

## A new look on the truncated pentagonal number theorem

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### ABSTRACT.

Two new infinite families of inequalities are given in this paper for the partition function  $p(n)$ , using the truncated pentagonal number theorem.

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### REFERENCES

- [1] Andrews, G. E., *The Theory of Partitions*, Addison-Wesley Publishing, 1976
- [2] Andrews, G. E. and Merca, M., *The truncated pentagonal number theorem*, J. Combin. Theory Ser. A, **119** (2012), 1639–1643
- [3] Euler, L., *Introduction to Analysis of the Infinite, Vol. 1* (Translation by J. D. Blanton), Springer-Verlag, 1988
- [4] Guo, V. J. W. and Zeng, J., *Two truncated identities of Gauss*, J. Combin. Theory Ser. A, **120** (2013), 700–707
- [5] Sloane, N. J. A., *The On-Line Encyclopedia of Integer Sequences*, (2014). Published electronically at <http://oeis.org>

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