M Gmail   **M. D. Schmidt <maxieds@gmail.com>**

Submission to the Journal of Integer Sequences
17 messages

Maxie Schmidt <maxieds@gmail.com>   Tue, Oct 17, 2017 at 9:45 PM
To: shallit@cs.uwaterloo.ca

Dear Editor,

I am submitting the attached article I have written titled "Exact Formulas for the Generalized Sum-of-Divisors Functions"
to the Journal of Integer Sequences for review. While the topic is definitely number-theoretically themed, I think that it is
appropriate for the readership of the journal since it connects the special (integer-valued) sum-of-divisors functions with
the primes, harmonic numbers, and the Bernoulli polynomial sequence. Upon acceptance of the article I will format it in
latex format compliant with the journal's standards.

A list of some of the relevant OEIS sequence entries associated with the article are as follows:
A000005; A000203; A000040; A001008; A001157 - A001160; A002805; A000396; A013954 -
A013972; A027642; A027641.

Potential reviewers for the article include Steven J. Miller and Mircea Merca.

Thank you for your time and for considering my article.

Sincerely,

Maxie D. Schmidt

📄 **divisor-sigma-formulas.tex**
72K

Jeffrey Shallit <shallit@uwaterloo.ca>   Fri, Oct 27, 2017 at 6:53 PM
Reply-To: shallit@cs.uwaterloo.ca
To: Maxie Schmidt <maxieds@gmail.com>
Cc: shallit@cs.uwaterloo.ca

We received your paper and we sent it to a referee.

In any future version
      -- please use 12pt as the style guide explicitly specifies

      -- your claim that that Eq. (9) provides the "best known optimal
asymptotic bound" is untrue. This is the very famous "Dirichlet divisor problem" (google it) and the best result for the error
term
currently known is not $O(x^{1/2})$ as you claim, but rather $O(x^{131/416})$, obtained by Huxley in 2003. I also doubt the
optimality of the two equations below it. Much work has been done on that kind of thing and you should spend some
effort tracking down the results.

Regards,

Jeffrey Shallit
Journal of Integer Sequences

On 10/17/17 9:45 PM, Maxie Schmidt wrote:
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[Quoted text hidden]

Maxie Schmidt <maxieds@gmail.com>   Sun, Oct 29, 2017 at 7:08 PM
To: shallit@cs.uwaterloo.ca

Dr. Shallit,

I apologize for the inaccurate bound. I wasn't aware of the most recent bound for the divisor problem (which I am definitely familiar with from the references). Would you like for me to correct the out-of-date reference and send you a new version which you can pass along to the referee? However, I don't think that this affects the primary new approach to the results in the paper. I only intended this to be one possible avenue for establishing new corollaries based on the new formulas for the generalized sum-of-divisor functions which I prove in the paper. Please let me know either way.

Maxie

[Quoted text hidden]

Jeffrey Shallit <shallit@uwaterloo.ca>   Mon, Oct 30, 2017 at 6:56 AM
Reply-To: shallit@cs.uwaterloo.ca
To: Maxie Schmidt <maxieds@gmail.com>, shallit@cs.uwaterloo.ca

These are not "recent" results. The first improvement to the 1/2 exponent you claim was made over 100 years ago.

See http://mathworld.wolfram.com/DirichletDivisorProblem.html

You need do nothing now; we are waiting for a report from the referee.

Regards,

Jeffrey Shallit
Journal of Integer Sequences

On 10/29/17 7:08 PM, Maxie Schmidt wrote:

> Dr. Shallit,
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> I apologize for the inaccurate bound. I wasn't aware of the most recent bound for the divisor problem (which I am definitely familiar with from the references). Would you like for me to correct the out-of-date reference and send you a new version which you can pass along to the referee? However, I don't think that this affects the primary new approach to the results in the paper. I only intended this to be one possible avenue for establishing new corollaries based on the new formulas for the generalized sum-of-divisor functions which I prove in the paper. Please let me know either way.
>
> Maxie
>

[Quoted text hidden]

Maxie Schmidt <maxieds@gmail.com>   Tue, Oct 31, 2017 at 5:54 AM
To: shallit@cs.uwaterloo.ca

In some consolation of my missing the most accurate reference on the Dirichlet divisor problem, I will point out that the divisor sums, $\sum_{d|n} \tau_x^{(\alpha)}(d)$, defined in my article are deeply related to the Merten's function (and slightly more generalized forms of it). It's not obvious from the manuscript, but is a straightforward consequence of the results in the article. Moreover, these new divisor sum formulas provide a means for expressing the Mertens function, M(x), in new expressions involving sums over primes, prime powers and the generalized harmonic numbers. I hope that you will take this consequence of the results into account when you go back over the paper with the referee.

