FIRST TERM GLOBAL TEST
4° ESO

Exercise 1: (1 pto) Given the polynomial $P(x)=5x^3+ax^2+bx+4$ find the values of a and b so that when dividing by $(x+1)$ the remainder is 3 and when dividing by $(x-2)$ the remainder is 54

$a=3 \qquad b=-1$

Exercise 2: (2 ptos) Work out:

a) $\left.\begin{matrix} xy=12 \\ 2x^2-y^2=2 \end{matrix}\right\} \rightarrow \boxed{\begin{matrix} x=3, \quad y=4 \\ x=-3, \; y=-4 \end{matrix}}$

b) $\left.\begin{matrix} 2x-y=6 \\ 3x^2-y^2=59 \end{matrix}\right\} \rightarrow \boxed{\begin{matrix} x=19, \; y=32 \\ x=5, \quad y=4 \end{matrix}}$

Exercise 3: (1 pto) Solve and factorize $P(x)=x^6-6x^5+9x^4+4x^3-12x^2=0$

Roots: $x=0$ double, $\quad x=-1, \quad x=2$ double, $\quad x=3$

Factorization: $x^2(x+1)(x-2)^2(x-3)$

Exercise 4: (2 ptos) Work out:

a) $\left.\begin{matrix} x^2-9\geq 0 \\ 5x-x^2>0 \end{matrix}\right\} \rightarrow \; x\in[3,5)$

b) $\left.\begin{matrix} 5(x-2)-3x\geq 7x-4 \\ x^2+4x-5<0 \end{matrix}\right\} \rightarrow \; x\in\left(-5,\frac{-6}{5}\right]$

Exercise 5: (1.5 ptos)

a) Work out: $\sqrt{x+5}+\sqrt{x-3}=2 \;\rightarrow$ It has no solution. You get $x=4$, but it doesn't work

b) Rationalize and simplify if possible: $\dfrac{4-\sqrt{2}}{4+\sqrt{2}}=\dfrac{9-4\sqrt{2}}{7}$

Exercise 6: (2.5 ptos) Work out:

a) $\frac{x^2-2}{x^2+2x-15}+\frac{x}{x+5}-\frac{x-1}{x-3}=\frac{x^2-7x+3}{x^2+2x-15}$

b) $\frac{3x^2-6x}{x^2+x}\cdot\frac{x^2+3x+2}{x^2-4}=3$

c) $\frac{x^2-6x+9}{x^2-25}:\frac{x^2-3x}{x+5}=\frac{x-3}{x^2-5x}$