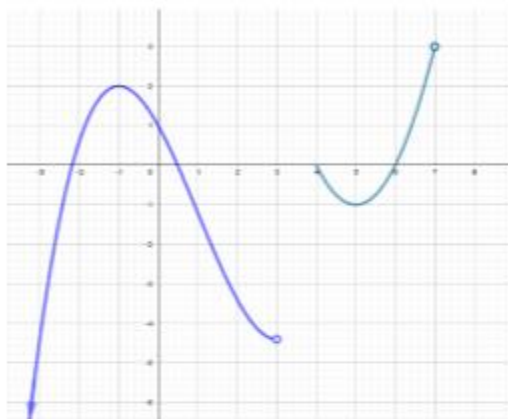




FUNCTIONS TEST - 4° ESO



Exercise 1: (1.5 ptos) Given the following graph of a certain function:



- a) Indicate the domain and the image $\text{Dom } f = (-\infty, -3) \cup [4, 7)$ $\text{Im } f = (-\infty, 3)$
 b) Study the monotony **Increases:** $(-\infty, -1)$ and $(5, 7)$ **Decreases:** $(-1, 3)$ and $(4, 5)$
 c) Indicate the relative and absolute extrema
 Relative maxima: $x = -1, x = 4$ **Absolute maximum:** $\cancel{\neq}$
 Relative minima: $x = 4$ **Absolute minimum:** $\cancel{\neq}$

Exercise 2: (1.5 ptos)

- a) Find the **general** equation of the straight line that goes through the points $A(-3, 4)$ and $B(5, 2)$
 $x + 4y - 13 = 0$
 b) Find a straight line that's parallel to $r \equiv 5x - y - 9 = 0$ going through the point $P(-4, 2)$
 $5x - y + 22 = 0$

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

- a) $f(x) = \frac{\sqrt{x+1}}{x^2-4}$ \rightarrow $\text{Dom } f = [-1, 2) \cup (2, +\infty)$
 b) $f(x) = \sqrt{x^2 - x - 12}$ \rightarrow $\text{Dom } f = (-\infty, -3] \cup [4, +\infty)$

Exercise 4: (1.75 ptos) Work out:

- a) $\lim_{x \rightarrow 3} \frac{x^2 - 6x + 9}{x^2 - 4x + 3} = 0$
 b) $\lim_{x \rightarrow 1} \frac{2x + 3}{x - 1} = \cancel{\neq}$



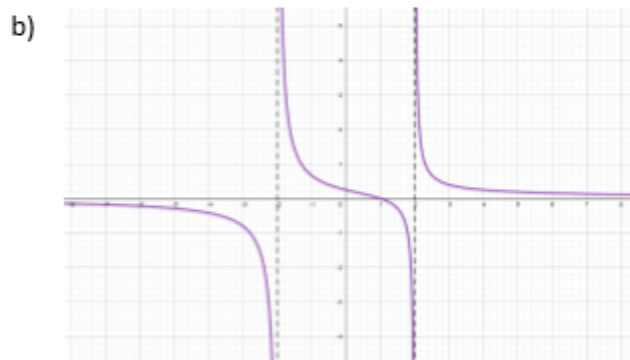
$$c) \lim_{x \rightarrow +\infty} \left(\frac{x^2 - 2x}{x-1} - x \right) = -1$$

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



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

$$a) f(x) = \frac{3x^2 - 7x}{2x^2 - 2} \rightarrow \begin{cases} \text{HA} & y = 3/2 \\ \text{VA} & x = \pm 1 \end{cases}$$



$$\begin{cases} \text{HA} & y = 0 \\ \text{VA} & x = \pm 2 \end{cases}$$

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

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

