CONTROL TEMA 1. **NOMBRE:**

1. (1,5)Racionaliza:

   a. $\frac{6+\sqrt{5}}{\sqrt{3}-\sqrt{7}}$ b. $\frac{-2}{\sqrt{8}-\sqrt{3}+\sqrt{6}}$

2. (1)Calcula y expresa el resultado en notación científica:

$$\frac{2{,}43\cdot 10^{-3}\cdot(-4{,}17\cdot 10^{2}+3{,}27\cdot 10^{-2})^{3}}{6{,}127\cdot 10^{3}+6{,}03\cdot 10^{-1}}=$$

3. (1)Escribe las aproximaciones a las millonésimas del número 9,0325874256. Calcula el error absoluto y el error relativo.

4. (1,5) Calcula y simplifica:

   a. $4\sqrt[4]{64}-\frac{1}{4}\sqrt[4]{5000}+\frac{2}{5}\sqrt[4]{\frac{216}{16}}=$

   b. $\sqrt[5]{\frac{\sqrt{36\sqrt[4]{18}\cdot\left(\sqrt[5]{96}\right)^{3}}}{\sqrt[6]{84}}}$

   c. $\frac{(-16)^{3}(-48)^{4}54^{2}(-8)^{-2}}{40^{4}(-24)^{2}15^{-3}}$

5. (1) Representa en la recta real $\sqrt{39}, -\frac{53}{7}$

6. (1)Si log 2=0,3010, log 3= 0,4771, log 5= 0,6990. Calcula:

   a. $\log\sqrt[5]{\frac{1}{0{,}32}}$ *b.* $\log\frac{405}{8}$

7. (1) Escribe el entorno, el intervalo y representa:

   a. $|x+4|\geq 8$ *b.* $|x-5|<2$

8. (1) Escribe la expresión algebraica de:

   $\log A=3+4\log x-\frac{1}{6}\log(y)+5\log z-2\log\frac{z}{y}$

9. (1) Calcula $|x-6|-|3x+4|$

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TEMA 1. (2) 2020.

① (1,5) a) $\frac{6+\sqrt5}{\sqrt{3-\sqrt7}} = \frac{(6+\sqrt5)\sqrt{3-\sqrt7}}{(\sqrt{3-\sqrt7})^2} = \frac{(6+\sqrt5)\sqrt{3-\sqrt7}}{3-\sqrt7} = \frac{(6+\sqrt5)(\sqrt{3-\sqrt7})(3+\sqrt7)}{(3-\sqrt7)(3+\sqrt7)} =$

$= \frac{(6+\sqrt5)(\sqrt{3-\sqrt7})(3+\sqrt7)}{9-7} = \frac{(6+\sqrt5)(\sqrt{3-\sqrt7})(3+\sqrt7)}{2}$

b) $\frac{-2[\sqrt8-\sqrt3-\sqrt6]}{[(\sqrt8-\sqrt3)+\sqrt6][(\sqrt8-\sqrt3)-\sqrt6)} = \frac{-2[\sqrt8-\sqrt3-\sqrt6]}{(\sqrt8-\sqrt3)^2-6} =$

$= \frac{-2[\sqrt8-\sqrt3-\sqrt6]}{8+3-2\sqrt{24}-6} = \frac{-2[\sqrt8-\sqrt3-\sqrt6](5+2\sqrt{24})}{(5-2\sqrt{24})(5+2\sqrt{24})} = \frac{-2[\sqrt8-\sqrt3-\sqrt6](5+2\sqrt{24})}{25-96} =$

$= \frac{-2[\sqrt8-\sqrt3-\sqrt6](5+2\sqrt{24})}{-71}$

② (1) $\frac{2,43\cdot10^{-3}\cdot(-4,17\cdot10^{2}+3,27\cdot10^{-2})^3}{6,127\cdot10^3+6,03\cdot10^{-1}} = \frac{2,43\cdot10^{-3}\cdot(-41700\cdot10^{-2}+3,27\cdot10^{-2})^3}{61270\cdot10^{-1}+6,03\cdot10^{-1}} =$

