FUNCTIONS TEST - 3º ESO

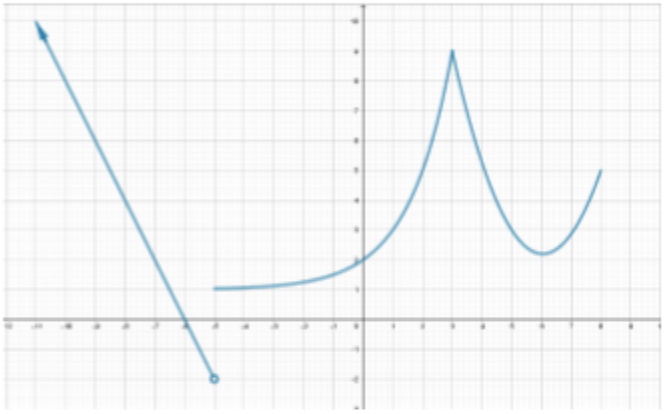
Exercise 1: (1.5 points) Find the domain of the following functions:

a) $f(x)=\dfrac{x^2+7x+6}{3x+7} \rightarrow \text{Dom } f=\mathbb{R}-\left\{\dfrac{-7}{3}\right\}$

b) $f(x)=\dfrac{\sqrt[3]{x^2-4}}{x^2-9} \rightarrow \text{Dom } f=\mathbb{R}-\{\pm 3\}$

c) $f(x)=\sqrt{5-x} \rightarrow \text{Dom } f=(-\infty,5]$

Exercise 2: (1.75 ptos) Given the graph of the following function:



a) Indicate its domain and its image

$\text{Dom } f=(-\infty,-5)\cup[5,8]=(-\infty,8] \qquad \text{Im } f=(-2,+\infty)$

b) Indicate the point where the function crosses the axes $\underline{OX}]\ x=-6 \qquad \underline{OY}]\ y=2$

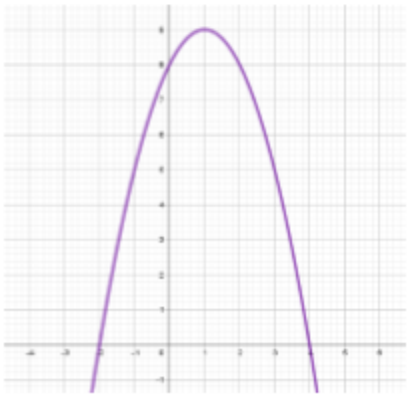
c) Study its monotony Increases: $(-5,3)\cup(6,8)$ Decreases: $(-\infty,-5)\cup(3,6)$

d) Study the extrema

Relative maxima: $x=3,\quad x=8$ Absolute maximum: $\nexists$

Relative minima: $x=-5\quad x=6$ Absolute minimim: $\nexists$

Exercise 3: (1.25 points) Plot the graph of the parabola $f(x)=-x^2+2x+8$, studying the points where it crosses the axes, the coordinates of the vertex and finding as many more points as necessary

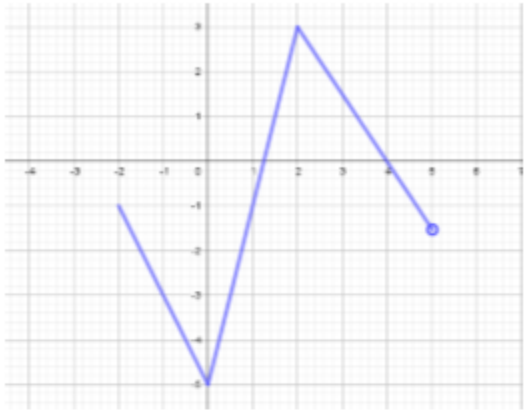


Exercise 4: (1 point) Plot the graph of a function that fulfills all the following conditions at the same time:

a) $\text{Dom}\, f = [-2, 5)$

b) It crosses the axes at the points $x = -3$, $x = 4$ and $y = -5$

c) $x = 2$ is a maximum



Exercise 5: (2.5 points)

a) Find the equation of the straight line that goes through the points $P(-2, 7)$ and $Q(5, -1)$

$$\boxed{y = \frac{33 - 8x}{7}}$$

b) Given the equation of the straight line $9x + 14y - 5 = 0$

b1) Find its slope and the y-intercept $\begin{cases} m = -9/14 \\ n = 5/14 \end{cases}$

b2) Find the equation of a parallel line that goes through the point $A(-2, 1)$ $\boxed{9x + 14y + 4 = 0}$

c) Find the **general** equation of the straight line given by $y = \frac{5 - 3x}{7}$ $\rightarrow$ $\boxed{3x + 7y - 5 = 0}$

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

$$f(x) = \begin{cases} 2 & -7 \le x < -3 \\ x + 5 & -3 < x \le 2 \\ x^2 - 10x + 21 & x > 2 \end{cases}$$