

6b)  $f(x) = \frac{1}{6}(x+1)^2(x-2)$

◦  $D = \mathbb{R} \setminus \{-1, 2\}$

◦ Symmetrie:

$f(-x) = \frac{1}{6}(-x+1)^2(-x-2) \neq f(x)$

$-f(x) = -\left(\frac{1}{6}(x+1)^2(x-2)\right) = +\frac{1}{6}(+x+1)^2(-x+2) \neq f(-x)$

◦ Nullstellen:  $0 = \frac{1}{6}(x+1)^2(x-2)$   
 $\Rightarrow x_1 = -1 \quad x_2 = 2$

SP mit y-Achse:  $f(0) = -\frac{1}{3}$

◦ Verhalten im Unendlichen:

$\lim_{x \rightarrow \infty} f(x) = \infty$

$\lim_{x \rightarrow -\infty} f(x) = -\infty$

◦ Ableitung:

$f'(x) = \frac{1}{6}(x^2 + 2x + 1) \cdot (x-2) = \left(\frac{1}{6}x^2 + \frac{1}{3}x + \frac{1}{6}\right) \cdot (x-2)$

$f'(x) = \left(\frac{1}{3}x + \frac{1}{3}\right) \cdot (x-2) + \left(\frac{1}{6}x^2 + \frac{1}{3}x + \frac{1}{6}\right) \cdot 1 =$   
 $= \frac{1}{3}x^2 - \frac{2}{3}x + \frac{1}{3}x + \frac{2}{3} + \frac{1}{6}x^2 + \frac{1}{3}x + \frac{1}{6} = \underline{\underline{\frac{1}{2}x^2 + \frac{1}{2}x + \frac{5}{6}}}$

NS ~~8~~ ~~8~~  $x_1 = -1 \quad x_2 = 1$

x	$x < -1$	$x = -1$	$-1 < x < 1$	$x = 1$	$x > 1$
$f'(x)$	+	0	-	0	+
$f(x)$	↗ sms	Max (-1 0)	↘ smf	Min (1 -2/3)	↗ sms

