CONTROL TEMA 1.

1. (1)Racionaliza:

   a. $\frac{6-\sqrt{13}}{\sqrt{11}-\sqrt{7}}$ b. $\frac{-6}{\sqrt{10}-\sqrt{7}+\sqrt{15}}$

2. (1)Calcula y expresa el resultado en notación científica: $\frac{5{,}07\cdot 10^{-4}\cdot\left(6{,}37\cdot 10^{2}-3{,}07\cdot 10^{-2}\right)^{4}}{2{,}97\cdot 10^{3}+5{,}53\cdot 10^{-4}}=$

3. (1)Escribe las aproximaciones a las diezmillonésimas del número, 8,6521598975. Calcula el error absoluto y el error relativo.

4. (1) Calcula y simplifica:

   a. $3\sqrt[3]{384}-\frac{1}{4}\sqrt[4]{6000}+\frac{2}{5}\sqrt[3]{\frac{324}{32}}=$

   b. $\sqrt[6]{\frac{\sqrt{144\,\sqrt[3]{324}\cdot\left(\sqrt[4]{96}\right)^{4}}}{\sqrt[5]{192}}}$

5. (1) Representa en la recta real $\sqrt{73}$, $-\frac{59}{8}$

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

   a. $\log\sqrt[5]{\frac{1}{0{,}256}}$ b. $\log\frac{1620}{192}$

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

   a. $|x+6|\geq 4$ b. $|x+2|<5$

8. (1) Escribe la expresión algebraica de:

   $\log A = 4+4\log x-\frac{3}{7}\log(y)-3\log z-5\log\frac{x}{y}$

9. (1) Calcula $|x+5|-3|3x-2|$

10. (1) Calcula utilizando fracciones generatrices: $2{,}36+6{,}2\hat{3}-7{,}\widehat{52}=$

T1. 1ºA

(1) (1)

a) $\dfrac{6-\sqrt{13}}{\sqrt{11-\sqrt{7}}} = \dfrac{(6-\sqrt{13})\sqrt{11-\sqrt{7}}}{11-\sqrt{7}} = \dfrac{(6-\sqrt{13})\sqrt{11-\sqrt{7}}\,(11+\sqrt{7})}{121-7} = \dfrac{(6-\sqrt{13})\sqrt{11-\sqrt{7}}\,(11+\sqrt{7})}{114}$

b) $\dfrac{-6}{\sqrt{10}-\sqrt{7}+\sqrt{15}} = \dfrac{-6\left[\sqrt{10}-\sqrt{7}-\sqrt{15}\right]}{(\sqrt{10}-\sqrt{7})^2-\sqrt{15}^2} = \dfrac{-6\left[\sqrt{10}-\sqrt{7}-\sqrt{15}\right]}{10+7-2\sqrt{70}-15} = \dfrac{-6\left[\sqrt{10}-\sqrt{7}-\sqrt{15}\right]}{2-2\sqrt{70}} =$

$= \dfrac{-6\left[\sqrt{10}-\sqrt{7}-\sqrt{15}\right](2+2\sqrt{70})}{4-280} = \dfrac{-6(\sqrt{10}-\sqrt{7}-\sqrt{15})(2+2\sqrt{70})}{-276} = \dfrac{(\sqrt{10}-\sqrt{7}-\sqrt{15})(2+2\sqrt{70})}{+46}$

(2) (1)

$\dfrac{5{,}07\cdot10^{-4}(6{,}37\cdot10^{2}-3{,}07\cdot10^{-2})^4}{2{,}97\cdot10^{3}+5{,}53\cdot10^{-4}} = \dfrac{5{,}07\cdot10^{-4}\left[63700\cdot10^{-2}-3{,}07\cdot10^{-2}\right]^4}{29700000\cdot10^{-4}+5{,}53\cdot10^{-4}} =$

$= \dfrac{5{,}07\cdot10^{-4}\,(63696{,}93\cdot10^{-2})^4}{29700005{,}53\cdot10^{-4}} = \dfrac{5{,}07\cdot10^{-4}\cdot1{,}64617\cdot10^{19}\cdot10^{-8}}{2{,}970000553\cdot10^{7}\cdot10^{-4}} =$

$= \dfrac{8{,}346068867\cdot10^{7}}{2{,}970000553\cdot10^{3}} = 2{,}810123674\cdot10^{4}$

(3) $8{,}6521598975 \simeq 8{,}6521599$

$E_A = |8{,}6521598975 - 8{,}6521599| = 2{,}5\cdot10^{-9}$

$E_R = \dfrac{2{,}5\cdot10^{-9}}{8{,}6521598971} = 2{,}889451917\cdot10^{-10}$

(4)

a) $3\sqrt[4]{384} - \frac{1}{4}\sqrt[4]{6000} + \frac{2}{5}\sqrt[3]{\frac{324}{32}} = 3\sqrt[4]{2^7\cdot3} - \frac{1}{4}\sqrt[4]{2^4\cdot3\cdot5^3} + \frac{2}{5}\sqrt[3]{\frac{2^2\cdot3^4}{2^5}} =$

$= 6\sqrt[4]{2^3\cdot3} - \frac{2}{4}\sqrt[4]{3\cdot5^3} + \frac{6}{10}\sqrt[3]{\frac{2^2\cdot3}{2^2}} = 6\sqrt[4]{2^3 3} - \frac{1}{2}\sqrt[4]{3\cdot5^3} + \frac{3}{5}\sqrt[3]{3}$