$= \frac{2,43\cdot10^{-3}\cdot(-41696,73\cdot10^{-2})^3}{61276,03\cdot10^{-1}} = \frac{2,43\cdot10^{-3}\cdot(-7,24947\cdot10^{13}\cdot10^{-6})}{61276,03\cdot10^{-1}}$

$= \frac{-1,7616\cdot10^{14}\cdot10^{-3}\cdot10^{-6}}{61276,03\cdot10^{-1}} = -0,00002874859\cdot10^{6} = -2,8748\cdot10$

③ (1) $9,0325874256 \simeq 9,032587$

$E_A = |V_R - Aprox| = 4,256\cdot10^{-7}$

$E_R = \frac{E_A}{V_R} = 4,711\cdot10^{-8}$

④ (1,5) a) $4\sqrt[4]{64} - \frac14\sqrt[4]{5000} + \frac25\sqrt[4]{\frac{216}{16}} = 4\sqrt[4]{2^6} - \frac14\sqrt[4]{2^3\cdot5^4} + \frac25\sqrt[4]{\frac{2^3\cdot3^3}{2^4}} =$

$= 8\sqrt[4]{2^2} - \frac54\sqrt[4]{2^3} + \frac{2}{5\cdot2}\sqrt[4]{2^3\cdot3^3}$

b) $\sqrt[5]{\frac{\sqrt{2^2\cdot3^2\sqrt[4]{2\cdot3^2}\cdot(\sqrt[5]{2^5\cdot3})^3}}{\sqrt[6]{2^2\cdot3\cdot7}}} = \frac{\sqrt[10]{2^2\cdot3^2}\sqrt[40]{2\cdot3^2}\sqrt[50]{2^{15}\cdot3^3}}{\sqrt[30]{2^2\cdot3\cdot7}} =$

$= \sqrt[600]{\frac{2^{120}\cdot3^{120}\,2^{15}\cdot3^{30}\cdot2^{180}\,3^{36}}{2^{40}\cdot3^{20}\cdot7^{20}}} = \sqrt[600]{2^{275}\cdot3^{166}\cdot7^{-20}} =$

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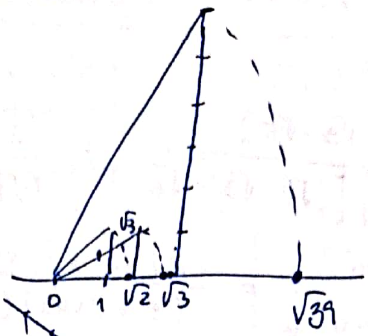
c) $\dfrac{(-16)^3(-48)^4 54^2(-8)^{-2}}{40^4(-24)^2\,15^{-3}} = \dfrac{(-2^4)^3(-2^4.3)^4(2.3^3)^2(-2^3)^{-2}}{(2^3.5)^4(-2^3.3)^2(3.5)^{-3}} =$

$= \dfrac{-2^{12}.2^{16}.3^4.2^2.3^6\,2^{-6}}{2^{12}5^4\,2^6\,3^2\,3^{-3}5^{-3}} = -2^6.3^{11}5^{-1}$

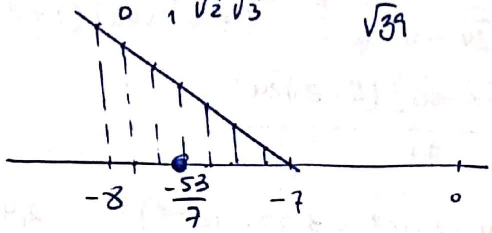
(5) (1) $\sqrt{39} = \sqrt{6^2+\sqrt{3}}$

$\sqrt{3} = \sqrt{1^2+\sqrt{2}}$

$\sqrt{2} = \sqrt{1^2+1^2}$



$-\dfrac{53}{7} = -7\dfrac{4}{7}$



(6) (1)

a) $\log\sqrt[5]{\dfrac{1}{0,32}} = \log\left(\dfrac{1}{0,32}\right)^{1/5} = \dfrac{1}{5}\left[\log 1 - \log 0,32\right] = \dfrac{1}{5}\left[0 - \log\dfrac{32}{100}\right] =$

