ISSN 0046-0826

THE DUODECIMAL BULLETIN

79;(93.)

"Really Neat!"

-Comment by a student at our 1996 Annual Meeting at Hofstra University

Volume 3*; (46.)
Number 2; (2.)
11*5; (1997.)

THE DOZENAL SOCIETY OF AMERICA
c/o Math Department
Nassau Community College
Garden City LI NY 11530-6793

MEMBERS SEE PAGE 4 FOR THREE VERY IMPORTANT ANNOUNCEMENTS

THE DOZENAL SOCIETY OF AMERICA

(Formerly: The Duodecimal Society of America)

is a voluntary, nonprofit, educational corporation, organized for the conduct of research and education of the public in the use of base twelve in numeration, mathematics, weights and measures, and other branches of pure and applied science.

Membership dues are $12.00 (US) for one calendar year. Student Membership is $3.00 (US) per year, and a Life Membership is $144.00 (US).

The Duodecimal Bulletin is an official publication of the DOZENAL SOCIETY OF AMERICA, INC., c/o Math Department, Nassau Community College, Garden City, LI, NY 11530-6793.

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THE DUODECIMAL BULLETIN

Whole Number 79; (Seven Dozen Nine)

Volume 3; (3 Dozen Dek)*

Number 2;

*11*5; (1997)*

FOUNDED
1160; (1944)

IN THIS ISSUE

ANNOUNCEMENT OF OUR ANNUAL MEETING

The Dozenal Society of America will convene on Saturday October 16; 11*5; (October 18, 1997) at *; AM. (10:00 AM.) at Nassau Community College in the old Student Union Building. In addition to our regular Board of Directors Meeting and the Annual Membership Meeting, we expect some short presentations from a number of speakers on topics of dozenal interest. In particular, our Guest Speaker via the medium of technology will be *William J. Lauritzen* of Glendale, CA (member Number 330;). Bill's presentation is entitled *Numbers of the Future*. We would especially welcome contributions from student members. Please mark this date on your calendar. You will be extremely disappointed if you miss our annual meeting. For further information, call (516) 669-0273. □

*11*5 — DUES — 11*6*

Dues are due as of January first of each year. If you have not paid your 11*5 (1997) dues as yet, please send them in as soon as possible. Our continuing efforts to educate the public regarding the benefits of dozenal counting and measuring depend in a large part upon the generosity of our members, many of whom contribute over and above the price of the dues. Our ❤ -felt thanks to them.

Dues are still only one dozen dollars (US) per year. Student dues are three dollars (US), and Life membership is a gross of dollars (US). Why not send in your dues for both 11*6 ('97) and 11*6 ('98) at the same time? We would appreciate it, and you would save yourself time, effort and postage. □

MEMBERS PLEASE READ AND RESPOND!

In order to facilitate communication between and among ourselves we will make available a list of members names, addresses, fone numbers, e-mail addresses and fax numbers to members in good standing. If you do NOT want your data included, please inform us as soon as possible. If we do not have your current and you would like it included, please send such data to us as soon as possible. (See "From the "Editor", page 16;.) □

SHORTCUTS FOR WRITING DATES AND TIMES IN THE DOZENAL SYSTEM

Robert J. McGehee
Flagstaff, AZ

The convenience of the dozenal system allows for some special refinements when it comes to the writing of the date and time. First, let us consider the calendar date by itself. Since there are a dozen months in the year, they can automatically be treated as dozenal fractions of the year in the dozenal system of numeration and written as such. Before this can be accomplished, however, it is initially necessary to change the order in which the months and the years are conventionally written. In America, the month is written first, followed by the day and the year; in other countries, especially in Europe, one normally writes the day first, then the month, and finally the year. There is, however, yet a third method to represent the calendar date, which is known as the *Scientific Format.* In this system, which is clearly the most logical, all the units of time are written from left to right in descending order of size. Thus the year, which is the largest unit, comes first, followed in turn by the month and day. Therefore, if we take the date on which I started writing this article, 1/28/1997, and rewrite it in scientific form, we obtain 1997/1/28. In either case, when writing the date in the old-fashioned decimal system, a mark such as a slash or a hyphen must be used to indicate the divisions between the year, the month, and the day. Now when we write the scientific form of the above date in the dozenal system, we will obtain *11*5/1/24.* After a little thought, however, it is evident that there is really no reason to have a slash between the year and the month in the dozenal system. Since the Dozenal Society of America recommends using a semicolon or Humphrey point to indicate dozenal fractions[1], a semi-colon can just as logically be used to separate the year from the month in dozenal dates. (*Editor's Note:* Superscripts such as the [1] above refer to endnotes at the conclusion of the article.) In our favorite system, one has the added advantage that the months of October and November can be economically represented as single-digit numerals, * (dek) and # (el) respectively, instead of the two-digit numerals "10" and "11" needed in the awkward decimal system. Thus the above date can ultimately be rewritten as *11*5;1/24.* Notice that in the latter case, when the date is written according to the scientific format and in base twelve, we are in reality dealing with only two separate numbers: There is the number representing the year (with the month automatically represented as a one-place dozenal fraction), and the number indicating the day of the month. While the former always grows by one with each passing year, the latter is limited to fixed cycles according to the rules of the Gregorian calendar. The number of days in the month can vary from as little as two dozen and four (28) in the case of February in non-leap years to as much as two dozen and seven (31) in the case of months such as March or July. (Naturally, since the days can in no way be considered dozenal fractions of the months, they must still be separated from the months by an appropriate mark such as a hyphen or a slash, just as they are in the decimal system.)

