Calcul algebric

$x \neq 0$

- $(21x^3 - 14x^2 + 7x) : (-7x) - (x-1) \cdot (x+2) =$

$$= \frac{\overset{1}{\cancel{7x}}(3x^2 - 2x + 1)}{-\underset{1}{\cancel{7x}}} - (x^2 + 2x - x - 2) =$$

$$= -3x^2 + 2x - 1 - (x^2 + x - 2) = -3x^2 + 2x - 1 - x^2 - x + 2 =$$

$$= \underline{-4x^2 + x + 1} \; \}$$

- $(x-2) \cdot [4(x+5) - 3(x+6)] - x \cdot (x-4) =$

$$= (x-2) \cdot (4x + 20 - 3x - 18) - x^2 + 4x =$$

$$= (x-2) \cdot (x+2) - x^2 + 4x = \cancel{x^2} - 4 - \cancel{x^2} + 4x = 4x - 4$$

- $2 \cdot \left(\dfrac{\sqrt{7}}{\sqrt{7}-\sqrt{5}} \cdot x \cdot \dfrac{\sqrt{5}}{\sqrt{7}-\sqrt{5}} \cdot x \right) + \left[(2x-9)^9 \right]^4 : \left[(9-2x)^7 \right]^5 =$

cu condiția $9 - 2x \neq 0 \iff 9 \neq 2x \iff x \neq 9/2$

$$= \frac{2 \cdot \sqrt{35} \cdot x^2}{(\sqrt{7}-\sqrt{5})^2} + (2x-9)^{36} : (9-2x)^{35} =$$

$$= \frac{2\sqrt{35}x^2}{(\sqrt{7})^2 - 2 \cdot \sqrt{7} \cdot \sqrt{5} + (\sqrt{5})^2} + (2x-9)^{36} : \left[-1 \cdot (-9 + 2x) \right]^{35} =$$

$$= \frac{2\sqrt{35}x^2}{12 - 2\sqrt{35}} + (2x-9)^{36} : \left[-(2x-9)^{35} \right] =$$

$$= \frac{\cancel{2}\sqrt{35} \cdot x^2}{\cancel{2} \cdot (6 - \sqrt{35})} - (2x-9)^{36-35} =$$

$6+\sqrt{35}$

$$= \frac{\sqrt{35}\,x^2}{6-\sqrt{35}} - 2x + 9 = \frac{6\sqrt{35}\,x^2 + 35x^2}{6^2 - (\sqrt{35})^2} - 2x + 9 =$$

$$= \frac{(6\sqrt{35} + 35)x^2}{36 - 35} - 2x + 9 = (6\sqrt{35} + 35)x^2 - 2x + 9$$

$7+\sqrt{3}$

$$\frac{1}{7-\sqrt{3}} \cdot x^2 + 3 \cdot \left[\frac{\overset{7+\sqrt{3}}{1}}{7-\sqrt{3}} \cdot x^2 + 3 \cdot (1-x) \right] - 3x =$$

$$= \frac{7+\sqrt{3}}{49-3} \cdot x^2 + 3 \cdot \left(\frac{7+\sqrt{3}}{49-3} \cdot x^2 + 3 - 3x \right) - 3x =$$

$$= \frac{(7+\sqrt{3})}{46} \cdot x^2 + 3 \cdot \frac{(7+\sqrt{3})x^2}{46} + 9 - 9x - 3x =$$

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$$= 4 \cdot \frac{(7+\sqrt{3})}{\underset{23}{46}} \cdot x^2 - 12x + 9 = \frac{14 + 7\sqrt{3}}{23} \cdot x^2 - 12x + 9$$

$$\left[(3y-x)^{m+3} - (3y-x)^{m+2} \right] : (3y-x)^{m+2} - (3y-x-1) =$$

(cu condiția $3y - x \neq 0 \Leftrightarrow 3y \neq x \Leftrightarrow y \neq \frac{x}{3}$)

$$= \frac{(3y-x)^1 \cdot (3y-x)^{m+2} - (3y-x)^{m+2} \cdot 1}{(3y-x)^{m+2}} - 3y + x + 1 =$$

$$= \frac{(3y-x)^{m+2} \cdot (3y-x-1)}{(3y-x)^{m+2}} - 3y + x + 1 =$$

1

$$= 3y - x - 1 - 3y + x + 1 = 0$$

$$(4a - 2b + 5)^{133} + (-4a + 2b - 5)^{133} =$$

$$= (4a - 2b + 5)^{133} + \left[(-1) \cdot (4a - 2b + 5) \right]^{133} =$$

$$= (4a - 2b + 5)^{133} + (-1) \cdot (4a - 2b + 5)^{133} =$$

$$= (4a - 2b + 5)^{133} - (4a - 2b + 5)^{133} = 0 \quad \}$$

$$(3x + 7)^2 - (4x - 5)^2 - (7x + 2) \cdot (7x - 2) =$$

$$= (3x)^2 + 2 \cdot 3x \cdot 7 + 7^2 - (16x^2 - 40x + 25) - (49x^2 - 4) =$$

$$= 9x^2 + 42x + 49 - 16x^2 + 40x - 25 - 49x^2 + 4 =$$

$$= -56x^2 + 82x + 28 \quad \Big\{ \quad (x + y + z)^2 = x^2 + y^2 + z^2 + 2xy + 2xz + 2yz$$

$$x^2 + y^2 + z^2 = 216 \quad \Big\} \Rightarrow \quad x + y + z = ?$$
$$xy + yz + zx = 230$$

$$xy + yz + zx = 230 \mid \cdot 2$$
$$2xy + 2yz + 2xz = 460$$
$$x^2 + y^2 + z^2 = 216 \quad \Big| +$$

$$\begin{array}{r|l} \sqrt{676} & 26 \\ \hline 4 & 46 \cdot 6 = 276 \\ 276 & \\ 276 & \\ \hline \end{array}$$

$$x^2 + y^2 + z^2 + 2xy + 2yz + 2xz = 676 \Rightarrow$$

$$(x + y + z)^2 = 676 \Rightarrow \sqrt{(x + y + z)^2} = \sqrt{676} \Leftrightarrow$$

$$|x + y + z| = 26 \Rightarrow x + y + z = 26 \text{ sau}$$
$$x + y + z = -26$$