

(1) Gegee: $p(x) = \frac{2}{x-3} + 1$

- (a) Bepaal die vergelykings van die asimptote van p .
- (b) Bereken $p(0)$.
- (c) Bereken x waar $p(x) = 0$.
- (d) Skets die grafiek van p duidelik en toon alle kritiese punte duidelik aan.
- (e) Bepaal die vergelyking van q indien q die grafiek van p is wat 2 eenhede op skuif.

(a) Horisontale asimptoot: $y = 1$

Vertikale asimptoot: $x - 3 = 0 \rightarrow x = 3$

(b) $p(x) = \frac{2}{x-3} + 1$

$$\therefore p(0) = \frac{2}{0-3} + 1$$

$$\therefore p(0) = -\frac{2}{3} + 1$$

$$\therefore p(0) = \frac{1}{3} \rightarrow y\text{-afsnit} \left(0; \frac{1}{3}\right) \text{ want } x = 0$$

(c) $p(x) = \frac{2}{x-3} + 1$

$$\therefore 0 = \frac{2}{x-3} + 1$$

$$\therefore -1 = \frac{2}{x-3}$$

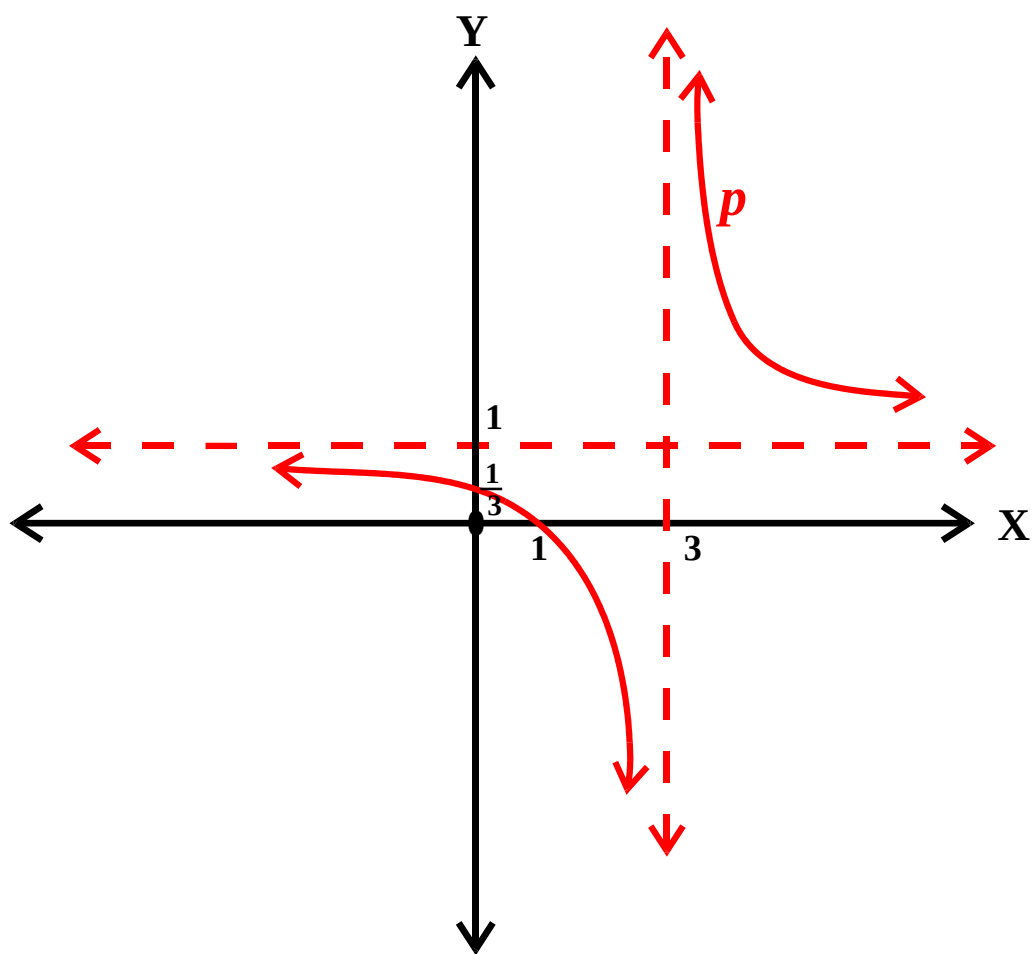
$$\therefore -x + 3 = 2$$

$$\therefore x = 1 \rightarrow x\text{-afsnit} (1; 0) \text{ want } y = 0$$

(d) Sien volgende bladsy.