One interesting issue that needs to be addressed is the manner of representing the month of December: Since December is the twelfth month, it should logically be written in the dozenal system as 10. However, when we write the months as dozenal fractions of the year, the month which comes after November, itself the "#th" month, must logically be written as month "0", and the "1" will automatically carry over to the year, with the result that December 1997, for example, turns out to be month "zero" of 1998. Such a practice can give the appearance that the year begins in December and terminates in November. The other option of course, would entail the renumbering of all the months so that January, which is traditionally the first month of the year, would be numerically as month "0", February as month "1", and so forth up to December, which would be month "#". In the latter case, one would then have to remember to subtract "one" from the number which one formerly associated with each month every time one wished to write the date in dozenal numerals, but at least in this way December, the new "el" month, would still be numerically associated with the current year instead of the coming year. It is worth mentioning that the option of renumbering the months, so that month "0" would be the "first" month, and so on, would tend to parallel the current practice of referring to the majority of years which begin with 19-- as belonging to the "twentieth century" and to the majority of those which are soon to begin with 20-- as belonging to the "twenty-first century." The identical type of convention likewise explains why the years commencing with --00 to --09 of any given century are sometimes referred as the *first* decade of that century. Needless to say, such a practice can be quite confusing to some people.[2]

At this juncture, we thus have two choices: Either leave the numeral designations of the months alone but have the 10 for the twelfth month, December, carry over to the next year, or else renumber all the months in order to avoid the problem. I had initially considered the second option but subsequently decided against it because it would be more trouble than it is worth: Not only would the stipulation that people subtract "one" from the number which they formally associated with each month lead to confusion, but, moreover, such a practice could not possibly be self- evident to people who were not previously advised of it. In other words, few people would be likely to guess that such a drastic measure would be employed to solve such a trivial problem. On the other hand, though, a dozenal date system which maintains the current numbering for the months is perfectly self-explanatory, and the fact that the month of December counts as month "zero" of the succeeding year is perfectly logical if one stops to reflect upon it.[3] Naturally, it goes without saying that one must definitely choose between one or the other of these two conceivable ways of representing the months of the year as dozenal fractions: Both systems cannot be utilized simultaneously! Summarizing, if my reasoning is clear thus far, then I trust the reader will concur that it is better for us to preserve the conventional numbering of the months despite the fact that the month of December will be numerically associated with the following year.[4]

At this point the reader may well ask why it is necessary or even desirable to represent the months as dozenal fractions of the year in the first place? The reason is simply one of economy: If such a procedure is not followed, the full power of the dozenal system is not being utilized. For example, if we write the calendar date in dozenals, but according to the conventional American practice by "month, day, and year," a date such as December 25, 1996 will come out as *10/21/11*4.* As the reader can see, in this latter case two spaces must be reserved in the month slot in order to make room for December, which will now have to be designated by a 10 in the dozenal system.[5] Such a practice does not bring about any saving

of space over the awkward decimal representation of the months which itself also requires two printed spaces in order to numerically represent the months of October, November, and December as "10, 11, and 12" respectively. Furthermore, in such a case we would be dealing with three separate numbers to represent the months, the days, and the years in turn, and no hyphens or dashes could be eliminated. On the other hand, when we write the months of the year in the dozenal system as dozenal fractions immediately following the year we need use only one space to represent all the months from zero to el, that is, from December to November respectively, and since, as the reader will recall, we are now only dealing with two numbers, one number doing justice for both years and months, and the other handling the days, we can eliminate a dividing mark to boot. Finally, a very nice advantage to writing the year first and the month second is that it permits convenient and unambiguous ways to abbreviate the date depending on the need at hand, such as when one only wants to indicate the last few digits of the year, or when one needs to indicate the months without reference to the days of the month: Compare the following potentially confusing abbreviated dates in the conventional system, "01/97, and 11/98," with their logically straightforward corresponding forms in the dozenal system, "**5;1* and **6;#*".[6] While the dozenal abbreviation makes it clear that only part of the year and the month are represented, the decimal form does not make it obvious that the days have been dropped from the date.

One last remark must be made here, inasmuch as questions of calendar reform quite often crop up in dozenal circles: The above-mentioned suggestions for simplifying the writing of the calendar date are by no means intended to imply any proposed change in the calendar system itself. All of the calendar dates in the above examples refer strictly to conventional dates in the familiar Gregorian calendar system, with the only difference that their representations in the dozenal system are more compact and economical than they are in the conventional decimal numerals. It is true that the traditional months of the year in the Gregorian calendar are far from being precise dozenal divisions of the year. While the months in the present system, as mentioned above, vary in length from two dozen and seven (31) to two dozen and four (28) days, a more perfect calendar with months which are more evenly divided the year into twelve parts would have the months alternating more or less regularly between two dozen and six (30) and two dozen and seven (31) days.[7] A further possible refinement would place the first day of the first month of the year as close as possible to the beginning of a particular solstice or equinox, but at the present time such observations are neither here nor there. On the other hand, the dozenal conventions presented here will always be applicable to any future reformed calendar system which has twelve months in a year.

