REAL NUMBERS, POLYNOMIALS AND FRACTIONS TEST - 4º ESO

Exercise 1: (1.25 point) Work out $\dfrac{\log_9 875-\log_9 7}{\log_9 25+\log_9 625}=\dfrac{1}{2}$

Exercise 2: (1 point) Solve and factorize the equation $x^6-13x^4+36x^2=0$

$x=0$ double, $x=\pm 2$, $x=\pm 3$ $\rightarrow$ $x^2(x+2)(x-2)(x+3)(x-3)$

Exercise 3: (1.75 points) Rationalize the following expressions:

a) (0.25) $\dfrac{12}{\sqrt{3}}=4\sqrt{3}$ b) (0.5) $\dfrac{35}{\sqrt[4]{5}}=7\sqrt[4]{5^3}$ c) (1) $\dfrac{\sqrt{10}+\sqrt{2}}{\sqrt{10}-\sqrt{2}}=\dfrac{3+\sqrt{5}}{2}$

Exercise 4: (2.25 points) Work out the value of the following expressions and simplify if possible:

a) $\dfrac{x-5}{x^2+4x-21}-\dfrac{2x-1}{x+7}+\dfrac{3x}{x-3}=\dfrac{x^2+29x-8}{x^2+4x-21}$ (1.25)

b) $\dfrac{x^2-1}{x^2+6x+5}:\dfrac{3x-3}{x^2+10x+25}=\dfrac{x+5}{3}$ (1)

Exercise 5: (1 point) Study the following unions and intersections of intervals and **write them as inequalities** too:

a) $[-2,0)\cap(-3,7]=[-2,0)$ $\rightarrow$ $-2\le x<0$

b) $(-\infty,2]\cup(2,5]=(-\infty,5]$ $\rightarrow$ $x\le 5$

Exercise 6: (2.75 points) Work out, express as a single radical and simplify if possible:

a) $5\sqrt{448}-\sqrt{405}-2\sqrt{500}-\sqrt{7}=39\sqrt{7}-29\sqrt{5}$ (1)

b) $\sqrt[6]{x^{-5}}:\sqrt[4]{x^3}\cdot\sqrt{x^{-1}}=\dfrac{1}{x^2}\sqrt[12]{\dfrac{1}{x}}$ (0.75)

c) $\dfrac{\sqrt[3]{a^{-2}\cdot b^5}\cdot\sqrt{a}}{\sqrt[5]{a^2\cdot b^{-3}}}=b^2\cdot\sqrt[30]{\dfrac{b^8}{a^{17}}}$ (1)