THIRD TERM GLOBAL TEST

3º ESO

Exercise 1: (2 points) Factorize the following polynomials and indicate their roots:

$P(x)=x^4+x^3-5x^2+3x \rightarrow \begin{cases} x=0,\ x=1 \text{ double},\ x=-3 \\ x(x-1)^2(x+3) \end{cases}$

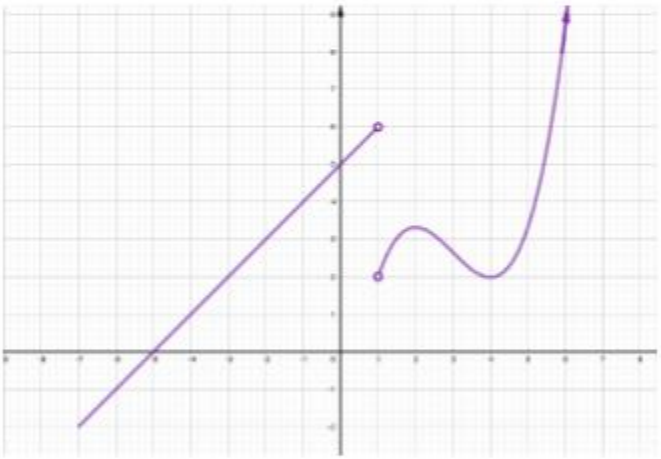
$Q(x)=x^4+11x^3+43x^2+69x+36 \rightarrow \begin{cases} x=-1,\ x=-3 \text{ double},\ x=-4 \\ (x+1)(x+3)^2(x+4) \end{cases}$

Exercise 2: (1.25 points) Find the domain of the following functions:

a) $f(x)=\dfrac{x-1}{x^2-5x-6} \rightarrow \text{Dom } f=\mathbb{R}-\{-1,6\}$ (0.75)

b) $f(x)=\dfrac{2x-5}{\sqrt{x-7}} \rightarrow \text{Dom } f=(7,+\infty)$ (0.5)

Exercise 3: (1.75 points) Given the graph of a certain function:



a) Find its domain and its image $\text{Dom } f=[-7,1)\cup(1,+\infty)$ $\text{Im } f=[-2,+\infty)$

b) Indicate the point where the function crosses the axes $\underline{OX}\rceil\ x=-5$ $\underline{OY}\rceil\ y=5$

c) Study the monotony

Increases: $(-7,1)$ and $(1,2)$ and $(4,+\infty)$

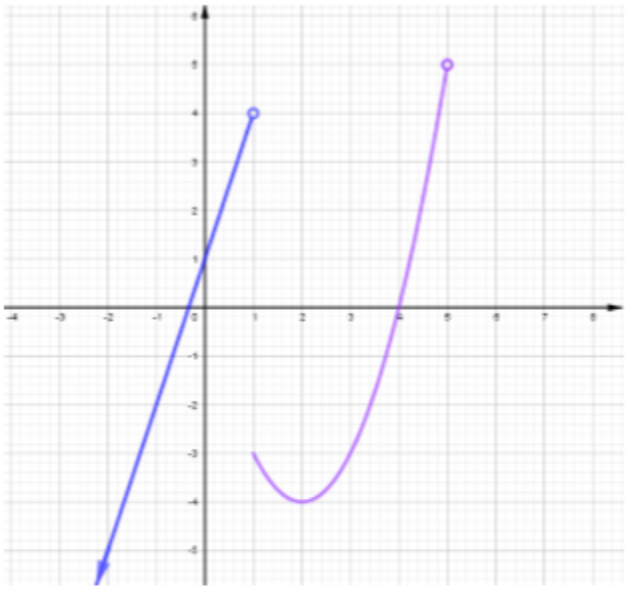
Decreases: $(2,4)$

d) Study the extrema

Relative maxima: $x=2$ Absolute maximum: $\nexists$

Relative minima: $x=-7,\ x=4$ Absolute minimum: $x=-7$

Exercise 4: (2 points) Plot graph of the function $f(x)=\begin{cases}3x+1 & x<1\\ x^2-4x & 1\le x<5\end{cases}$



Exercise 5: (1 point) Find the axial diagonal of a cuboid if the sides measure 5 cm, 8 cm and 10 cm

The diagonal measures 13.75 cm

Exercise 6: (2 points)

a) **(1)** Find the general equation of the line that goes through the points $A(5,-3)$ and $B(8,6)$

$\boxed{3x-y-18=0}$

b) **(0.5)** Find a parallel line to $7x-2y-8=0$ going through the point $P(-1,5)$

$\boxed{7x-2y+17=0}$

c) **(0.5)** Indicate the slope of the straight line $7x-2y-8=0$ (yup, it's the same one)

$\boxed{m=\frac{7}{2}}$