Maxie
[Quoted text hidden]

Jeffrey Shallit <shallit@uwaterloo.ca>   Sat, Feb 24, 2018 at 4:19 AM
Reply-To: shallit@cs.uwaterloo.ca
To: Maxie Schmidt <maxieds@gmail.com>
Cc: shallit@cs.uwaterloo.ca

Dear Colleague;

Attached please find a referee report on your paper

"Exact Formulas for the Generalized Sum-of-Divisors Functions"

that you submitted to the Journal of Integer Sequences.

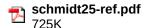The referee feels there are several significant errors in your paper that need correction.

Please revise your paper, taking into account (a) the report of the referee and (b) the remarks we sent you when you submitted your paper.
Then send us the new version. At this time we will ask the referee to read it again. It may be helpful to attach a list summarizing the changes you made.

Regards,

Jeffrey Shallit
Journal of Integer Sequences

[Quoted text hidden]

> 📄 **schmidt25-ref.pdf**
> 725K

Jeffrey Shallit <shallit@uwaterloo.ca>   Sat, Feb 24, 2018 at 5:57 AM
Reply-To: shallit@cs.uwaterloo.ca
To: Maxie Schmidt <maxieds@gmail.com>
Cc: Jeffrey Shallit <shallit@uwaterloo.ca>

It is not clear to me this actually got sent, so I am sending it again.
[Quoted text hidden]

> 📄 **schmidt25-ref.pdf**
> 725K

Maxie Schmidt <maxieds@gmail.com>   Sat, Feb 24, 2018 at 6:01 AM
To: shallit@cs.uwaterloo.ca

Yes, I have received both referee reports and will work on getting you the requested revisions to both. Thank you. I should apologize a little bit for the sloppiness in this paper. I have been working more with these formulas in the context of bounds on the Mertens function at GA Tech recently. I have a few other corrections and notes to add more recently. I had forgotten I submitted it to JIS. I will probably end up re-writing and re-organizing most of this article up to the applications section when I return the revised manuscript. I will also include a working Mathematica notebook to check these formulas with the new submission. It could take me a few weeks to fully re-work the article with my obligations at school right now.

Maxie
[Quoted text hidden]

Maxie Schmidt <maxieds@gmail.com>   Sat, Mar 10, 2018 at 8:09 AM
To: shallit@cs.uwaterloo.ca

Dear Dr. Shallit:

My new manuscript is revised according to the referee suggestions I received several weeks ago. I had to rework and update much of the material from the original draft read by the reviewer. You will find that much of the paper is the same but corrected and reorganized. I also incorporated your suggestions on the current bounds in the asymptotic formulas cited in the applications section.

Please let me know if I can do anything else to help you process the article, or if there are any remaining corrections that need to be made to it. I have also attached a Mathematica notebook that verifies the formulas cited in the article. Please forward this file to the referee along with the updated manuscript.

Maxie
[Quoted text hidden]

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3 attachments

divisor-sigma-formulas-2018.03.10-v1.pdf
534K

divisor-sigma-formulas-2018.03.10-v1.tex
69K

sod-formulas.nb
620K

Jeffrey Shallit <shallit@uwaterloo.ca>   Fri, Mar 30, 2018 at 2:32 PM
Reply-To: shallit@uwaterloo.ca
To: Maxie Schmidt <maxieds@gmail.com>
Cc: shallit@uwaterloo.ca

We received your revision and we sent it back to the referee.

In any future version, please fix the following latex and presentation problems.

Do not write

"$p \not{\mid} n$". It is too ugly.

Instead use

$x\nmid y$

which can be found in the amssymb package.