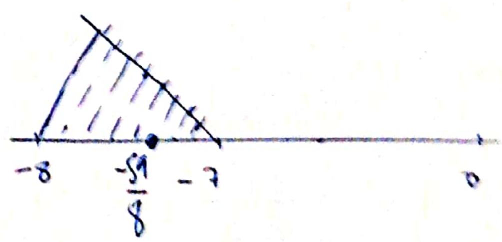
b) $\sqrt[6]{\dfrac{\sqrt{144\sqrt[3]{324}\cdot(\sqrt[3]{96})^4}}{\sqrt[5]{192}}} = \dfrac{\sqrt[12]{2^4\cdot3^2}\ \sqrt[36]{2^2\cdot3^4}\ \left(\sqrt[36]{2^5\cdot3}\right)^4}{\sqrt[30]{2^6\cdot3}} =$

$= \dfrac{\sqrt[12]{2^4\cdot3^2}\ \sqrt[36]{2^2\cdot3^4}\ \sqrt[36]{2^{20}\cdot3^4}}{\sqrt[30]{2^6\cdot3}} = \sqrt[180]{\dfrac{2^{60}3^{30}\ 2^{10}\cdot3^{20}\ 2^{100}\cdot3^{20}}{2^{36}\cdot3^{6}}} =$

$= \sqrt[180]{\dfrac{2^{170}\cdot3^{70}}{2^{36}\cdot3^{6}}} = \sqrt[180]{2^{134}\,3^{64}} = \sqrt[90]{2^{67}\,3^{32}}$

(5) $\sqrt{73} = \sqrt{8^2+3^2}$

$-\dfrac{59}{8} = -7\,\dfrac{3}{8}$



(6) a) $\log \sqrt[5]{\frac{1}{0,256}} = \frac{1}{5} \log \frac{1000}{256} = \frac{1}{5}\left[\log 1000 - \log 2^8\right] = \frac{1}{5}\left[3 - 8 \log 2\right] =$

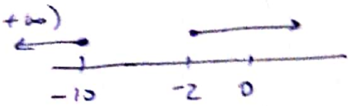
$= \frac{1}{5}\left[3 - 8 \cdot 0,3010\right] = \frac{0,592}{5} = 0,1184$

b) $\log \frac{1620}{192} = \log \frac{2^2\, 3^4 \cdot 5}{2^6 \cdot 3} = \log \frac{3^3 \cdot 5}{2^4} = 3 \log 3 + \log 5 - 4 \log 2 =$

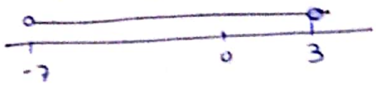
$= 3 \cdot 0,4771 + 0,6990 - 4 \cdot 0,3010 = 0,9263$

(7) a) $|x+6| \geq 4 \rightarrow x \in (-\infty, -10] \cup [-2, +\infty)$

$\rightarrow -4 < x+6 < 4 \rightarrow -10 < x < -2$



b) $|x+2| < 5 \rightarrow -5 < x+2 < 5 \rightarrow -7 < x < 3 \quad x \in (-7, 3)$ Es (-2)



(8) $\log A = 4 + 4 \log x - \frac{3}{7} \log y - 3 \log z - 5 \log \frac{x}{y}$

$\log A = \log 10000 + \log x^4 - \log \sqrt[7]{y^3} - \log z^3 - \log \frac{x^5}{y^5}$

$\log A = \log \frac{10000 \cdot x^4}{\sqrt[7]{y^3}\; z^3 \cdot \frac{x^5}{y^5}} \rightarrow A = \frac{10000 \cdot x^4 y^5}{\sqrt[7]{y^3}\; z^3 \cdot x^5} = \frac{10000\, y^{32/7}}{z^3 x}$

(9) $|x+5| - 3|3x-2| = \begin{cases} x+5 - 3(3x-2) & \text{si } x+5 \geq 0,\ 3x-2 \geq 0 \\ x+5 + 3(3x-2) & \text{si } x+5 \geq 0,\ 3x-2 < 0 \\ -x-5 - 3(3x-2) & \text{si } x+5 < 0,\ 3x-2 \geq 0 \\ -x-5 + 3(3x-2) & \text{si } x+5 < 0,\ 3x-2 < 0 \end{cases} = \begin{cases} -8x + 11 & x \geq -5,\ x \geq 2/3 \rightarrow x \geq 2/3 \\ 10x - 1 & x \geq -5,\ x < 2/3 \rightarrow -5 \leq x < \frac{2}{3} \\ -10x + 1 & x < -5,\ x \geq 2/3 \rightarrow \nexists \\ 8x - 11 & x < -5,\ x < 2/3 \rightarrow x < -5 \end{cases}$

(10) $2,36 + 6,2\overset{\frown}{3} - 7,\overset{\frown}{52} =$

$100N = 236$

$N = \frac{236}{100}$

$100N = 623,33..$
$-10N = 62,33..$
$90N = 561$
$N = \frac{561}{90}$

$100N = 752,52...$
$-N = 7,52...$
$99N = 745$
$N = \frac{745}{99}$

$= \frac{236}{100} + \frac{561}{90} - \frac{745}{99} = \frac{5287}{4950}$