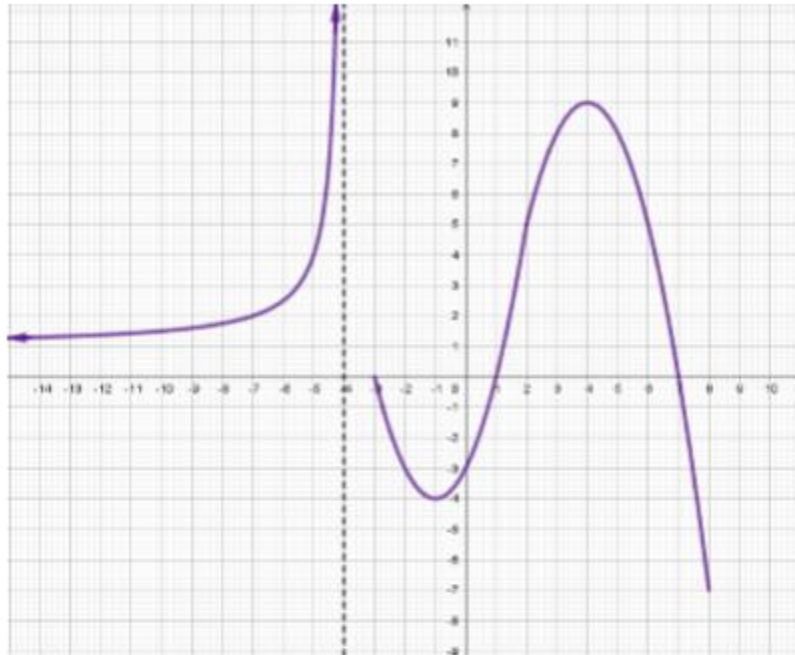


## FUNCTIONS TEST - 4° ESO

**Exercise 1: (1.5 ptos)** Given the following graph of a certain function (the distance between consecutive marks in the axes is one):



- Indicate the domain and the image
- Study the monotony
- Indicate the relative and absolute extrema

**Exercise 2: (2 ptos)** Find the domain of the following functions:

a)  $f(x) = \frac{x^2 + 7x + 6}{x^2 - 9}$  (0.5)

b)  $f(x) = \frac{1}{\sqrt{x^2 + x - 6}}$  (0.75)

c)  $f(x) = \frac{\sqrt{x+1}}{x^2 - 4}$  (0.75)

**Exercise 3: (2 ptos)** Work out:

a)  $\lim_{x \rightarrow 2} \frac{1-x}{x-2} =$  (0.5)

b)  $\lim_{x \rightarrow 1} \frac{x^2 - 2x + 1}{x^2 + 2x - 3} =$  (0.75)

c)  $\lim_{x \rightarrow +\infty} \left( \frac{x^2 - 2x}{x+1} - x \right) =$  (0.75)

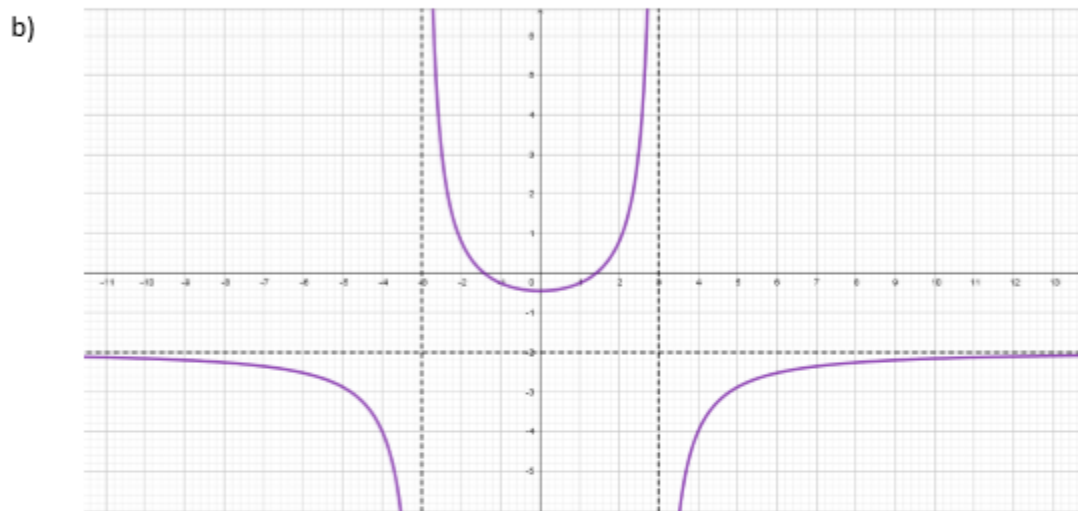


**Exercise 4: (0.75 pts)** Find the **general** equation of the straight line that goes through the points  $A(-7,2)$  and  $B(5,4)$

**Exercise 5: (1 pt)** Plot the graph of the function  $f(x) = -x^2 - 2x + 8$ , finding the points where it crosses the axes, the coordinates of the vertex and as many more points as necessary

**Exercise 6: (1 pt)** Find the asymptotes of the following functions:

a)  $f(x) = \frac{3x^2 - 7x + 1}{x^2 - 25}$



**Exercise 7: (1.75 pts)** Sketch the graph of the piecewise function

$$f(x) = \begin{cases} x+3 & x \leq -1 \\ x^2 - 4 & -1 < x < 3 \\ 5 & 3 \leq x < 7 \end{cases}$$

