DSA Newscast

In this issue . . .

The Dozenal Society of America is a voluntary, nonprofit educational corporation, organized for the conduct of research and education of the public in the use of dozenal (also called duodecimal or base twelve) in calculations, mathematics, weights and measures, and other branches of pure and applied science.

Getting Started with Dozens, Part III

Here we are in Part III of this little series on getting our dozenal feet under us. This month, we will look a little on doing more complex arithmetic in our heads. Not *too* complex; we're not aiming at everyone becoming a so-called "human calculator." However, there is no reason that a normal, non-mathematician cannot do some reasonably difficult mental calculation.

Remember Place Value

Place value is a great gift for mental mathematics. Especially with addition, subtraction, and multiplication, if you can keep track of each digit, you can mentally calculate the answer.

Consider adding 48 and 93. It may seem daunting to the eye, but just keep track of each individual digit and add them up. The ones are easy: 8 + 3 = ε. Next, add the next digits. Keep in mind, though, that these are not simply 4 and 9; they are 40 and 90. We can certainly just add the zero again later, though; so we do 4 + 9 = 11, then add the zero back and know that 40 + 90 = 110. Remembering our ε from earlier, we add that to our answer: 110 + ε = 11ε. So 48 + 93 = 11ε.

One can easily add three- and four-digit numbers with this method, and longer ones if you can keep track of the digits.

We can do the same thing with subtraction, but in reverse. Consider now 93 − 48. In this case, we'll do it the other way around, subtracting the higher-order digits before the lower. 90 − 40 = 50. That leaves us with 3 − 8, which gives −5; since it's a negative result, we subtract it from 50. (A positive result, say from 98 − 43, would mean that we add it.) Since we learned our "totals" last month, we know that 10 − 5 = 7, so 50 − 5 = 47. 93 − 48 = 47.

Multiplication is quite a bit trickier, because we have to maintain in our memory multiple subtotals, a number equal to the number of digits in the multiplier. And with division, this method does not work very effectively at all. However, for addition and subtraction, it is a very useful strategy for mental calculation.

Double and Halve

We saw before the multiplication and division are very difficult to do mentally by the place-value method, which is essentially just the mental version of the way we calculate on paper. However, doubling and halving can help fill that gap.

As often as you can, reduce a problem to doubling and halving. These two operations are often quite easy to do, and you can often divide problems into these.

Consider multiplying 38 by 4. You may be able to multiply this directly by 4, but for now, try doubling twice; that is, double 38 and then double that. Doubling 38 is easy; 30 × 2 = 60, 8 × 2 = 14, and 60 + 14 = 74, so 38 × 2 = 74. You may

even find it easier to work it as an addition problem, 38 + 38. Now we need merely double again: 74 × 2. 4 × 2 is 8, 7 × 2 is 12, so 70 × 2 is 120; 120 + 8 is 128. So 38 × 4 is 128.

Doubling and halving is the biggest part of the strategy, but not the only part: divide large problems up into small ones. Say you need to divide a restaurant check into six parts; first see if the direct solution (dividing by six) is appropriate, then divide the problem up if necessary.

If the check is $19;69, we can easily see that the number is not well-suited to dividing by 6, but *is* clearly well-suited to dividing by 3; every digit is divisible by 3. 9 ÷ 3 is 3, 6 ÷ 3 is 2, 19 ÷ 3 is 7. So one third of $19;69 is $7;23. Now that we've divided by 3, we need only divide by 2 to get the whole divided by 6; that is, we need to halve $7;23. 7 ÷ 2 is 3;6; 23 ÷ 2 is 11;6. Remembering that 3;6 is the dollars and 11;6 is the cents, we add them together: $3;716, or round off to $3;72.

Such methods take some practice, but no more than normal math does; and they are particularly well-suited to dozenal, because dozenal has so many even divisors to take advantage of. So give it a try; you'll find that you love dozenals more every time it makes a hard math problem easier.

Dozenal News

La Zonnomie by A.-D. Gautier Published

In our continuing quest to demonstrate that dozens is not a provincial Anglo-Saxon concern, but an international human one, we are pleased to announce the publication of the French-language work *La Zonnomie*, by A.-D. Gautier.

http://www.dozenal.org/drupal/content/gautier-la-zonnomie.html

This work presents an entirely new, separate-identity number system, along with measurement and monetary systems. Though these have not been adopted by anyone other than M. Gautier, to my knowledge, the work still presents the dozenal system in an excellent light.

New Article on Dozenals

Owlcation has published a brief guide to dozenals (which includes, of course, a link to our Society's webpage) this past November:

https://www.owlcation.com/stem/duodecimal-base-12-dozenal

The article doesn't do a particularly good job of explaining dozenals, nor of showing that the benefits of positional notation adhere just as much to dozenal as to any other base; but it is interesting to see oour favorite base getting some press in more mainsteam venues.

Dozenal Javascript Package

A Javascript module for converting decimal to dozenal is available here:

https://www.npmjs.com/package/dozenal

This may well be quite useful, particularly to web-programming types.

Dozenal Python Module

For those programmers enamored with Python, there is now a partially-written dozenal module available:

https://sourceforge.net/projects/python-dozenal-duodecimal/

At the moment, it only supports integers, but it's better than nothing.

