

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

1. Domaine de definition

$$\text{Dom } f = \mathbb{R} \setminus \{-1\}$$

2. Signe de f

x		$-\sqrt{3}$		-1		$\sqrt{3}$	
$\frac{x^2-3}{x+1}$	-	0	+		-	0	+

3. Limites et asymptotes

$$\lim_{x \rightarrow -1^-} \frac{x^2 - 3}{x + 1} = \infty$$

$$\lim_{x \rightarrow -1^+} \frac{x^2 - 3}{x + 1} = -\infty$$

$$\text{AV} \equiv x = -1$$

$$\lim_{x \rightarrow \infty} \frac{x^2 - 3}{x + 1} = \infty$$

$$\lim_{x \rightarrow -\infty} \frac{x^2 - 3}{x + 1} = -\infty$$

$$\text{AO} \equiv y = x - 1$$

4. Intersection avec les axes

$$G_f \cap X = \{(-\sqrt{3}, 0), (\sqrt{3}, 0)\}$$

$$G_f \cap Y = \{(0, -3)\}$$

5. Etude de f'

$$f'(x) = \frac{x^2 + 2x + 3}{(x + 1)^2}$$

x		-1	
$\frac{x^2+2x+3}{(x+1)^2}$	+		+

6. Etude de f''

$$f''(x) = -\frac{4}{(x + 1)^3}$$

x		-1	
$-\frac{4}{(x+1)^3}$	+		-

7. Tableau recapitulatif

x	$-\infty$		$-\sqrt{3}$		$-1$		$\sqrt{3}$		$\infty$
f(x)	$-\infty$	-	0	+		-	0	+	$\infty$
	$y = x - 1$								$y = x - 1$
pente	1	+	$\frac{-3+\sqrt{3}}{-2+\sqrt{3}}$	+		+	$\frac{3+\sqrt{3}}{2+\sqrt{3}}$	+	1
concavite	0	+	$\frac{4}{(-1+\sqrt{3})^3}$	+		-	$-\frac{4}{(1+\sqrt{3})^3}$	-	0

8. Graphe de f