The rules for simplifying and combining the day of the month and the time of the day are straightforward. According to the Manual of The Dozen System, a pamphlet available from the DSA, the Do-Metric circle of time divides an entire twenty-four hour day by successive powers of twelve. The resulting units of time are designated therein as duors, temins, minettes, and grovics.[8] Mathematically these correspond to edos, egros, emos, and edo-mos, etc., of a standard day following the usual terminology of the dozenal society.[9] The proposed time system is thus analogous to "decimal metric time" in which the day would be divided into ten hours, with further divisions of a hundred minutes with a hundred seconds, but with none of the awkward inconveniences of the decimal system. In other words, the Do-Metric system defines the time of day as being identical to the dozenal fraction of the day written in dozenal notation, we can automatically express the day of the month and the time of the day as a single number with a whole and a fractional part. In other words, we can say the day of the month and the time of day in a single breath: Thus, we can now refer to six a.m. on January 28th as "January two do four and a fourth" and write as January *24;3*. Likewise, at twelve noon the combined dozenal time and the day of the month will be "...two do four and a half" (*24;6*), at six p.m. "...two do four and three quarters" or "...two do four point nine" (*24;9*), and at eight p.m. "...two do four point dek" (*24;⚹*).

Finally, when we write the entire date and time of day together the dozenal system allows us an even more economical representation vis-a-vis the conventional system: By way of comparison, let us begin with the conventional decimal representation of "ten forty-five p.m. and thirty-five seconds on October the thirteenth of 1997": 10:45:35 p.m., 10/13/1997. If one counts the number of keystrokes (including colons, slashes, letters, and blank spaces) that are necessary to type in this entire date and time combination, one obtains a total of two dozen and one (25) keystrokes. If we convert the above to the twenty-four hour military system, we will shorten the representation somewhat and obtain 10/13/1997, 224535. The military format does help a bit, since by eliminating the colons between the hours, minutes, and seconds, as well as all the letters and spaces needed for the p.m. and a.m. designations, the number of keystrokes required is now reduced to one and a half dozen (18), a savings of seven keystrokes altogether. By converting to the dozenal date format, however, we can further compress the form of the above date and time down to *11⚹5;⚹/11;#4685*, which leaves us with only a dozen and three (15) keystrokes. When one considers that we started out with fully two dozen and one (25) keystrokes to write the traditional non-military designation of the time and date, it is clear that the dozenal form is vastly more convenient, and it gives us a 40% (or nearly 4⚹ per gross) reduction in the number of keystrokes (and the corresponding amount of space) required to represent the same information. Not only does this permit an enormous savings of time and effort for secretaries and data entry personnel who frequently have to type long lists of dates and times into documents and computer data bases, but it allows for far more convenient, compact, and easy to read date and time indications on clocks and calendar watches.

To summarize, the extreme economy and convenience of the dozenal form for writing the date and the time should hardly be surprising when one considers the unique combination of advantages which only base twelve permits: First, the month is always represented by a single digit, second, the day of the month and the time of the day can be written as a single number with no spaces between them, and third, the dozenal divisions of a day are more compact and accurate than are corresponding conventional units of time. (For example, taking just the time part of the combined dozenal date and time given above, we have *;#4685*. This five digit number is less precise than the six digit number in the equivalent military time, and is, in fact, nearly three times more accurate!) It also goes without saying that all of the above advantages are just as significant whether one says dates and times out loud, writes them on paper, or types them into a computer. However, the benefits of the dozenal system

are most strikingly apparent when it comes to arithmetical operations involving dates and times. Conventional time and date indications with their awkward decimals have to treat all the different units of time: The year, the month, and the day, and the traditional subdivisions of the day: The hour, the minute, and the second, as if they were entirely separate unrelated units. If one counts them, this makes six different units of time in all! In the dozenal system, on the other hand, there are only two fundamental units of time, years and days. The other units of time, namely the months and the dozenal divisions of the day corresponding to the traditional hours, minutes, and seconds, are automatically derived from the two base units by the ordinary laws of dozenal arithmetic. Not only does this fact make arithmetic in the dozenal time format much easier, but it greatly facilitates operations with computer data bases since, for example, one needs only to define two data types instead of six! The only real difficulty when doing dozenal calculations with dates in the conventional Gregorian calendar is that of accounting for the different numbers of days in each of the traditionally designated months, as well as the occasional mathematical adjustments needed to deal with leap years[#].

Finally, with all the numerous advantages to the dozenal way of writing the date and time, one may ask, are any further simplifications possible? Yes indeed! Whenever the context is clear, one may delete the semicolon between the year and the month (writing, for example, *11⚹5⚹* instead of *11⚹5;⚹*)[10], and one may likewise drop the dozenal point between the day and time of day if no confusion will result, (e.g., writing *11#4685* in place of *11;#4685*)[11]. Such condensed numerical forms be ideal in serial numbers and for indicating dates on perishable food items.

ENDNOTES

[1] The society recommends using a semi-colon in place of a period as a means of distinguishing dozenal numerals from decimal ones. Because of the critical importance of avoiding any possible confusion between the two types of numbers in a test, the semi-colon is often written to the right of whole numbers *solely* to show that they are intended to be dozenal, even when no decimal point would be needed in the corresponding decimal form of the number. In this article, dozenal numerals will also be written in *italics* to distinguish them from decimals, which will be written in block print, in accordance with the recommendations in the Manual of The Dozen System.

[2] One may note that this potentially confusing practice when referring to units of time is common throughout the English language: Thus in military time one refers to the period from 0000 hours to 0059 hours as the "first hour of the day," the period from 0100 to 0159 hours as the "second hour of the day," and so forth. Of course, the extent of such a practice in the English speaking decimal world does not oblige us to imitate it in dozenal usage.

[3] In fact the latter practice is not without precedent since it parallels the convention that astronomers follow when they number dates in history according to the scientific *Julian Day Number*. The astronomer's *Julian Day Number* is a special kind of calendar which assigns a unique number to every day in history, not unlike a serial number on a boxcar. To facilitate

mathematical calculations, astronomers treat December 31 of any one year as January 0 of the following year whenever they need to convert calendar dates to Julian Day Numbers or vice versa.

[4] Of course, such a usage is purely notational and need not in any way imply that December should be considered the first month of the year. For all practical intents and purposes, we may continue with the time-honored tradition of beginning the year in January as long as we like.

[5] The astute reader will observe that in such a case one could theoretically drop the "1" in the dozen and write a "0" for the month of December if one assumed that when one carries the "1" it automatically "wraps" around the date and gets added to the year on the right hand side, and one could accordingly write the above date as *0/21/11*4* in the dozenal system, but such a practice, though mathematically possible, would be awkward and logically unmotivated, and we would still have a highly inconvenient format in any case.

[6] Just as the decimal years 1997 and 1998 can be abbreviated to '97 and '98, the corresponding dozenal forms of the years *11*5* and *11*6* can also be abbreviated to **5* and **6* respectively.

[7] The number of days in a year is close to two gross, six dozen, and five point three, that is, to *265;3*, so that one dozenth of that will tend to alternate between two and a half dozen and two dozen seven.

[8] These terms are defined as follows: *Duors* are one twelfth of a day or two hours in length. *Temins* are a twelfth of a *duor* or ten minutes in length. *Minettes* are a twelfth of a *temin* or fifty seconds in length. A *grovic* is one twelfth of a *temin* and is approximately equal to 4.17 seconds. (*Editor's Note:* A *grovic* is precisely equal to *4;2* seconds.)

[9] The Manual of The Dozen System uses the terms *edo*, *egro*, *emo*, and so on to refer to successive negative powers of twelve. Thus *edo* means 0;1 (or one twelfth), *egro* means 0;01 (or $^1/_{144}{}^{th}$), *emo* refers to 0;001 (or $^1/_{1728}{}^{th}$), while *edo-mo* designates 0;0001 (or $^1/_{20736}{}^{th}$).

[*] In a conventional time indication giving the time to seconds, the resulting accuracy will be of order ± (plus or minus) a half second, which is one part in $(2)(24)(60)(60)_{ten}$ days or (approximately equal to) 5.787 037 037 E-6 days in decimal notation. On the other hand, in a dozenal time indication giving the time to twelfths of a grovic, that is, to five figures to the right of the "dozenal or fraction" point, the resulting accuracy will be on the order of one part in $(2)(12^5)_{ten}$ or 2.009 038 786 E-6 (decimal), which is 2.88_{ten} or, in dozens, *2;*7* times better!

[#] In keeping with the principle of representing the last month of the year as the zero month of the following year, one can also quite logically represent the last day of any given month as the zero day of the following month, and in fact that is exactly what astronomers do when

(*Continued*)

they calculate the number of days between two dates (see endnote 3). Thus January *27*; (31) can also be written as February 0. By doing this, one can facilitate mathematical calculations. On the other hand, since in the latter case there is no consequent simplification in the form of a written date, such a convention need not concern us here. Furthermore, there is no inherent conflict or possibility of confusion if some publications refer to the same date as November *26*; (30) and others refer to it as December *0*; they clearly are referring to the identical date and no change in the calendar is implied by either usage. This issue, in contrast to the critical question of the numerical representation for the month of December, is just a minor notational matter. There is one interesting point that is worth noting, however, with respect to the two forms of the date shown just above: Since the month of December itself happens to be the zero month of the coming year, this means that when one takes a date such as *11*5;#/26* (November 30, 1997), and re-labels the month and day as December 0, one effectively transforms the last day of November of a given year into the zero day of the zero month of the next year. In other words, one has actually converted the dozenal date *11*5;#/26* into *11*6;0/00*!, or, decimally speaking, one might say that we converted 11/30/1997 into 00/00/1998!