Don't underline things. We don't use underlining in our
Journal.

Adjust tables so they fit correctly in the margins.
This can be done, for example, with \scalebox .

Don't overcapitalize, as in "Ramanujan's Sum" and
"Notes on the Characterizations of the Theorem and Its Variants)"

Don't define one thing with a brace as part of another, as
you do on page 8. First define the Q, then
write the $S_{1,n}(q)$ in terms of it.

My guess is that (as I mentioned before to you) the
two formulas following (13) for d(n)/n and sigma(n)
have been improved. These results were proved something
like 120 years ago and it is not reasonable to think that
no progress has been made since then. You need to do
more work looking up results in the literature.

Don't cite articles like this: "See the 2018 article "A Partition Identity Related to Stanley's Theorem" by Merca and Schmidt to appear in the American Mathematical Monthly". Do it in the
conventional way.

Don't put "cf." in italics.

Don't use square brackets for grouping, as the style guide
says. Use parens.

"Sierpinski" needs an accent.

Jeffrey Shallit
Journal of Integer Sequences

On 3/10/18 8:09 AM, Maxie Schmidt wrote:
> Dear Dr. Shallit:
>
> My new manuscript is revised according to the referee suggestions I received several weeks ago. I had to rework and update much of the material from the original draft read by the reviewer. You will find that much of the paper is the same but corrected and reorganized. I also incorporated your suggestions on the current bounds in the asymptotic formulas cited in the applications section.
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> Please let me know if I can do anything else to help you process the article, or if there are any remaining corrections that need to be made to it. I have also attached a Mathematica notebook that verifies the formulas cited in the article. Please forward this file to the referee along with the updated manuscript.
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> Maxie
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> On Sat, Feb 24, 2018 at 6:01 AM, Maxie Schmidt <maxieds@gmail.com <mailto:maxieds@gmail.com>> wrote:
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>>   check these formulas with the new submission. It could take me a few
>>   weeks to fully re-work the article with my obligations at school
>>   right now.
>>
>>   Maxie
>>
>>   On Sat, Feb 24, 2018 at 5:57 AM, Jeffrey Shallit
[Quoted text hidden]

Jeffrey Shallit <jeffrey.shallit@uwaterloo.ca>   Tue, Jun 5, 2018 at 2:24 PM
To: Maxie Schmidt <maxieds@gmail.com>, Jeffrey Shallit <jeffrey.shallit@uwaterloo.ca>

Dear Colleague,

We have now received a report on your revision, and it is attached. As you can see, the referee has a number of corrections to offer.

Please fix all the problems that the referee found.

Please fix all the problems in our previous message of March 30.

Please also do more work on the historical background of your paper as mentioned in that message, updating your statements to reflect modern understanding of sigma(n) and d(n).

Please read the style guide and convert the format of your paper to the format of our Journal.

Then, send us the final version of your paper for publication.

From: Jeffrey Shallit <shallit@uwaterloo.ca>
Sent: Friday, March 30, 2018 2:32:22 PM
To: Maxie Schmidt
Cc: Jeffrey Shallit
Subject: Re: Submission to the Journal of Integer Sequences

[Quoted text hidden]

📄 **schmidt26-ref.pdf**
143K

Maxie Schmidt <maxieds@gmail.com>   Tue, Jun 5, 2018 at 7:55 PM
To: Jeffrey Shallit <jeffrey.shallit@uwaterloo.ca>

Can you point me in the direction of some good references for the sum-of-divisors function average order sum estimates? I have found the most recent results by Huxley and Carella, both of which I cite in the previous revision, for the divisor function, but the sum-of-divisors function estimates seem to be less well studied from what I can see. Perhaps there's less of an immediate geometric interpretation to these asymptotic formulas? I would appreciate the citations.

Maxie
[Quoted text hidden]

Jeffrey Shallit <shallit@uwaterloo.ca>   Tue, Jun 5, 2018 at 9:55 PM
Reply-To: shallit@uwaterloo.ca
To: Maxie Schmidt <maxieds@gmail.com>

No, sorry, that is the job of the author, not the editor.

> On 6/5/18 5:55 PM, Maxie Schmidt wrote:
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>> Maxie
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Then, send us the final version of your paper for publication.

