D CSOPORT:

① a) 68. OLDAL  b) 69. OLDAL

c) HA $f(a)=f(b)$, AKKOR LAGRANGE MIATT VAN OLYAN $x_0 \in (a,b)$, HOGY $f'(x_0)=\frac{f(b)-f(a)}{b-a}=0$

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② $\frac{n-\sqrt{5n}}{n+1} = \frac{n+1}{n+1} + \left(-\frac{\sqrt{5n}+1}{n+1}\right) = 1+a_n$

$b_n = \sqrt{3n}-1$  $\lim_{n\to\infty} a_n \cdot b_n = -\lim_{n\to\infty} \frac{\sqrt{5n}+1}{n+1}\cdot(\sqrt{3n}-1) =$

$= -\sqrt{15}$

JOLLY-JOKER (LÁSD 29. OLD):

$\lim_{n\to\infty} (1+a_n)^{b_n} = \exp(-\sqrt{15}) = e^{-\sqrt{15}}$

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③ a) $\frac{(x\cdot\ln(2x))'\cdot(3x+1)\cdot\cos(x) - (x\cdot\ln(2x))\cdot((3x+1)\cdot\cos(x))'}{((3x+1)\cdot\cos(x))^2} =$

$= \frac{\left(1\cdot\ln(2x)+x\cdot\frac{2}{2x}\right)\cdot(3x+1)\cdot\cos(x) - x\cdot\ln(2x)\cdot(3\cdot\cos(x)+(3x+1)\cdot\sin(x))}{(3x+1)^2\cdot\cos^2(x)}$

(3) b) $f(x) = \sin(x)^{\operatorname{ch}(x)} = \exp\left(\operatorname{ch}(x) \cdot \ln(\sin(x))\right)$

$f'(x) = \exp'\left(\operatorname{ch}(x) \cdot \ln(\sin(x))\right) \cdot \left(\operatorname{ch}(x) \cdot \ln(\sin(x))\right)' =$

$= \sin(x)^{\operatorname{ch}(x)} \cdot \left(\operatorname{ch}(x) \cdot \ln(\sin(x)) + \operatorname{sh}(x) \cdot \frac{\cos(x)}{\sin(x)}\right)$

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(4) $\lim_{x \to 0-} f(x) = \sin(2 \cdot 0) + B \cdot \operatorname{ch}(0) = B$

$\lim_{x \to 0+} f(x) =$ LA'SD B CSOPORT MEGO. $= -\frac{1}{3}$

TEHA'T $\boxed{B = -\frac{1}{3}}$, AMÚGY $f$ FOLYT.

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(5) $f'(x) = 6x + 3x^2 = 3x \cdot (2 + x)$

KRITIKUS PONTOK: $f'(x) = 0 \iff \boxed{x = -2} \quad \boxed{x = 0}$

$f(-3) = 3 \cdot (-3)^2 + (-3)^3 = 27 - 27 = 0 \leftarrow$

$f(-2) = 3 \cdot (-2)^2 + (-2)^3 = 12 - 8 = 4$

$f(0) = 0 \leftarrow$ GLOB. MIN

$f(3) = 3 \cdot 3^2 + 3^3 = 54 \leftarrow$ GLOB. MAX