[10] Such a practice can be justified on two accounts: First, it may be taken solely as a matter of convenience, in much the same manner as baseball fans will say that a certain batter is a "300" hitter rather than a "0.300." However, if one takes a year as a dozen months to begin with, and views all dates in history as being counts of months instead of counts of years, logically permissible in the dozenal base, there would never be any reason to have a fractional divider between the years and the months to begin with. From the second perspective, then, there is nothing ad hoc or logically unmotivated in such a simplification.

[11] If one drops the semi-colon between the day of the month and the time of the day, one is effectively measuring the passage of the days in terms of smaller units, just as when one conventionally speaks of two days as being "forty-eight hours." If one does choose to do this, however, one must take the precaution of insuring that the first two digits of the resulting number are reserved exclusively for the days of the month; otherwise it will not be possible to tell where the days end and the divisions of the day begin. This means that one must always remember to add a zero in front of the day of the month if the number for that day is less than "*do*" (that is, 01 through 0#), and if one writes the zero day in the month one must always write the zero day as 00 in order to avoid confusion. Thus 6;20 p.m. on December 31, 1997, would be written without semi-colons in the dozenal system as *11*61/0092*. This is about as compact a date as possible. □

THE DIGITS OF DUODECIMAL INTEGERS

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Introduction: In a recent issue of The Duodecimal Bulletin (see [2]), the late Charles Trigg presented a stimulating article on consecutive-Digit Duodecimal Integers. His love of numbers was indeed evident throughout this work as well as his many other fine contributions. The goal of my article is to extend his initial researches to include information concerning consecutive odd and consecutive even Digit Duodecimal Integers. In a somewhat different direction, we will also focus on those duodecimal integers whose consecutive digits in order of magnitude are in finite arithmetic and geometric progression.

CLASS I. The following duodecimal digits are consecutive, odd, and in order of magnitude we give the prime factorization for each integer in the class. See Table 1.

Table 1: Prime factorization for each integer with consecutive odd digits in order of magnitude

13	= 3x5	975	= 5x1#1
31	Prime	79#	= 7^2x1#
35	Prime	#97	Prime
53	= 3^2x7	1357	= 15x*#
57	Prime	7531	Prime
75	Prime	3579	= 3x11*7
79	= 3x27	9753	= 3^2x109#
97	= 5x1#	579#	Prime
9#	= 7x15	#975	Prime
#9	= 3x3#	13579	= 3x7x17x57
135	= 5x31	97531	= 37x2827
531	Prime	3579#	= 5^2x17##
357	Prime	#9753	= 3^2x1389#
753	= 3^2x7x15	13579#	= 15x95x11#
579	= 3x1*7	#97531	= 271x4681

One observes that there are 26 duodecimal integers in Class I. Of these, * are prime: 35, 57, 357, 579#, 31, 75, 531, #97, 7531, and #975. (See [1]). Meanwhile, 12 are *square-free* in the sense that none of these 12 is divisible by the square of any prime: 13, 79, 9#, 135, 579, 1357, 3579, 13579, 13579#, 97, #9, 975, 97531, and #97531. One of these has a prime factorization whose factors are consecutive primes: 13 = 3x5.

Furthermore, we note that there are two pair which are prime when read backwards as well as forwards (57 and 75; 579# and #975). Five pair are square-free in the same sense: 79 and 97; 9# and #9; 579 and 975; 13579 and 97531; 13579# and #97531. Finally one can demonstrate that every one of the integers in Class I is *deficient* in the sense that the sum of all the proper divisors of the number is less than the number.

Class II. The following duodecimal digits are consecutive, even and in order of magnitude. The prime factorization for each integer in the class is presented in Table 2.

Table 2: Prime factorization for each integer with consecutive odd digits in order of magnitude

24	= 2^2x7	468	= 2^4x35
42	= 2x5^2	864	= 2^2x217
46	= 2x3^3	68*	= 2x5x81
64	= 2^2x17	*86	= 2x3x195
68	= 2^4x5	2468	= 2^4x195
86	= 2x3x15	8642	= 2x4321
8*	= 2x45	468*	= 2x7x3*#
*8	= 2^7	*864	= 2^2x7x471
246	= 2x3^2x17	2468*	= 2x12345
642	= 2x321	*8642	= 2x54321

If one takes a few moments to observe the contents of Class II, the reader find 18 duodecimal integers. Of these, one is a prime power: *8 = 2^7. Another is equal to the sum of all its proper divisors and is styled a *perfect number:* 24 = 1+2+4+7+12.

Further reflection yields nine square-free integers: 8*, 68*, 468*, 2468*, 86, 642, *86, 8642, and *8642. We additionally secure two pair of square-free integers when read in either the natural or reverse order of the digits: 68* and *86; 2468* and *8642. One also finds a half dozen *abundant integers* in the sense that the sum of the proper divisors of the number exceeds the number (46; 68; 86; 246; *86; and *864). The remaining 11 are deficient.