$= \dfrac{1}{5}\left[-\log 32 + \log 100\right] = \dfrac{1}{5}\left[-\log 2^5 + 2\right] = \dfrac{1}{5}\left[-5\log 2 + 2\right] =$

$= \dfrac{1}{5}\left[-5 \cdot 0,3010 + 2\right] = \dfrac{1}{5}\cdot\left(-\dfrac{99}{200}\right) = -\dfrac{99}{1000}$

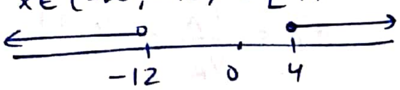
b) $\log\dfrac{405}{8} = \log 3^4.5 - \log 2^3 = 4\log 3 + \log 5 - 3\log 2 =$

$= 4 \cdot 0,4771 + 0,6990 - 3 \cdot 0,3010 = 1,7044$

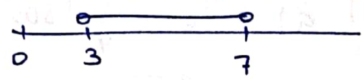
(7) a) $|x+4| \geq 8 \to x+4 \geq 8 \to x \geq 4$

$x+4 < -8 \to x < -12$

$x \in (-\infty, -12) \cup [4, +\infty)$



b) $|x-5| < 2 \to -2 < x-5 < 2 \to 3 < x < 7 \to x \in (3,7)$



(8) $\log A = \log 1000 + \log x^4 - \log\sqrt[6]{y} + \log z^5 - \log\dfrac{z^2}{y^2}$

$\log A = \log 1000 . x^4 . z^5 - \log\dfrac{\sqrt[6]{y}\,z^2}{y^2}$

$A = \dfrac{1000 . x^4 z^5}{\dfrac{\sqrt[6]{y}\,z^2}{y^2}} = \dfrac{1000\,x^4 z^5 y^2}{\sqrt[6]{y}\,z^2}$

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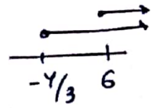
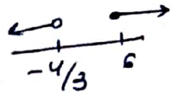
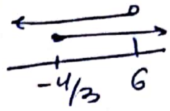
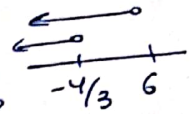
(9) (1) $|x-6|-|3x+4|=\begin{cases} x-6-|3x+4| & \text{si } x-6\geq 0 \\ -x+6-|3x+4| & \text{si } x-6<0 \end{cases} =$

$$\begin{cases} x-6-(3x+4) & \begin{cases}\text{si } x-6\geq 0\\ \text{si } 3x+4\geq 0\end{cases} \\ x-6-(-3x-4) & \begin{cases}\text{si } x-6\geq 0\\ \text{si } 3x+4<0\end{cases} \\ -x+6-(3x+4) & \begin{cases}\text{si } x-6\geq 0\\ \text{si } 3x+4<0\end{cases} \\ -x+6-(-3x-4) & \begin{cases}\text{si } x-6\geq 0\\ \text{si } 3x+4<0\end{cases} \end{cases} = \begin{cases} -2x-10 & \begin{matrix}\text{si } x\geq 6\\ \text{si } x\geq -4/3\end{matrix} \\ 4x-2 & \begin{matrix}\text{si } x\geq 6\\ \text{si } x<-4/3\end{matrix} \\ -4x+2 & \begin{matrix}\text{si } x<6\\ \text{si } x\geq -4/3\end{matrix} \\ 2x+10 & \begin{matrix}\text{si } x<6\\ \text{si } x<-4/3\end{matrix} \end{cases}$$









$$= \begin{cases} -2x-10 & \text{si } x\geq 6 \\ 4x-2 & \nexists \\ -4x+2 & \text{si } -4/3\leq x<6 \\ 2x+10 & \text{si } x<-4/3 \end{cases}$$

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