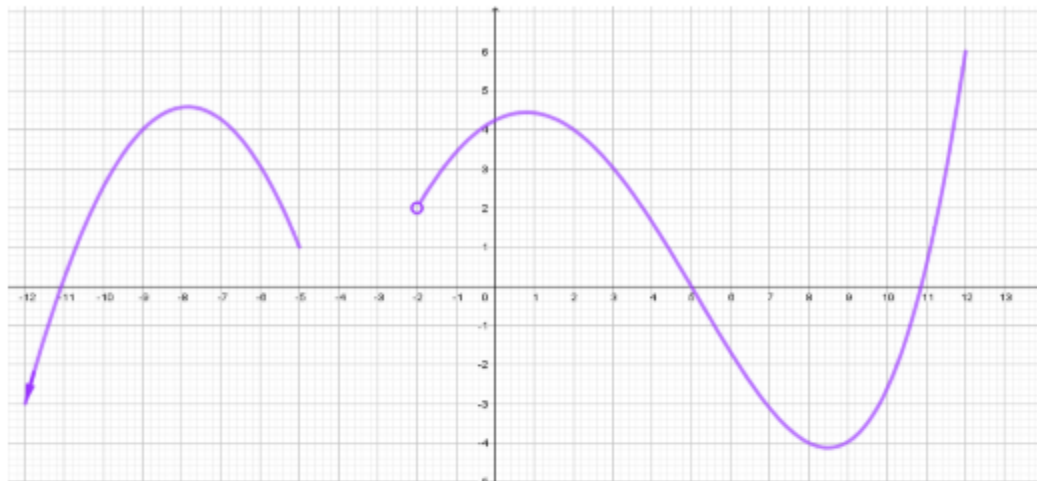


FUNCTIONS TEST - 3º ESO

Exercise 1: (0.5 points) Write the equation of a convex parabola that crosses the x-axis at $x = -1$ and $x = 5$. What's the x-coordinate of the vertex?

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



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

Exercise 3: (1.75 points) Draw the graph of the function $f(x) = -x^2 + 3x + 4$, indicating its direction, studying the points where it crosses the axes and finding the coordinates of the vertex. Construct also a table with at least a couple of values.

Exercise 4: (2.25 points)

- Work out the equation of the straight line that passes through the points $A(5, -2)$ and $B(7, -9)$
- Work out the general equation of the straight line that passes through the point $P(-5, 4)$ and has a slope $m = -3$
- Work out the explicit equation of the straight line that is parallel to $7x - 4y - 9 = 0$ and passes through the point $Q(5, 7)$. Indicate the slope and the y-intercept.

Exercise 5: (1 point) Indicate the domain of the following functions:

- $y = x^2 - 5x + 6$
- $y = \frac{3x - 6}{x^2 - 9}$
- $y = \frac{2}{\sqrt{x}}$

Exercise 6: (2.5 points) Plot the graph of the piecewise function given below

$$f(x) = \begin{cases} 4 & x \leq -1 \\ 2x - 6 & -1 < x < 3 \\ x^2 - 9x + 18 & 3 < x \leq 6 \end{cases}$$