From: Jeffrey Shallit <shallit@uwaterloo.ca
<mailto:shallit@uwaterloo.ca>>
Sent: Friday, March 30, 2018 2:32:22 PM
To: Maxie Schmidt
Cc: Jeffrey Shallit
Subject: Re: Submission to the Journal of Integer Sequences

[Quoted text hidden]

Maxie Schmidt <maxieds@gmail.com>   Tue, Jun 5, 2018 at 10:46 PM
To: shallit@uwaterloo.ca

So you couldn't find a good reference either? Let's see what my superstar adviser can come up with to help a student.
[Quoted text hidden]

Jeffrey Shallit <shallit@uwaterloo.ca>   Wed, Jun 6, 2018 at 6:53 AM
Reply-To: shallit@uwaterloo.ca
To: Maxie Schmidt <maxieds@gmail.com>

No, I didn't look. It's not my job -- it's yours. If you don't know how to do bibliographic search for such things, please go to your university library and ask them to help you.

On 6/5/18 8:46 PM, Maxie Schmidt wrote:
So you couldn't find a good reference either? Let's see what my superstar adviser can come up with to help a student.

On Tue, Jun 5, 2018 at 9:55 PM, Jeffrey Shallit <shallit@uwaterloo.ca <mailto:shallit@uwaterloo.ca>> wrote:

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> <mailto:jeffrey.shallit@uwaterloo.ca>
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>>
>> Then, send us the final version of your paper for publication.
>>
>>
>>   --
>> *From:* Jeffrey Shallit <shallit@uwaterloo.ca
>> <mailto:shallit@uwaterloo.ca>
>>   <mailto:shallit@uwaterloo.ca <mailto:shallit@uwaterloo.ca>>>
> [Quoted text hidden]
>>   <mailto:maxieds@gmail.com <mailto:maxieds@gmail.com>>
> [Quoted text hidden]
>>   <mailto:shallit@uwaterloo.ca <mailto:shallit@uwaterloo.ca>>
> [Quoted text hidden]

Maxie Schmidt <maxieds@gmail.com>   Wed, Jun 13, 2018 at 5:40 PM
To: shallit@uwaterloo.ca

I have scoured the internet and the university's library for better references to the third sum for the summatory function of $\sigma_1(n)$. I have also asked a few peers and professors for references and/or obvious better bounds than the classical error term for this sum given in Hardy and Wright. I even asked on Math Stack Exchange for input. The consensus seems to be that this problem just isn't as well studied as the divisor function sums and so there does not appear to be any more recent work done on improving this error term beyond the standard classical errors proved in any analytic number theory course. There is simply no better reference to cite for this particular sum. I am done editing the rest of the paper and have cited references to improved error terms on the other two sums. Do you want me to submit the revised manuscript, or continue to search hopelessly for a reference that may very well just not exist at the moment?

Maxie
[Quoted text hidden]

Jeffrey Shallit <shallit@uwaterloo.ca>   Wed, Jun 13, 2018 at 6:26 PM

Reply-To: shallit@uwaterloo.ca
To: Maxie Schmidt <maxieds@gmail.com>, Jeffrey Shallit <shallit@uwaterloo.ca>

Dear Colleague,

It took me 30 seconds with google scholar to find that the error term for the average order of the sum-of-divisors function was improved to
$O(x \log \log x)$ by Gronwall and Wigert in 1913 and 1914. There is a more recent paper by Petermann even improving that.

(You only had an error term of $O(x \log x)$ in the most recent version you sent to JIS.)

So I don't think you really made a serious effort to do what we asked.

Based on this, and based on your most recent e-mail messages, which to me seem rather rude, I think you would be much happier at a different journal. So we are rejecting your paper, and wish you better luck elsewhere.

Should you wish to submit a new paper in the future, please make a more serious effort to make sure you are citing all relevant work, and consider adopting a different tone in your correspondence.

Regards,

Jeffrey Shallit
Journal of Integer Sequences

On 6/13/18 5:40 PM, Maxie Schmidt wrote:

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> > >
> [Quoted text hidden]
> > > >   <mailto:shallit@uwaterloo.ca
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