

FUNCTIONS TEST – 3º ESO

Exercise 1: (3.25 ptos)

- a) Find the **general** equation of the straight line that goes through the points $A(-2,5)$ and $B(3,7)$

$$2x - 5y + 29 = 0$$

- b) Given the straight line $4x - 3y + 9 = 0$ find the values of the slope and the y-intercept

$$\begin{cases} m = 4/3 \\ n = 3 \end{cases}$$

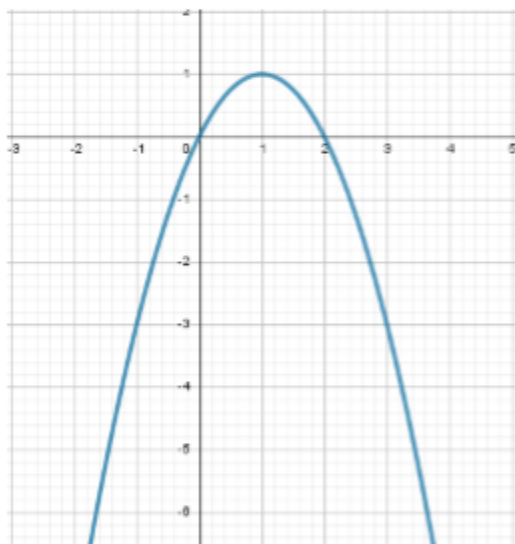
- c) Find a straight line that's parallel to $3x - 5y - 10 = 0$ and goes through the point $P(-3,4)$

$$3x - 5y + 29 = 0$$

- d) Find the equation of the straight line with a slope $m = -5$ that goes through the point $Q(1,-4)$

$$y = -5x + 1$$

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



Exercise 3: (1.5 ptos) Find the domain of the following functions:

a) $f(x) = \frac{\sqrt[3]{x-1}}{x^2 - 5x + 6} \rightarrow \text{Dom } f = \mathbb{R} - \{2, 3\}$

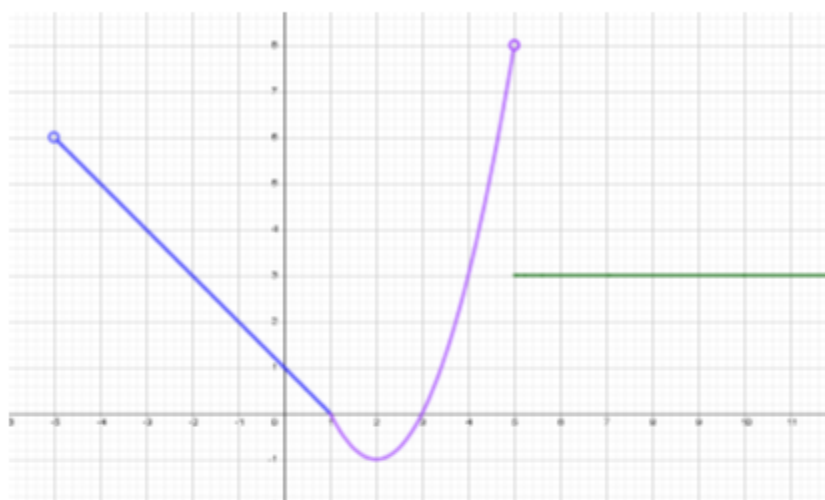
b) $f(x) = \frac{x^2 - 4}{\sqrt{x-9}} \rightarrow \text{Dom } f = (9, +\infty)$

c) $f(x) = \sqrt[4]{x+1} \rightarrow \text{Dom } f = [-1, +\infty)$

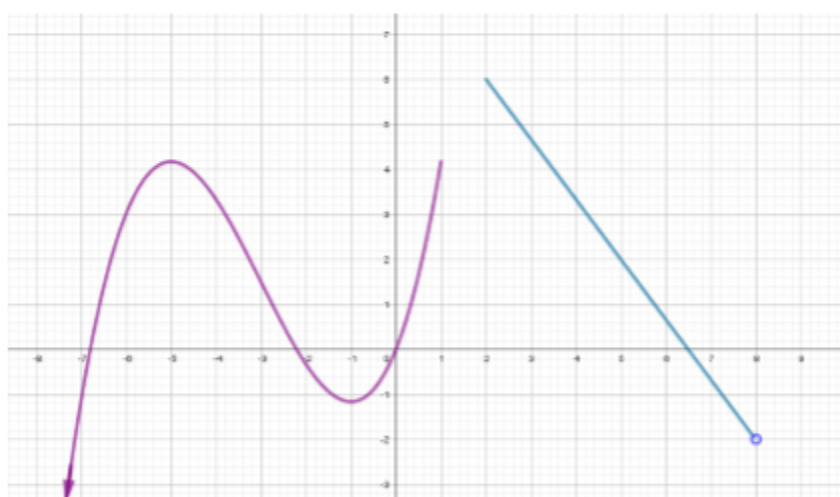


Exercise 4: (2 ptos) Plot the graph of the piecewise function:

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



Exercise 5: (2 ptos) Given the graph of a certain function:



a) Indicate its domain and its image

$$\text{Dom } f = (-\infty, 1] \cup [2, 8) \quad \text{Im } f = (-\infty, 6]$$

b) Indicate the points where the function crosses the axes

$$\underline{OX} \mid x = -6.8, \quad x = -2.2, \quad x = 0, \quad x = 6.5 \quad \underline{OY} \mid y = 0$$

c) Study its monotony **Increases:** $(-\infty, -5) \cup (-1, 1)$ **Decreases:** $(-5, -1) \cup (2, 8)$

d) Study the extrema

$$\text{Relative maxima: } x = -5, \quad x = 1, \quad x = 2 \quad \text{Absolute maximum: } x = 2$$

$$\text{Relative minima: } x = -1 \quad \text{Absolute minimum: } \nexists$$