(e) $q(x) = \frac{2}{x-3} + 3$

(d)

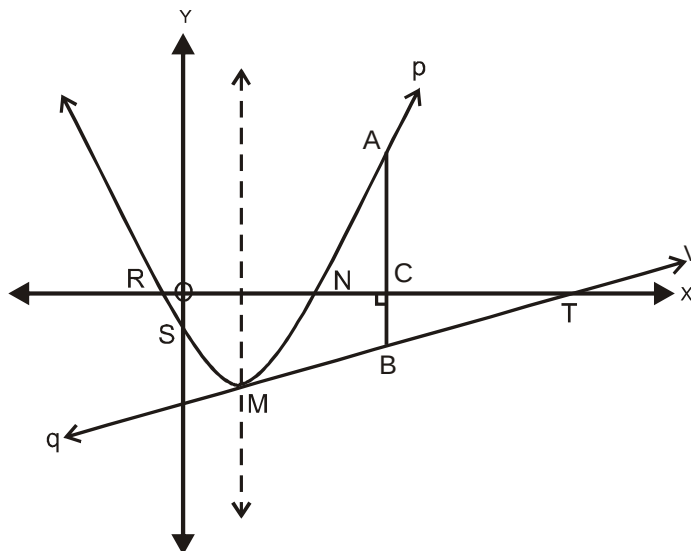


$$(2) f(x) = (x - 1)^2 - 4$$

$$g(x) = mx + c$$

$$\widehat{VTX} = 30^\circ$$

$$ACB \perp x\text{-as}$$



- Bereken die lengte van RN.
- Bereken die koördinate van M.
- Toon aan dat $g(x) = 0,6x - 4,6$.
- Bereken die lengte van CO indien $AB = 22$.
- As $h(x) = f(-x)$, verduidelik hoe die grafiek van h vanaf die grafiek van f verkry kan word. Skryf h se vergelyking neer.

(a) R en N is die x -afsnitte van f . $\therefore y = 0$

$$\therefore f(x) = y = 0 = (x - 1)^2 - 4$$

$$\therefore 4 = (x - 1)^2$$

$$\therefore \pm 2 = x - 1$$

$$\therefore x - 1 = 2 \quad \text{of} \quad x - 1 = -2$$

$$\therefore x = 3 \quad \quad \quad x = -1$$

$$\therefore \quad \quad \quad ON = 3 \quad \quad \quad OR = 1$$

$$\therefore \quad \quad \quad \mathbf{RN = 4}$$

(b) M is die draaipunt van f .

$$\therefore \mathbf{M(1; -4)}$$

Lees af van vergelyking f .

(c) $g:$ $y = mx + c$

met $m = \tan \theta$ en $\widehat{VTX} = 30^\circ$

$m = \tan 30^\circ \rightarrow m = 0,6$

$\therefore y = 0,6x + c$ deur $M(1; -4)$

$\therefore -4 = 0,6(1) + c$

$\therefore c = -4 - 0,6 = -4,6$

$\therefore g(x) = 0,6x - 4,6$

(d) $AB = [(x - 1)^2 - 4] - [0,6x - 4,6]$

$\therefore 22 = [x^2 - 2x + 1 - 4] - [0,6x - 4,6]$

$\therefore 22 = x^2 - 2x - 3 - 0,6x + 4,6$

$\therefore 0 = x^2 - 2,6x + 1,6 - 22$

$\therefore 0 = x^2 - 2,6x - 20,4$

$\therefore 0 = x^2 - \frac{26}{10}x - \frac{204}{10}$

$\therefore 0 = 10x^2 - 26x - 204$

$\therefore 0 = 5x^2 - 13x - 102$

$\therefore 0 = (5x + 17)(x - 6)$

$\therefore x = -\frac{17}{5}$ of $x = 6$

$\therefore OC = 6$

(e) $h(x) = f(-x)$ beteken dat h die refleksie van f in die y -as is.

$\therefore h(x) = f(-x) = [(-x) - 1]^2 - 4$

$\therefore h(x) = [-x - 1]^2 - 4$

$\therefore h(x) = [-1(x + 1)]^2 - 4$

$\therefore h(x) = (-1)^2(x + 1)^2 - 4$

$\therefore h(x) = (x + 1)^2 - 4$