Tolkien's Dozenal System Explained

Tolkien fans will be delighted to see a loving exposition of the Elvish means of counting in base twelve:

http://www.elvenesse.net/blog/counting-the-elvish-way-duodecimal-system

Using "A" and "B" for ᘔ and Ɛ (when not using the authentic Tengwar, that is), the article is worth a read as a simple explanation of dozenal even if one is not interested in Elvish. While I had heard it had been remarked that Tolkien's elves preferred to count in sixes and twelve, I had no idea that the system was this well worked out; Tolkien fans will doubtlessly be interested.

Society Business

German-Speakers Needed

Speak German? We need your help! The DSA has long been expanding its non-English materials (we've published works in French, Spanish, Esperanto, and Latin), and in our search for such materials we've turned up an old text in German: *Vom Zwölfersystem zum Zählen und Rechnen und zur Eintheilung der Maase, Gewichte und Münzen verglichen mit dem Zehnersystem*, by M. Zehner. (Apologies if there are errors in that transcription; the book is typeset in Fraktur, and it's quite possible I made a mistake.)

If you're interested in translating this for the DSA, please let us know.

If translating it seems like a lot of work, but you're willing to proofread for us, please let us know, as well. We'd like to publish the book in its original language, but it's very difficult to ensure an accurate transcription without some knowledge of the German language.

Thanks!

Website Update

In addition to publishing *La Zonnomie* by Gautier, we have provided a few updates to the website. If you'd like to subscribe to our RSS feed, that now works:

http://dozenal.org/drupal/rss.xml

This will help keep you up-to-date on updates and new information. We have also committed an update which should somewhat improve the site's appearance in smaller, particularly mobile, browsers.

Volunteers Needed

As mentioned earlier, the DSA is an all-volunteer organization, and we pay no salaries. As a result, everything that we do comes out of the spare time of our members, time that they have to take away from their families, jobs, or other obligations.

We all love dozenals and enjoy assisting the Society in educating people about them; however, as the Society expands and does more, we find ourselves in need of more help.

Fortunately, the Society has a large membership with a very broad range of professions and experience. If you think you can spare any time or effort for the cause of educating the world about dozenals, please let us know:

contact@dozenal.org

You can help as much or as little as you'd like. Thank you.

DSA Printed Works Still Available

The DSA is still offering a great selection of printed works, which can be purchased via Lulu; see the end of this *Newscast* for pricing. Any profits (for many of these works there is none) go to the Society.

Poetical Diversion

The Base Less Used

Two bases lay in a mathy wood,
and though I knew that I could use both
I sought for the better; and long I stood
just using the one I was taught I should,
mired in arithmetical undergrowth;

Then I glanced at Twelve; it was twice as fair,
and having no doubt a much better claim
because it had factors Ten could not pair,
even Three, a great prime which Ten cannot bear;
oh, as bases these two clearly aren't the same!

So these two numbers before me lay,
and I knew which one had the stronger back
to bear my arithmetic, though some say
loving Twelve is a foolish and silly way,
for their Ten has long led the radix pack.

And now I tell this tale with a sigh,
though ages and ages I've yet to lose:
Two bases presented in math, and I—
I took the best which caught my eye,
And Twelve was the right one to choose.

DONATIONS

Members, please remember that while dues are no longer required for membership, we still rely on the generosity of members to keep the DSA going. Donations of any amount, large or small, are welcome and needed.

A donation of $16; ($18.) will procure Subscription membership, and entitles the payer to receive both a digital and a paper copy of the *Bulletin* if requested. Other members will receive only a digital copy. To invoke this privilege, please notify the Editor of the Bulletin, John Volan, at

editor@dozenal.org

As members know, we are a volunteer organization which pays no salaries. As such, every penny you donate goes toward furthering the DSA's goals.

It may be worth considering a monthly donation; say, $3, or $6, or whatever seems reasonable to you. This can be set up quite easily with Paypal, which is available at our web site.

Of course, if you prefer to donate by check, you may send them to our worthy Treasurer, Jay Schiffman, payable to the Dozenal Society of America, at:

Jay Schiffman
604-36 South Washington Square, #815
Philadelphia, PA 19106-4115

Remember, too, that the DSA is a 501(c)(3) tax-exempt organization; as such, your contributions may be tax deductible under applicable law.

Thanks again for your assistance; it's your donations that keep the DSA going. We can't keep doing it without you.

FOR SALE

The DSA is pleased to offer the following for sale. These are all either at cost, or the proceeds go to the Society.

Item	Price ($)
Dozenal Wall Calendar, 1201	10.05
Dozenal Planning Calendar, 1201	8.32
TGM: A Coherent Dozenal Metrology	8.00
Manual of the Dozenal System	3.46
A Dozenal Primer	4.50

Prices are, unfortunately but by necessity, in decimal. To find these works, simply go to: http://www.lulu.com/shop/shop.ep and enter the appropriate terms. E.g., searching for "TGM dozenal" will turn up the TGM book.

We hope to offer other titles, and even some other items (such as dozenal clocks and the like), in the future.

EACH ONE, TEACH ONE