

Rational Function-General Form

The general form of a rational function is:

$$f(x) = \frac{ax+b}{cx+d}$$

where:

- $\text{dom}f = \mathbb{R} \setminus \{-\frac{d}{c}\}$
- $\text{ran}f = \mathbb{R} \setminus \{\frac{a}{c}\}$
- Vertical Asymptote: $x = -\frac{d}{c}$
- Horizontal Asymptote: $y = \frac{a}{c}$

Graph the following function:

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

First find values of a, c, d :

$$a = 2 \quad c = 1 \quad d = -1$$

Now find the equations of the asymptotes:

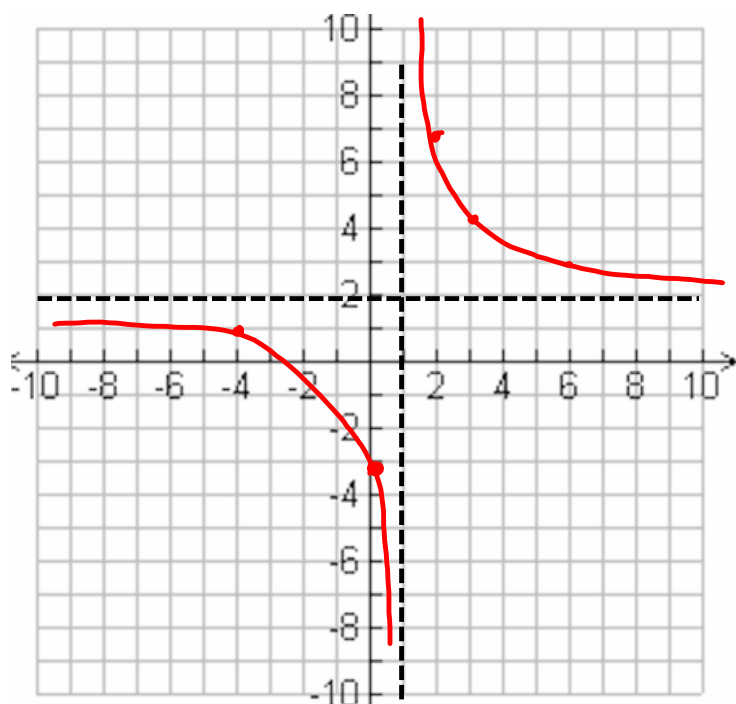
$$x = 1$$

$$y = \frac{2}{1} = 2$$

Table of Values:

x	-4	-3	-1	0	2	3	4	5	6
y	1	$\frac{3}{4}$	$-\frac{1}{2}$	-3	7	$\frac{9}{2}$	$\frac{11}{3}$	$\frac{13}{4}$	3

$$\frac{2x+3}{x-1}$$



Domf: $\mathbb{R} \setminus \{1\}$

Ranf: $\mathbb{R} \setminus \{2\}$

Zero:

Sign:

$$f(x) \geq 0:$$

$$f(x) \leq 0:$$

Variation:

Extrema: