$

$$\therefore (0; 0)$$

$$\text{x-afs: } (y=0)$$

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

$$0 = x(x-2)$$

$$x=0 \quad \text{of} \quad x=2$$

$$(0; 0) \quad (2; 0)$$

$$\text{Simm-qs: } x = \frac{0+2}{2}$$

$$x = 1$$

$$\text{DP: } y = (1)^2 - 2(1)$$

$$y = -1$$

$$\therefore (1; -1)$$

$$q(x) = 4 - x^2$$

$$\therefore y = -x^2 + 4$$

$$\text{Vorm: } a < 0 \quad \curvearrowleft$$

$$\text{y-afs: } (x=0)$$

$$\therefore (0; 4)$$

$$\text{x-afs: } (y=0)$$

$$0 = 4 - x^2$$

$$0 = (2-x)(2+x)$$

$$x=2 \quad \text{of} \quad x=-2$$

$$(2; 0) \quad (-2; 0)$$

$$\text{Simm-qs: } x = \frac{2-2}{2}$$

$$x = 0$$

$$\text{DP: } y = 4 - (0)^2$$

$$y = 4$$

$$\therefore (0; 4)$$

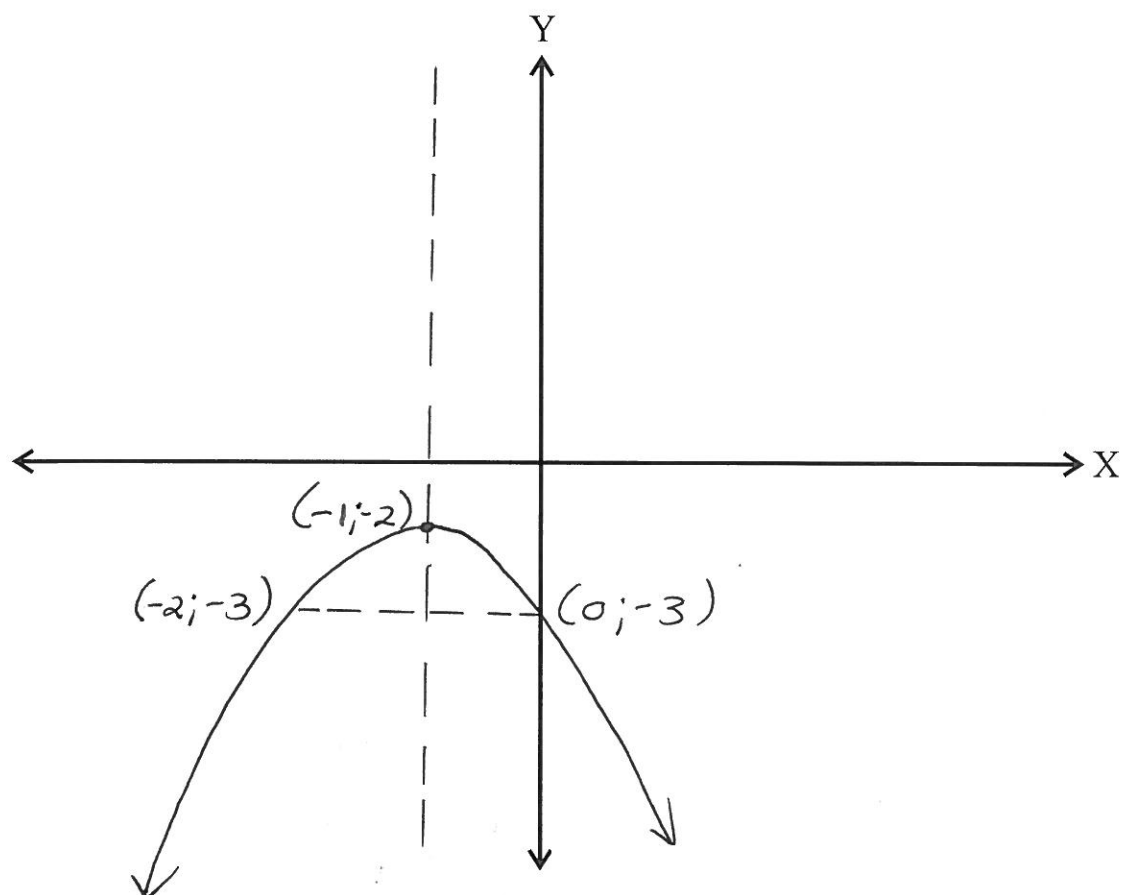
$$(b)(i) \quad D_p: x \in \mathbb{R}$$

$$(ii) \quad W_q: y \leq 4$$

$$(iii) \quad \text{maks. waarde van } 4$$

$$(iv) \quad A(2; 0) \quad \text{en} \quad B(-2; 0)$$

(1)(c)



(2)(a)

