

1. (1,5)Racionaliza:

a. $\frac{5+\sqrt{3}}{\sqrt{7+\sqrt{2}}}$

b. $\frac{-5}{\sqrt{6}-\sqrt{5+\sqrt{7}}}$

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

$$\frac{2,53 \cdot 10^{-2} \cdot (5,97 \cdot 10^3 - 2,87 \cdot 10^{-1})^3}{8,107 \cdot 10^2 + 9,53 \cdot 10^{-2}} =$$

3. (1)Escribe las aproximaciones a las millonésimas del número 6,5278450298. Calcula el error absoluto y el error relativo.

4. (1,5) Calcula y simplifica:

a. $3^3\sqrt{32} - \frac{1}{3}\sqrt[3]{500} + \frac{2}{5}\sqrt[3]{\frac{108}{8}} =$

b. $\sqrt[4]{\frac{\sqrt{24^2\sqrt{48}(\sqrt[3]{48})^2}}{\sqrt[6]{384}}}$

c. $\frac{(-8)^4(-24)^5 18^3(-4)^{-3}}{20^4(-54)^4 5^{-3}}$

5. (1) Representa en la recta real $\sqrt{38}$, $-\frac{47}{6}$

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

a. $\log \sqrt[6]{\frac{1}{0,64}}$

b. $\log \frac{810}{16}$

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

a. $|x - 5| \geq 3$

b. $|x + 7| < 6$

8. (1) Escribe la expresión algebraica de:

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

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

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$$\textcircled{1} (1,5) \text{ a) } \frac{5+\sqrt{3}}{\sqrt{7+\sqrt{2}}} = \frac{(5+\sqrt{3})\sqrt{7+\sqrt{2}}}{(\sqrt{7+\sqrt{2}})^2} = \frac{(5+\sqrt{3})\sqrt{7+\sqrt{2}}(7-\sqrt{2})}{(7+\sqrt{2})(7-\sqrt{2})} = \frac{(5+\sqrt{3})\sqrt{7+\sqrt{2}}(7-\sqrt{2})}{49-2}$$

$$= \frac{(5+\sqrt{3})\sqrt{7+\sqrt{2}}(7-\sqrt{2})}{47}$$

$$\text{b) } \frac{-5}{\sqrt{6}-\sqrt{5}+\sqrt{7}} = \frac{-5[(\sqrt{6}-\sqrt{5})-\sqrt{7}]}{[(\sqrt{6}-\sqrt{5})+\sqrt{7}][(\sqrt{6}-\sqrt{5})-\sqrt{7}]} = \frac{-5[\sqrt{6}-\sqrt{5}-\sqrt{7}]}{6+5-2\sqrt{30}-7}$$

$$= \frac{-5[\sqrt{6}-\sqrt{5}-\sqrt{7}](4+2\sqrt{30})}{(4-2\sqrt{30})(4+2\sqrt{30})} = \frac{-5[\sqrt{6}-\sqrt{5}-\sqrt{7}](4+2\sqrt{30})}{16-120}$$

$$= \frac{-5[\sqrt{6}-\sqrt{5}-\sqrt{7}](4+2\sqrt{30})}{-104}$$

$$\textcircled{2} (1) \frac{2,53 \cdot 10^{-2} \cdot (5,97 \cdot 10^3 - 2,87 \cdot 10^{-1})^3}{8,107 \cdot 10^2 + 9,53 \cdot 10^{-2}} = \frac{2,53 \cdot 10^{-2} \cdot (59700 \cdot 10^{-1} - 2,87 \cdot 10^{-1})^3}{81070 \cdot 10^{-2} + 9,53 \cdot 10^{-2}}$$

$$= \frac{2,53 \cdot 10^{-2} \cdot (59697,13 \cdot 10^{-1})^3}{(81079,53 \cdot 10^{-2})} = \frac{2,53 \cdot 10^{-2} \cdot 2,1275 \cdot 10^{14} \cdot 10^{-3}}{8,107953 \cdot 10^2}$$

$$= \frac{5,382575 \cdot 10^9}{8,107953 \cdot 10^2} = 0,6639 \cdot 10^7 = 6,639 \cdot 10^6$$

$$\textcircled{3} (1) N = 6,5278450298$$

$$\text{Aprox} = 6,527845$$

$$E_A = |N - \text{Aprox}| = 2,98 \cdot 10^{-8}$$

$$E_R = \frac{E_A}{N} = 4,565 \cdot 10^{-9}$$

$$\textcircled{4} (1,5) \text{ a) } 3\sqrt[3]{32} - \frac{1}{3}\sqrt[3]{500} + \frac{2}{5}\sqrt[3]{\frac{108}{8}} = 3\sqrt[3]{2^5} - \frac{1}{3}\sqrt[3]{2^2 \cdot 5^3} + \frac{2}{5}\sqrt[3]{\frac{2^2 \cdot 3^3}{2^3}}$$

$$= 6\sqrt[3]{2^2} - \frac{5}{3}\sqrt[3]{2^2} + \frac{2}{5} \cdot \frac{3}{2}\sqrt[3]{2^2} - \frac{74}{15}\sqrt[3]{2^2}$$

$$\text{b) } \sqrt[4]{\frac{\sqrt{24} \sqrt[5]{48} (\sqrt[3]{48})^2}{\sqrt[6]{384}}} = \sqrt[4]{\frac{2^3 \cdot 3 \sqrt[5]{2^4 \cdot 3} \sqrt[3]{2^8 \cdot 3^2}}{\sqrt[6]{2^7 \cdot 3}}}$$

