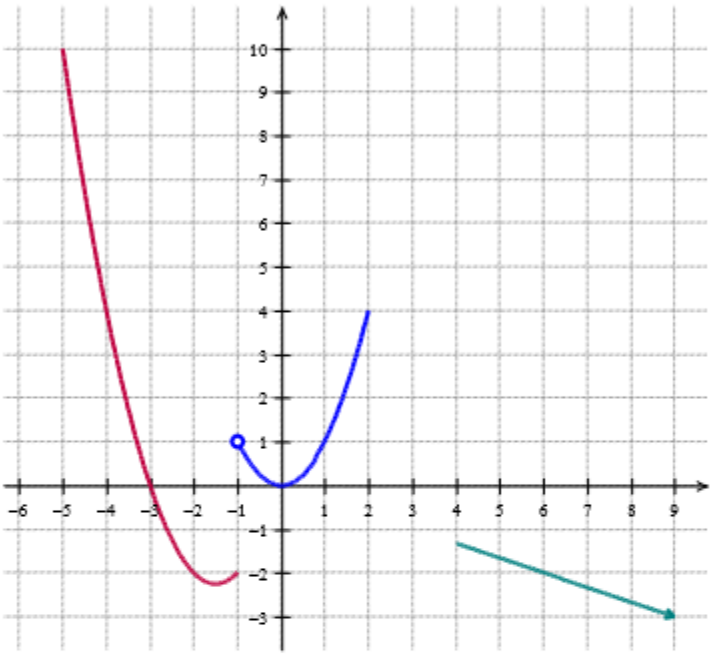
FUNCTIONS TEST – 3º ESO

Exercise 1: (1 point) Work out the domain of the following functions:

a) $f(x)=x^2-9$ b) $f(x)=\dfrac{x^4-5x^3+7x^2-8x+10}{x+17}$ c) $f(x)=\dfrac{17}{x^2-8x+7}$

Exercise 2: (2 points) Given the following graph of a certain function:



a) Indicate its domain and its image. Is it a continuous function? Why?
b) Determine the points where the function crosses the axes
c) Study its monotony
d) Study the local and global extrema

Exercise 3: (1 point) Plot the graph of a function that fulfills all the following characteristics at the same time:

a) Its domain is $[-8,-2]\cup(2,+\infty)$
b) It crosses the axes at the points $(-5,0)$, $(0,7)$ and $(3,0)$
c) It has minima at $x=-6$ and $x=5$ and a maximum at $x=-3$, either local or global

Exercise 4: (2.25 points)

a) Work out the equation of the straight line that passes through the points $P(-2,5)$ and $Q(2,17)$
b) Work out the general equation of the straight line that passes through the point $P(-7,0)$ with a slope $m=-5$
c) Work out the equation of the straight line that is parallel to $x-2y+12=0$ and passes through the point $A(-1,4)$. What's the value of the slope?

Exercise 5: **(1.75 points)** Plot the graph of the function $f(x) = -x^2 + 8x - 12$, indicating its direction, studying the points where it crosses the axes and finding the coordinates of the vertex. Construct also a table with a couple of values.

Exercise 6: **(2 points)** Plot the graph of the piecewise function given below

$$f(x) = \begin{cases} 1 - 2x & x \leq -2 \\ x^2 - 1 & -2 < x < 3 \\ 8 & 3 < x \leq 9 \end{cases}$$