Class III. The consecutive digits of the following duodecimal integers are in a geometric progression in the order they are written. In each instance, the common ratio of the digits is presented as well as the prime factorization in Table 3.

Class III consists of * duodecimal integers. One is prime: 421. Two are square-free: 842 and 931. The integers 1248 and 964 are abundant while the remaining 8 are deficient.

Class IV. The consecutive digits in the following duodecimal integers are in an arithmetic progression in the order they are written. We will group the integers in the class according

Table 3: Prime factorization of geometric progressions

A. Common Ratio = 3 139 = 3^3x7	B. Common Ratio = 0;4 931 = 27x37
C. Common Ratio = 2 124 = 2^2x37 128 = 2^3x37 1248 = 2^3x7x31	D. Common Ratio = 0;6. 421 Prime 842 = 2x421 8421 = 5^2x401
E. Common Ratio = 1;6 469 = 3^2x61	F. Common Ratio = 0;8 964 = 2^2x7^3

to the common difference of the digits as well as resolve each integer into its prime factorization. See Table 4 on page 13;.

Observe that Class IV consists of exactly 100 (decimally one hundred forty four) duodecimal integers. Of these, 19 are prime: 9*#, 12345, 789*#, 357, 579#, 147, 58#, 258#, 16#, 321, 987, 4321, *987, 54321, 7654321, #*98765, 531, #97, 7531, #975, and #61. Meanwhile, 71 are square-free:
345, 456, 567, 789, 89*, 2345, 3456, 4567, 6789, 789*, 89*#, 23456, 34567, 56789, 6789*, 123456, 234567, 456789, 56789*, 6789*#, 1234567, 3456789, 456789*, 23456789, 3456789*, 456789*#, 123456789, 23456789*, 3456789*#, 23456789*#, 123456789*#, 68*, 468*, 2468*, 135, 579, 1357, 3579, 13579, 13579#, 47*, 147*, 159, 26*, 37#, 432, 543, 765, #*9, 5432, 6543, 8765, 65432, 76543, 98765, 654321, 765432, 876543, *98765, 8765432, 9876543, 87654321, 98765432, *9876543, 987654321, #*9876543, *987654321, #*98765432, #*987654321, 642, *86, 8642, *8642, 975, 97531, #97531, 741, 852, 963, #85, *741, #852, 951, *62, and #73.

In three cases, the digits written in both the natural order and the reverse order produce primes: 12345 and 54321; 579# and #975; 16# and #61.

In 22 cases, the digits written both forwards and backwards yield square-free integers: 345 and 543; 567 and 765; 2345 and 5432; 3456 and 6543; 23456 and 65432; 34567 and 76543; 56789 and 98765; 123456 and 654321; 234567 and 765432; 56789* and *98765; 3456789 and 9876543; 23456789 and 98765432; 3456789* and *9876543; 123456789 and 987654321; 3456789*# and #*9876543; 23456789*# and #*98765432; 123456789*# and #*987654321; 68* and *85; 2468* and *8642; 579 and 975; 13579 and 97531; 13579# and #97531; 147* and *741; 159 and 951; 26* and *62; 37# and #73.

Table 4: Arithmetic progressions

A. Common Difference = 1

123 = 3^2x17	789*# Prime
234 = 2^3x35	123456 = 2x3x5x5867
345 = 5x81	234567 = 3*5x70#
456 = 2x3x8#	345678 = 2^2x#x#051
567 = 15x3#	456789 = 3x145x1107
678 = 2^2x17#	56789* = 2x57x5#75
789 = 3x7x45	6789*# = 5x13#447
89* = 2x5x*7	1234567 = 61x24207
9*# Prime	2345678 = 2^2x6*147#
1234 = 2^3x195	3456789 = 3x115*26#
2345 = 7x3*#	456789* = 2x17x1#x67x141
3456 = 2x3x68#	56789*# = 5x7^2x95x41#
4567 = #x4*5	12345678 = 2^2x12#x2*571
5678 = 2^2x147#	23456789 = 3x#x67x8#x205
6789 = 3x37x75	3456789* = 2x7x3#x#7x921
789* = 2x35x117	456789*# = 1*5x511x577
89*# = 85x107	123456789 = 3x15x237x15661
12345 Prime	23456789* = 2x1405x*2**7
23456 = 2x3x468#	3456789*# = 5x8113#447
34567 = 25x148#	123456789* = 2x7^3x#x17x20951
45678 = 2^2x5x7x471	23456789*# = 1281x1*4746#
56789 = 3x1#x#71	123456789*# = #x*07x16730*7
6789* = 2x33*4#	

