The greatest integer value of x
Find the greatest integer solution of the equation
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$$\lim_{n\to\infty}\frac{n^x-(n-1)^x}{(n+1)^{x-1}+(n+2)^{x-1}}=2018.$$

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I want to note that answer remains the same if in formulation of the problem remove word "integer" and herewith calculation of this limit for any real $x>0$ becomes more meaningful problem.Namely, since

$$\frac{n^x-(n-1)^x}{(n+1)^{x-1}+(n+2)^{x-1}}=\frac{(n-1)^x}{(n+1)^x}\frac{(n+1)x\ln\left(\frac{n}{n-1}\right)}{1+\left(1+\frac{1}{n+1}\right)^{x-1}}\cdot\frac{e^{x\ln\left(\frac{n}{n-1}\right)}-1}{x\ln\left(\frac{n}{n-1}\right)}$$

and $\lim\limits_{n\to\infty}\dfrac{e^{x\ln\left(\frac{n}{n-1}\right)}-1}{x\ln\left(\frac{n}{n-1}\right)}=1$, $\lim\limits_{n\to\infty}\left(1+\left(1+\dfrac{1}{n+1}\right)^{x-1}\right)=2$, $\lim\limits_{n\to\infty}\dfrac{(n-1)^x}{(n+1)^x}=1$,
$\lim\limits_{n\to\infty}(n+1)x\ln\left(\dfrac{n}{n-1}\right)=x\ln\left(\lim\limits_{n\to\infty}\left(1+\dfrac{1}{n-1}\right)^{n+1}\right)=x$ then
$\lim\limits_{n\to\infty}\dfrac{n^x-(n-1)^x}{(n+1)^{x-1}+(n+2)^{x-1}}=\dfrac{x}{2}$ and, therefore, $x=4036$.