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$$\lim_{x\to 0}\left(\frac{1+\operatorname{sen}x}{5^x+4^x-3^x-2^x}\right)^{\sqrt{1+\operatorname{arctg}x}-1} =$$

$$\left(\sqrt{1+\operatorname{arctg}x}-1\right)\log\frac{1+\operatorname{sen}x}{5^x+4^x-3^x-2^x}$$

$$= \lim_{x\to 0} e^{\left(\sqrt{1+\operatorname{arctg}x}-1\right)\frac{1+\operatorname{sen}x}{5^x+4^x-3^x-2^x}\log\frac{\frac{1+\operatorname{sen}x}{5^x+4^x-3^x-2^x}}{\frac{1+\operatorname{sen}x}{5^x+4^x-3^x-2^x}}} =$$

$$= \lim_{x\to 0} e^{\frac{\sqrt{1+\operatorname{arctg}x}-1}{\operatorname{arctg}x}\cdot\frac{\operatorname{arctg}x}{x}\cdot\frac{1+\operatorname{sen}x}{\frac{5^x-1}{x}+\frac{4^x-1}{x}-\frac{3^x-1}{x}-\frac{2^x-1}{x}}\log\frac{\frac{1+\operatorname{sen}x}{5^x+4^x-3^x-2^x}}{\frac{1+\operatorname{sen}x}{5^x+4^x-3^x-2^x}}} =$$

$$= \lim_{x\to 0} e^{\frac{1}{2}\cdot 1\cdot\frac{1+0}{\log 5+\log 4-\log 3-\log 2}\cdot 0} = e^0 = 1$$