

CONTROL TEMA 1.

1. (1,5)Racionaliza:

a. $\frac{8-\sqrt{12}}{\sqrt{\sqrt{5}-\sqrt{6}}}$

b. $\frac{-7}{\sqrt{13-11+\sqrt{5}}}$

2. (1)Calcula y expresa el resultado en notación científica: $\frac{6,08 \cdot 10^{-5} \cdot (7,38 \cdot 10^3 - 4,17 \cdot 10^{-1})^5}{3,86 \cdot 10^4 + 6,12 \cdot 10^{-2}} =$

3. (1)Escribe las aproximaciones a las cienmillonésimas del número, 7,6492135708975. Calcula el error absoluto y el error relativo.

4. (1,5) Calcula y simplifica:

a. $3\sqrt[5]{768} - \frac{1}{3}\sqrt[5]{9000} + \frac{3}{5}\sqrt[5]{\frac{648}{32}} =$

b. $\sqrt[8]{\frac{\sqrt{288} \sqrt[3]{768} \cdot (\sqrt{192})^5}{\sqrt[6]{384}}}$

5. (1) Representa en la recta real $\sqrt{83}$, $-\frac{61}{7}$

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

a. $\log \sqrt[6]{\frac{1}{0,1536}}$

b. $\log \frac{3240}{576}$

7. (1) Escribe la expresión algebraica de:

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

8. (1) Calcula $|x - 7| - 2|5x + 1|$

9. (1) Calcula utilizando fracciones generatrices: $3,28 + 7,4\widehat{6} - 9,4\widehat{5} =$

$$\textcircled{1} \text{ a) } \frac{8-\sqrt{12}}{\sqrt{5}-\sqrt{6}} = \frac{(8-\sqrt{12})(\sqrt{5}-\sqrt{6})}{(\sqrt{5}-\sqrt{6})^2} = \frac{(8-\sqrt{12})(\sqrt{5}-\sqrt{6})(\sqrt{5}+\sqrt{6})}{(\sqrt{5}-\sqrt{6})(\sqrt{5}+\sqrt{6})} = \frac{(8-\sqrt{12})\sqrt{5}-\sqrt{6}(\sqrt{5}+\sqrt{6})}{5-6} =$$

$$\frac{(8-\sqrt{12})(\sqrt{5}-\sqrt{6})(\sqrt{5}+\sqrt{6})}{-1}$$

$$\text{b) } \frac{-7}{\sqrt{13}-11+\sqrt{5}} = \frac{-7[(\sqrt{13}-11)-\sqrt{5}]}{[\sqrt{13}-11+\sqrt{5}][\sqrt{13}-11-\sqrt{5}]} = \frac{-7[\sqrt{13}-11-\sqrt{5}]}{13-22\sqrt{13}+121-5} = \frac{-7[\sqrt{13}-11-\sqrt{5}](129+22\sqrt{13})}{(129-22\sqrt{13})(129+22\sqrt{13})}$$

$$= \frac{-7[\sqrt{13}-11-\sqrt{5}](129+22\sqrt{13})}{10349}$$

$$\textcircled{2} \frac{6,08 \cdot 10^{-5} (7,38 \cdot 10^3 - 4,17 \cdot 10^{-1})^5}{3,86 \cdot 10^4 + 6,12 \cdot 10^2} = \frac{6,08 \cdot 10^{-5} [73800 \cdot 10^{-1} - 4,17 \cdot 10^{-1}]^5}{3860000 \cdot 10^{-2} + 6,12 \cdot 10^{-2}}$$

$$= \frac{6,08 \cdot 10^{-5} (73795,83 \cdot 10^{-1})^5}{3,8600006,12 \cdot 10^{-2}} = \frac{6,08 \cdot 10^{-5} \cdot 2,188563282 \cdot 10^{24} \cdot 10^{-5}}{3,860000612 \cdot 10^6 \cdot 10^{-2}}$$

$$= \frac{13,30646475 \cdot 10^{14}}{3,860000612 \cdot 10^4} = 3,447265196 \cdot 10^{10}$$

$$\textcircled{3} 7,6492135708975 \approx 7,64921357$$

$$E_A = |7,6492135708975 - 7,64921357| = 8,975 \cdot 10^{-10}$$

$$E_R = \frac{8,975 \cdot 10^{-10}}{7,6492135708975} \approx 1,173323233 \cdot 10^{-10}$$

$$\textcircled{4} \text{ a) } 3\sqrt[5]{768} - \frac{1}{3}\sqrt[5]{9000} + \frac{3}{5}\sqrt[5]{\frac{648}{32}} = 3\sqrt[5]{2^8 \cdot 3} - \frac{1}{3}\sqrt[5]{2^3 \cdot 5^2 \cdot 5^3} + \frac{3}{5}\sqrt[5]{\frac{2^3 \cdot 3^4}{2^5}} =$$

