REAL NUMBERS, POWERS AND ROOTS TEST

3º ESO

Exercise 1: (3.5 points) Work out, express as a single radical and simplify if possible:

a) $\sqrt[5]{x^{-7}} : \sqrt[7]{x} = \frac{1}{x} \cdot \sqrt[35]{\frac{1}{x^{19}}}$ (0.5)

b) $\frac{\sqrt[5]{a^3} \cdot \sqrt[7]{a^{-2}}}{\sqrt{a^{-1}}} = \sqrt[70]{a^{57}}$ (0.75)

c) $\frac{\sqrt[4]{x^2 \cdot y^{-3}} \cdot \sqrt[5]{x^{-4} \cdot y^2}}{\sqrt{x^{-1} \cdot y}} = \sqrt[20]{\frac{x^4}{y^{17}}}$ (1.25)

d) $3\sqrt{192} - \sqrt{147} - 2\sqrt{1875} = -33\sqrt{3}$ (1)

Exercise 2: (2.5 points) Work out:

a) $\left(2.49 \cdot 10^{-1}\right) \cdot \left(8.29 \cdot 10^{-4}\right) = 2.06 \cdot 10^{-4}$ (0.5)

b) $\left(3.52 \cdot 10^{3}\right) : \left(8.15 \cdot 10^{-5}\right) = 4.32 \cdot 10^{7}$ (0.5)

c) $2.34 \cdot 10^{5} - 3.45 \cdot 10^{6} + 4.56 \cdot 10^{7} = 4.24 \cdot 10^{7}$ (0.75)

d) $7.65 \cdot 10^{-5} - 6.54 \cdot 10^{-4} + 5.43 \cdot 10^{-6} = -5.72 \cdot 10^{-4}$ (0.75)

Exercise 3: (1.75 points) Study the following unions and intersections of intervals. Express them as **inequalities** too:

a) $(-2,4) \cup [4,9] = (-2,9] \rightarrow -2 < x \leq 9$

b) $(0,2] \cap [2,8) = \{2\} \rightarrow x = 2$

c) $(-\infty,1] \cup [-5,0) = (-\infty,1] \rightarrow x \leq 1$

d) $(-\infty,3] \cap [4,9) = \varnothing$

Exercise 4: (1.25 points) I'm going to bake a pumpkin and carrot cake for Halloween. The recipe says that I need half a kilo of pumpkins and 300 gr of carrots, but I only have 475 gr of pumpkins and a quarter of a kilo of carrots. Find the percentage errors for both of them and tell me if you think that the recipe is going to work fine.

The error for the pumpkins is of 5%, and for the carrots is 16.67% and I don't care what the theory says, I'm gonna bake my cake because I am very hungry

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

a) $\sqrt[5]{248832} = 12$

b) $\sqrt[7]{\frac{a^{-39} b^{97} c^{42}}{d^{-51}}} = \frac{b^{13} c^6 d^7}{a^5} \cdot \sqrt[7]{\frac{b^6 d^2}{a^4}}$