S. 76/6 k)

$f(x) = \frac{8}{4-x^2}$

Def. lücken: $4 - x^2 = 0 \quad |-4 \quad :(-1)$

$x^2 = 4 \Rightarrow x = \pm 2$

$\Rightarrow \mathbb{D} = \mathbb{R} \setminus \{\pm 2\}$

Symmetrie: $f(-x) = \frac{8}{4-(-x)^2} = \frac{8}{4-x^2} = f(x)$

$\Rightarrow$ Achsensymmetrie

NS: $f(x) = 0 \Rightarrow$ keine NS

SP mit y-Achse: $f(0) = \frac{8}{4-0^2} = \frac{8}{4} = 2$

$\Rightarrow$ SP (0/2)

Verhalten an den Definitionslücken

Verhalten im Unendlichen:

$\lim\limits_{x \to \infty} \left(\frac{8}{4-x^2}\right) = \cancel{-\infty}\ 0 \qquad \lim\limits_{x \to -\infty} \left(\frac{8}{4-x^2}\right) = \cancel{\infty}\ 0$

Ableitung: $f'(x) = \frac{0 \cdot (4-x^2) - 8 \cdot (-2x)}{(4-x^2)^2} = \frac{-8 \cdot (-2x)}{(4-x^2)^2} = \frac{16x}{(4-x^2)^2}$

$f'(x) = 0 \Rightarrow 16x = 0 \quad |:(16)$

$\Rightarrow x = 0$

Definitionslücken!

| x | x<0 | x=0 | x>0 |
|---|---|---|---|
| f'(x) | + | 0 | - |
| f(x) | sms | Max (0/2) | smf |

| x | x<-2 | x=-2 | -2<x<0 | x=0 | 0<x<2 | x=2 | x>2 |
|---|---|---|---|---|---|---|---|
| f'(x) | - | / | - | 0 | + | / | + |
| f(x) | smf | Def. lücke | smf | Min (0/2) | sms | Def. lücke | sms |