Задача 1.3(Решение)

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$$\lim\_{x\to 0}\frac{\sqrt[5]{cos7x}-\sqrt[5]{cos6x}}{ln^{2}\left(2^{sin2x}\right)}=$$

$$=\lim\_{x\to 0}\frac{\left(cos6x\right)^{\frac{1}{5}}∙\left(\left(\frac{cos7x}{cos6x}\right)^{\frac{1}{5}}-1\right)}{ln^{2}\left(1+(2^{sin2x}-1)\right)}=$$

$$=\lim\_{x\to 0}\frac{\left(cos6x\right)^{\frac{1}{5}}∙\left(\left(1+\left(\frac{cos7x}{cos6x}-1\right)\right)^{\frac{1}{5}}-1\right)}{\left(2^{sin2x}-1\right)^{2}}=$$

$$=\lim\_{x\to 0}\frac{\left(cos6x\right)^{\frac{1}{5}}∙\left(\frac{cos7x}{cos6x}-1\right)∙\frac{1}{5}}{\left(2^{sin2x}-1\right)^{2}}=$$

$$=\lim\_{x\to 0}\frac{\left(cos6x\right)^{\frac{1}{5}}∙\left(cos7x-cos6x\right)∙\frac{1}{5}}{ln^{2}2∙\left(sin2x\right)^{2}∙cos6x}=$$

$$=\lim\_{x\to 0}\frac{-2∙sin\frac{13x}{2}∙sin\frac{x}{2}∙\frac{1}{5}}{ln^{2}2∙\left(2x\right)^{2}∙\left(cos6x\right)^{\frac{4}{5}}}=$$

$$=\frac{-2∙\frac{13}{2}∙\frac{1}{2}∙\frac{1}{5}}{ln^{2}2∙4}=\frac{-13}{ln^{2}2∙40}$$

Ответ:$ \frac{-13}{ln^{2}2∙40}$