B. Common Difference = -1

321 Prime	#*987 = 5^2x5867
432 = 2x217	654321 = 377x1937
543 = 3x195	765432 = 2x392817
654 = 2^5x25	876543 = 3x#x15x37x75
765 = 5x7x27	987654 = 2^5x5^2x18##
876 = 2x3^3x1#	*98765 = 13#x8197
987 Prime	#*9876 = 2x3^3x25x27x51
*98 = 2^2x285	7654321 Prime
#*9 = 3x3#7	8765432 = 2x6#x75995
4321 Prime	9876543 = 3x7x591x#6#
5432 = x7x471	*987654 = 2^5x5x15x6*4#
6543 = 3x3#x67	#*98765 Prime
7654 = 2^5x#x31	87654321 = #x9598*#
8765 = 15x611	98765432 = 2x;#x169#x3467

9876 = 2x3^3x21#	*9876543 = 3x17x1#x37x3#87
*987 Prime	#*987654 = 2^5x7x13#x5927
#*98 = 2^2x45x81	987654321 = 587x184*627
54321 Prime	*98765432 = 2x7^2x35x3#x107x117
65432 = 2x5x789#	#*9876543 = 3x95x1825x3005
76543 = 3x4#x617	*987654321 = #x51x#5x147x1921
87654 = 2^5x329#	#*98765432 = 2x5x1#x754#2#41
98765 = 17x617#	#*987654321 = #x10#9618158#
*9876 = 2x3^3x7x415	
C. Common Difference = 2	**D. Common Difference = -2**
135 = 5x31	531 Prime
246 = 2x3^2x17	642 = 2x321
357 Prime	753 = 3^2x7x15
468 = 2^4x35	864 = 2^2x217
579 = 3x1*7	975 = 5x1#1
68* = 2x5x81	*86 = 2x3x195
79# = 7^2x1#	#97 Prime
1357 = 15x*#	7531 Prime
2468 = 2^4x195	8642 = 2x4321
3579 = 3x11*7	9753 = 3^2x109#
468* = 2x7x3*#	*864 = 2^2x7x471
579# Prime	#975 Prime
13579 = 3x7x17x57	97531 = 37x2827
2468* = 2x12345	*8642 = 2x54321
3579# = 5^2x17##	#9753 = 3^2x1389#
13579# = 15x95x11#	#97531 = 271x4681
E. Common Difference = 3	**F. Common Difference = -3**
147 Prime	741 = 7x107
258 = 2^2x75	852 = 2x427
369 = 3^3x17	963 = 3x321
47* = 2x5x57	*74 = 2^3x13#
58# Prime	#85 = 5x241
147* = 2x#x91	*741 = #x#6#
258# Prime	#852 = 2x5*27
G. Common Difference = 4	**H. Common Difference = -4**
159 = 3x5#	951 = 1#x4#
26* = 2x5x31	*62 = 2x531
37# = 15x27	#73 = 3x3*5
I. Common Difference = 5	**J. Common Difference = -5**
16# Prime	#61 Prime

In Class IV, 16 are abundant (456; 3456; 23456; 45678; 123456; 123456789*; 654; 876; 7654; 9876; *9876; 987654; #*9876; *987654; #*987654; 246; *86; *864;) while all the remaining are deficient.

REFERENCES

[1] D.N. Lehmer, "List of primes from 1 to 10,006,721", reprinted by Hafner, New York, 1956.

[2] Charles W. Trigg, "Consecutive-Digit Integers", *The Duodecimal Bulletin* 63; Volume 32; Number 3; Fall 1989.

□

Jottings

Cort Owen of Alaska, member number 360; is our newest Life member. We welcome his interest. See excerpts from the more than one dozen pages that he sent to all Board members on pages 1#;-20;. Cort is one of our many members who discovered the advantages of dozenal counting and measuring on his own, unaware of the existence of our Society when he did so.

THINK TWELVE: Twelve = 10; = do

FROM THE EDITOR

LIFE MEMBER JERRY BROST OF POLK CITY, FL, MEMBER NUMBER 294, WROTE TO VICE PRESIDENT GENE ZIRKEL ON DECEMBER 1, 1993. THE TEXT OF HIS NEAT LETTER FOLLOWS:

Hi Gene,

It seems like a long time since I've written. I have moved once again. I am now an assessment counselor at a psychiatric hospital. Much of what I do is involved with rehabilitating alcoholics and drug addicts. There are a number of Twelve Step programs in wide use for treating chemical dependencies. The program was originally developed by Alcoholics Anonymous. There are Twelve Steps, Twelve Traditions, and Twelve Concepts of Alcoholics Anonymous. Everyone seems to have a different idea of why everything comes in dozens. Some say the Twelve Steps consist of six pairs of steps that go together. Others say there are four groups having three steps each. Others believe the steps should be worked in three groups of four, and others claim the steps are divided into two halves with six steps in each half! Undoubtedly much thought has been invested in constructing the steps to provide maximum versatility.

I have not received any Bulletins recently. The last one I have is number 70;. I have a lifetime membership to DSA. Please see that I keep receiving them.

I am presently working a phonetic language with a repeating base system of twelve. I will keep you posted on progress.