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

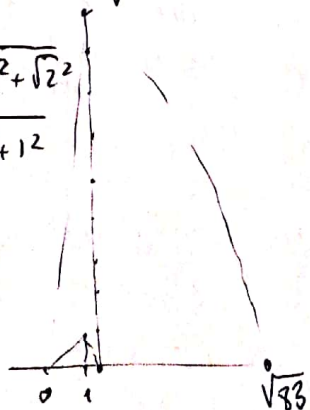
$$\text{b) } \frac{\sqrt[8]{\sqrt{288^3 \sqrt{768} (\sqrt{192})^5}}}{\sqrt[6]{384}} = \frac{\sqrt[8]{\sqrt{2^5 \cdot 3^2 \sqrt{2^8 \cdot 3} (\sqrt{2^6 \cdot 3})^5}}}{\sqrt[6]{2^7 \cdot 3}} = \frac{\sqrt[8]{\sqrt{2^5 \cdot 3^2 \sqrt{2^8 \cdot 3} \sqrt{2^{30} \cdot 3^5}}}}{\sqrt[6]{2^7 \cdot 3}}$$

$$= \frac{\sqrt[16]{2^5 \cdot 3^2} \cdot \sqrt[48]{2^8 \cdot 3} \cdot \sqrt[32]{2^{30} \cdot 3^5}}{\sqrt[48]{2^7 \cdot 3}} = \sqrt[96]{\frac{2^{31} \cdot 3^{12} \cdot 2^{16} \cdot 3^2 \cdot 2^{90} \cdot 3^{15}}{2^{14} \cdot 3^2}} = \sqrt[96]{\frac{2^{136} \cdot 3^{29}}{2^{14} \cdot 3^2}} = \sqrt[96]{2^{122} \cdot 3}$$

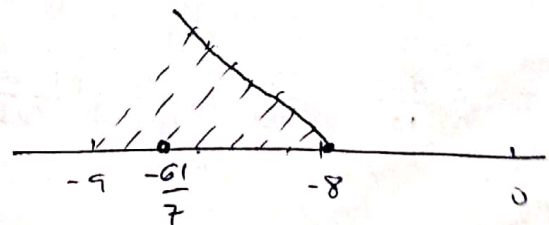
$$= 2 \cdot \sqrt[96]{2^{26} \cdot 3^{27}}$$

$$\textcircled{5} \sqrt{83} = \sqrt{9^2 + 12^2}$$

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



$$-\frac{61}{7} = -8 \frac{5}{7}$$



$$\begin{aligned} \textcircled{6} \text{ a) } \log \sqrt[6]{\frac{1}{0,1536}} &= \log \left(\frac{10000}{1536} \right)^{1/6} = \frac{1}{6} \log \frac{2^4 \cdot 5^4}{2^9 \cdot 3} = \frac{1}{6} [\log 2^4 - \log 3 + \log 2^4 + \log 5^4] \\ &= \frac{1}{6} [4 \cdot \log 2 - \log 3 + 4 \log 2 + 4 \log 5] = \frac{1}{6} [8 \log 2 - \log 3 + 4 \log 5] \\ &= \frac{1}{6} [8 \cdot 0,3010 - 0,4771 + 4 \cdot 0,6990] = 0,13565 \end{aligned}$$

$$\begin{aligned} \text{b) } \log \frac{3240}{576} &= \log \frac{2^3 \cdot 3^4 \cdot 5}{2^6 \cdot 3^2} = \log \frac{3^2 \cdot 5}{2^3} = \log 3^2 + \log 5 - \log 2^3 \\ &= 2 \cdot \log 3 + \log 5 - 3 \log 2 = 0,7502 \end{aligned}$$

$$\begin{aligned} \textcircled{7} \log A &= 5 + 3 \log x - \frac{2}{5} \log y - 4 \log z + 5 \log \frac{z}{y} \\ \log A &= \log 100000 + \log x^3 - \log \sqrt[5]{y^2} - \log z^4 + \log \frac{z^5}{y^5} \\ \log A &= \log \frac{100000 \cdot x^3 \cdot \frac{z^5}{y^5}}{\sqrt[5]{y^2} \cdot z^4} \Rightarrow A = \frac{100000 \cdot x^3 \cdot z}{\sqrt[5]{y^{27}}} \end{aligned}$$

$$\textcircled{8} |x-7| - 2|5x+1| = \begin{cases} (x-7) - 2(5x+1) & \text{si } x-7 \geq 0 \\ & 5x+1 \geq 0 \\ -(x-7) - 2(5x+1) & \text{si } x-7 < 0 \\ & 5x+1 \geq 0 \\ (x-7) - 2[-(5x+1)] & \text{si } x-7 \geq 0 \\ & 5x+1 < 0 \\ -(x-7) - 2[-(5x+1)] & \text{si } x-7 < 0 \\ & 5x+1 < 0 \end{cases} = \begin{cases} -9x-9 & \text{si } x \geq 7 \\ -11x+5 & -\frac{1}{5} \leq x < 7 \\ 11x-5 & \cancel{x} \\ 9x+9 & x < -\frac{1}{5} \end{cases}$$

$$\begin{aligned} \textcircled{9} 3,28 \rightarrow N = 3,28 &\Rightarrow 100N = 328 \Rightarrow N = \frac{328}{100} \\ 7,46 \rightarrow 100N = 746,66 & \dots \\ -10N = 74,66 & \dots \\ \hline 90N = 672 & \\ N = \frac{672}{90} & \\ 9,45 \rightarrow 100N = 945,45 & \dots \\ -N = 9,45 & \dots \\ \hline 99N = 936 & \\ N = \frac{936}{99} & \\ 3,28 + 7,46 - 9,45 &= \frac{328}{100} + \frac{672}{90} - \frac{936}{99} = \frac{1066}{825} \end{aligned}$$