FRACTIONS, EQUATIONS, INEQUALITIES AND SYSTEMS TEST - 4º ESO

Exercise 1: (2.5 points) Solve the following non-linear simultaneous equations with two variables:

a) $\left.\begin{matrix} x+3y=2 \\ x^2-5y^2=20 \end{matrix}\right\} \rightarrow$ $\boxed{x=5 \rightarrow y=-1}$ $\boxed{x=-10 \rightarrow y=4}$ **(1)**

b) $\left.\begin{matrix} xy=10 \\ x^2-4y^2=9 \end{matrix}\right\} \rightarrow$ $\boxed{x=5 \rightarrow y=2}$ $\boxed{x=-5 \rightarrow y=-2}$ **(1.5)**

Exercise 2: (2.75 points) Work out:

a) $\left(\frac{15}{x-1}-\frac{5}{x^2-1}\right):\frac{3x+2}{x+1}=\frac{5}{x-1}$ **(1.25)**

b) $\frac{x^2-4x-5}{x^3+2x^2+x}\cdot\frac{x^3-x}{x^2-25}=\frac{x-1}{x+5}$ **(0.75)**

c) $(x-1)^2-3x\geq(x+5)^2 \rightarrow x\in\left(-\infty,\frac{-8}{5}\right]$ **(0.75)**

Exercise 3: (1.75 points) Solve the following radical equations:

a) $\sqrt{3x-6}+x=8 \rightarrow \boxed{x=5}$

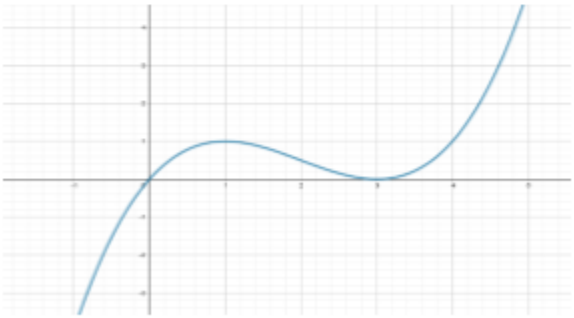
b) $\sqrt{4x+1}-\sqrt{x-1}=2 \rightarrow \boxed{x=2}$ $\boxed{x=10/9}$

Exercise 4: (2.5 points) Solve the following systems of inequalities:

a) $\left.\begin{matrix} x^2-5x<0 \\ 9-x^2\geq 0 \end{matrix}\right\} \rightarrow \boxed{x\in(0,3]}$

b) $\left.\begin{matrix} x^2+3x-10\geq 0 \\ x^2-4\leq 0 \end{matrix}\right\} \rightarrow \boxed{x=2}$

Exercise 5: (0.5 points) Find the points where $f(x)>0$:



$\boxed{x\in(0,3)\cup(3,+\infty)}$