$$= \frac{\sqrt[8]{2^3 \cdot 3} \sqrt[40]{2^4 \cdot 3} \sqrt[24]{2^8 \cdot 3^2}}{\sqrt[24]{2^7 \cdot 3}} = \sqrt[120]{\frac{2^{45} \cdot 3^{15} \cdot 2^{12} \cdot 3^3 \cdot 2^{40} \cdot 3^{10}}{2^{35} \cdot 3^5}}$$

$$= \sqrt[120]{2^{62} \cdot 3^{23}}$$

$$c) \frac{(-8)^4 (-24)^5 18^3 (-4)^{-3}}{20^4 (-54)^4 \cdot 5^{-3}} = \frac{(-2^3)^4 \cdot (-2^3 \cdot 3)^5 \cdot (2 \cdot 3^2)^3 (-2^2)^{-3}}{(2^2 \cdot 5)^4 (-3^3 \cdot 2)^4 \cdot 5^{-3}} =$$

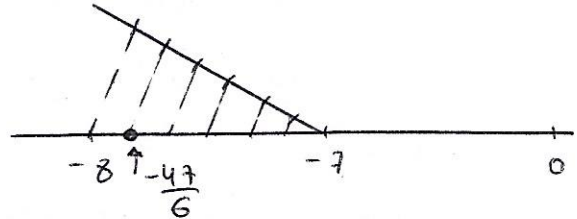
$$= \frac{2^{12} (-2^{15} \cdot 3^5) \cdot 2^3 \cdot 3^6 \cdot (-2^{-6})}{2^8 \cdot 5^4 \cdot 3^{12} \cdot 2^4 \cdot 5^{-3}} = \frac{2^{24} \cdot 3^{11}}{2^{20} \cdot 3^{12} \cdot 5} = 2^4 \cdot 3^{-1} \cdot 5^{-1}$$

$$\textcircled{5} (1) \sqrt{38} = \sqrt{6^2 + (\sqrt{2})^2}$$

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



$$-\frac{47}{6} = -7 \cdot \frac{5}{6}$$



$$\textcircled{6} (1) \log 2 = 0,3010 ; \log 3 = 0,4771 ; \log 5 = 0,6990$$

$$a) \log \sqrt[6]{\frac{1}{0,64}} = \log \left(\frac{1}{0,64} \right)^{1/6} = \frac{1}{6} \log \frac{1}{0,64} = \frac{1}{6} [\log 1 - \log 0,64] =$$

$$= \frac{1}{6} [0 - \log \frac{64}{100}] = \frac{1}{6} [-(\log 64 - \log 100)] =$$

$$= \frac{1}{6} [-\log 2^6 + 2] = \frac{1}{6} [-6 \log 2 + 2] = \frac{1}{6} [-6 \cdot 0,3010 + 2] =$$

$$= 0,0323$$

$$b) \log \frac{810}{16} = \log 810 - \log 16 = \log 3^4 \cdot 10 - \log 2^4 =$$

$$= 4 \cdot \log 3 + \log 10 - 4 \log 2 = 1,7044$$

$$\textcircled{7} (1) a) |x-5| \geq 3 \Rightarrow x \in (-\infty, 2] \cup [8, +\infty)$$

$$\downarrow$$

$$|x-5| < 3 \rightarrow E(5, 3) \Rightarrow x \in (2, 8)$$

$$b) |x+7| < 6 \rightarrow E(-7, 6) \rightarrow x \in (-13, -1)$$



$$\textcircled{8} (1) \log A = 2 + 2 \log x - \frac{1}{5} \log y + 3 \log z - 4 \log \frac{z}{y}$$

$$\log A = \log 100 + \log x^2 - \log \sqrt[5]{y} + \log z^3 - \log \left(\frac{z}{y} \right)^4$$

$$\log A = \log (100 \cdot x^2 \cdot z^3) - \log \sqrt[5]{y} \cdot \left(\frac{z}{y} \right)^4$$

$$\log A = \log \frac{100 x^2 z^3}{\sqrt[5]{y} \cdot \left(\frac{z}{y} \right)^4} \Rightarrow A = \frac{100 x^2 z^3}{\sqrt[5]{y} \left(\frac{z}{y} \right)^4}$$

$$\textcircled{9} (1) \quad |x-7| - |2x+5| = \begin{cases} x-7 - |2x+5| & \text{si } x-7 \geq 0 \rightarrow x \geq 7 \\ -x+7 - |2x+5| & \text{si } x-7 < 0 \rightarrow x < 7 \end{cases} =$$

$$= \begin{cases} x-7 - (2x+5) & \text{si } x \geq 7 \\ & \text{si } 2x+5 \geq 0 \\ x-7 - (-2x-5) & \text{si } x \geq 7 \\ & \text{si } 2x+5 < 0 \\ -x+7 - (2x+5) & \text{si } x < 7 \\ & \text{si } 2x+5 \geq 0 \\ -x+7 - (-2x-5) & \text{si } x < 7 \\ & \text{si } 2x+5 < 0 \end{cases} = \begin{cases} -x-12 & \text{si } x \geq 7 \\ & x \geq -5/2 \\ 3x-2 & \text{si } x \geq 7 \\ & x < -5/2 \\ -3x+2 & \text{si } x < 7 \\ & x \geq -5/2 \\ x+12 & \text{si } x < 7 \\ & x < -5/2 \end{cases} =$$

$$= \begin{cases} -x-12 & \text{si } x \geq 7 \\ 3x-2 & \cancel{\text{si}} \\ -3x+2 & \text{si } -5/2 \leq x < 7 \\ x+12 & \text{si } x < -5/2 \end{cases}$$