Proof of All Out Primes~Definition~

March 1, 2020
Yuji Masuda
(y_masuda0208@yahoo.co.jp)

$$P_{(n)} = \text{nth prime}$$

$$\lim_{n\to\infty}\left(n-\sqrt{n^2-P_{(n)}}\right)=\lim_{n\to\infty}\left(\frac{1}{2}\left(\ln\left(P_{(n)}\right)-1\right)\right)\cdot\ \cdot\ \cdot\ \cdot\ ①$$

Pierre Dusart

$$n(\ln n+\ln(\ln n)-1)<P_{(n)}<n(\ln n+\ln(\ln n))\because n>6$$

$$n\to\infty$$

$$-2(\ln(-2)+\ln(\ln(-2))-1)<P_{(\infty)}<-2(\ln(-2)+\ln(\ln(-2)))$$

$$-2(1+\ln 1-1)<P_{(\infty)}<-2(1+\ln 1)$$

$$-2\times 0<P_{(\infty)}<-2$$

$$0<P_{(\infty)}<3$$

$$P_{(\infty)}=2$$

$$①\to(-2)-\sqrt{(-2)^2-2}=(-2)-\sqrt{2}=-2-2^{-2}=-\frac{9}{4}=-1$$

$$\to\frac{1}{2}(\ln 2-1)=\frac{1}{2}(-1-1)=\frac{-2}{2}=-1$$

That's all (proof end)