Some Interesting Formulas Involving the GCD

John D Mangual

Sometimes, when I read a String Theory paper, I try to find a verifiable statement. Here is one I found in a paper:

$$I^{\mathcal{N}=1^*}(N,1,0) = N\sum_{d|N} 1 = N\sigma_0(N)$$

This number is called a **superconformal index** and it also equals:

$$I^{\mathcal{N}=1^*}(N,N,n) = \sum_{d|N}\sum_{l=1}^{N} \gcd(d,l)$$

I was heckled on MathOverflow for posting such an elementary formula. It's not mine, it's his.

References

(1) arXiv:1606.01022 The Arithmetic of Supersymmetric Vacua. Antoine Bourget, Jan Troost. physics.hep-th.

(2) arXiv:1511.03116 On the N=1* Gauge Theory on a Circle and Elliptic Integrable Systems. Antoine Bourget, Jan Troost. physics.hep-th.

(3) arXiv:1506.03222 Counting the Massive Vacua of N=1* Super Yang-Mills Theory. Antoine Bourget, Jan Troost. physics.hep-th.

(4) arXiv:1305.0318 Reading between the lines of four-dimensional gauge theories. Ofer Aharony, Nathan Seiberg, Yuji Tachikawa. WIS/03/13-APR-DPPA, UT-13-15, IPMU13-0081. physics.hep-th.