REAL NUMBERS, POWERS AND ROOTS TEST

3º ESO

Exercise 1: (1 point) Classify the following numbers:

a) $0.\overline{435}$ $\mathbb{Q},\mathbb{R}$ b) $\sqrt[5]{-1}$ $\mathbb{Z},\mathbb{Q},\mathbb{R}$ c) $\frac{14}{7}$ $\mathbb{N},\mathbb{Z},\mathbb{Q},\mathbb{R}$ d) $\sqrt[4]{-81}$ $\nexists$ e) $\sqrt{3}$ $I,\mathbb{R}$

Exercise 2: (1 point) The flying distance between Córdoba and New York is of $5859.4\ \text{km}$. Find the percentage error if I round it to $5800\ \text{km}$. Is it a good approximation? Why?

$E_p = 1.01\%$, just over the limit, so it could be considered a good one... or not

Exercise 3: (2 points) Work out:

a) $3.12\cdot10^4 - 1.7\cdot10^6 + 7.29\cdot10^5 = -9.4\cdot10^5$

b) $5.71\cdot10^{-4} - 2.93\cdot10^{-6} + 3.27\cdot10^{-5} = 6.01\cdot10^{-4}$

c) $\left(5.73\cdot10^{-3}\right)\cdot\left(4.18\cdot10^{-7}\right) = 2.4\cdot10^{-9}$

d) $\left(4.17\cdot10^{5}\right):\left(7.98\cdot10^{-7}\right) = 5.23\cdot10^{11}$

Exercise 4: (1.5 points) Study the following unions and intersections of intervals. Express them as **inequalities** too:

a) $(-1,3)\cap(-3,0] = (-1,0] \rightarrow -1 < x \leq 0$

b) $(-5,2]\cup(2,7] = (-5,7] \rightarrow -5 < x \leq 7$

c) $(-\infty,2]\cap[0,+\infty) = [0,2] \rightarrow 0 \leq x \leq 2$

Exercise 5: (1 point) Work out and simplify if possible:

a) $\sqrt[3]{250047} = 63$

b) $\sqrt[5]{\frac{a^{27}\,b^{-83}\,c^{95}}{d^{-34}}} = \frac{a^5c^{19}d^6}{b^{16}}\sqrt[5]{\frac{a^2d^4}{b^3}}$

Exercise 6: (3.5 points) Work out, express as a single radical and simplify if possible:

a) $\sqrt{128} + 2\sqrt{392} - 5\sqrt{200} = -14\sqrt{2}$ (1)

b) $\frac{\sqrt[6]{a^3\cdot b^{-4}}\cdot\sqrt{a^{-2}\cdot b}}{\sqrt[5]{a^{-1}\cdot b^2}} = \sqrt[30]{\frac{1}{a^9b^{17}}}$ (1.25)

c) $\sqrt[3]{x^{-8}}\cdot\sqrt[5]{x} : \sqrt{x^{-3}} = \sqrt[30]{\frac{1}{x^{29}}}$ (0.75)

d) $\sqrt[7]{2^{-11}} : \sqrt[5]{2^{-1}} = \frac{1}{2}\ \sqrt[35]{\frac{1}{2^{13}}}$ (0.5)