CONTROL TEMA 1. NOMBRE:

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

   b. $\sqrt[4]{\frac{\sqrt{24\sqrt[5]{48}\cdot\left(\sqrt[3]{48}\right)^{2}}}{\sqrt[6]{384}}}$

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

5. (1) Represența 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 $|x-7|-|2x+5|$

TEMA 1. 1° BACHILLERATO A

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

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

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

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

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

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

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

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

③ (1) $N = 6{,}5278450298$

Aprox $= 6{,}527845$

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

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

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

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

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

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

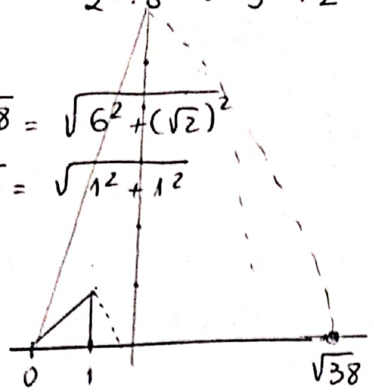
$= \sqrt[120]{2^{62}\cdot 3^{23}}$

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

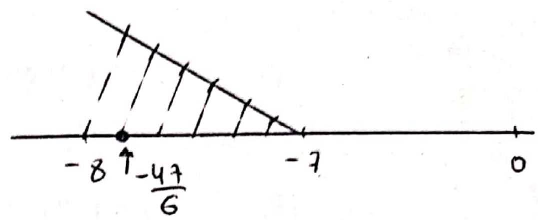
$= \dfrac{2^{12}(-2^{15}\cdot 3^5)\cdot 2^3\cdot 3^6\cdot(-2^{-6})}{2^8\cdot 5^4\cdot 3^{12}\cdot 2^4\cdot 5^{-3}} = \dfrac{2^{24}\cdot 3^{11}}{2^{12}\cdot 3^{12}\cdot 5} = 2^{12}\cdot 3^{-1}\cdot 5^{-1}$

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

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



$-\dfrac{47}{6} = -7.\dfrac{5}{6}$



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

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

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

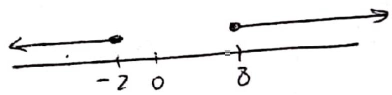
$= \dfrac{1}{6}\left[-\log 2^6 + 2\right] = \dfrac{1}{6}\left[-6\log 2 + 2\right] = \dfrac{1}{6}\left[-6\cdot 0{,}3010 + 2\right] =$

$= 0{,}0323$

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

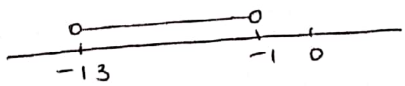
$= 4\cdot\log 3 + \log 10 - 4\log 2 = 1{,}7044$

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



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

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



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

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

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

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

⑨ (1)

$$|x-7|-|2x+5| = \begin{cases} x-7-|2x+5| & \text{si } x-7 \geq 0 \to x \geq 7 \\ -x+7-|2x+5| & \text{si } x-7 < 0 \to x < 7 \end{cases} =$$

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

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