Sincerely,
Jerry Brost

ROBERT J. MCGEHEE WROTE TO PRESIDENT JAY SCHIFFMAN IN 1995 AND TO VICE PRESIDENT GENE ZIRKEL IN 1997. THE TEXT OF HIS LETTERS FOLLOW:

March 1, 1995

Dear President:

I just returned from a tour of duty in Africa with the U.S. Peace Corps. Now that I am back in the United States after a two year absence, I would like to renew my acquaintance with the Dozenal Society. I had written a letter to the society years ago but was too busy to follow up on it. I now have more free time, and more knowledge of mathematics, so I would desire to devote some of my spare time to the work of the Dozenal Society.

My interest in the dozenal system really hit home while I was working in the Comoros Islands. The local currency was tied to the French Franc by a fixed ratio, with one Comorian

Franc being equal to 50_{ten} French Francs. The local government printed bills in denominations of 500, 1000, and 5000_{ten} Comorian Francs. To make matters worse, because paper for printing the bills was expensive and in short supply, the government printed more bills in the largest denomination than it did in smaller ones. The unfortunate result of this was that if you got stuck with a 5000_{ten} note it was virtually impossible to find someone who could change it. Part of the problem lay in the mathematical improbability that someone else would happen to have on his possession at least five 1000_{ten} notes, which was made worse by the fact that the latter were relatively rare as well, when normally there would be a greater number of lower denomination bills than higher denomination ones in circulation. On some occasions it took over two dozen minutes, and a half mile of walking round trip, to find someone who had the correct change. Numerous times there simply was not enough time and I had to go into some store and purchase something fairly expensive that I was not in need of simply to obtain change, since the majority of the store owners were understandably either unwilling or unable to furnish change without a purchase. At other times people had to settle for incorrect change, or else the store owners would raise the price of an item just so that its price would be an even multiple of "5000"!

It then occurred to me, from my memory of what I had read about the dozenal system, that if I had been doing my work for the Peace Corps in a country where the dozenal system was employed, and the currency system has likewise been based on that system, with, say, bills in denominations of 600, 1000, 2000, 3000, 4000, and 6000, all of which are simple fractions of a dozen, I would probably never have had any difficulty securing change for any size bill, even if lower denominations happened to be in relatively short supply. This observation demonstrates that although some mathematicians will claim that it is arbitrary which number base, or radix, one uses, for practical purposes, especially in third world countries, the choice of which number base one uses plays a direct role in many inconveniences and the general misery which the inhabitants of these countries have to endure in their daily living. In the case of an inconvenient bases, such as base ten, financial losses due to lost sales because of the difficulty of making change in the decimal system can definitely impact the local economies of these countries.

Now that I have introduced myself, I would just like to repeat that I am eager to join the Dozenal Society and to contribute to its work as much as possible. I have some computer programming skills and a respectable knowledge of number theory, and have already developed quite a few mathematical tables in the dozenal system and in other bases for my own personal use. In addition to the usual information concerning membership dues and subscription costs for newsletters and other publications, I want to know the software you have available using the dozenal system. I trust that you already have some basic dozenal data base available, but if there are any new programs that need to be written, I would be glad to assist in the effort. Naturally I would also wish to secure a good dozenal calculator, particularly one that does base conversions to decimal, binary, octal, and hexadecimal formats, so you may send any product catalogues that you have. Finally, I would just like to say that I can read materials in Esperanto, and I would desire to know if there are any people currently residing in Arizona, or nearby in the southwest who are working on the dozenal system. Thank you very much. I look forward to hearing from you.

Sincerely yours,
Robert J. McGehee 349;
Flagstaff, AZ

[*Editor's Note:* It is a pleasure to have Robert join us. We are very interested in a calculator that performs computations in base twelve.]

January 5, 1997

Dear Gene,

I first want to thank you for responding so promptly to my letter in November and furnishing me with all the latest copies of the Dozenal Bulletin which I had not been receiving because of a little mixup at the post-office. A grossfold thanks for keeping me updated on all the activities of the society. You may have noticed a little innovation at the upper right-hand corner of the page (*Editor's Note:* The date of Robert's letter is written 11*5;0/5.): Because the dozenal system allows one to treat the months of the year as if they were merely dozenal fractions of the year it is possible to write the year and the date (i.e. the month) as one number, that is, a whole number of years plus a fractional part of a year; with such a convention January, which is the first month of the year, is actually represented as month zero. Although this change may initially seem slightly confusing (along the same lines that the next century will actually be the "twenty-first" century, even though we will only be in the "two-thousands"), in actuality it will undo an erroneous misnumbering of the months caused by our previous failure to utilize unique symbols for dek and el. The only other possible solution to the problem that I can think of would be to keep the traditional numerical indications of the months but then represent the December of the previous year as being the month zero of the following year, which would appear to have the same effect as christening the new year at the start of December rather than at the start of January! Either way, the innovation saves space in the writing of the date; naturally, the days of each month must still be written as a separate number from the rest of the date, and that is why to represent the fifth of January I have employed a slash between the month and the day as opposed to a dozenal semicolon. On the other hand, if I had wished to record the exact time I had written the letter in the dozenal system I could have written the traditional do-metric units, the duors, temins, and minettes, as simple dozenal fractions of the day after another dozenal semicolon, and thus saved even more space.

On another note, I am quite pleased to hear other people writing in to mention that it is in fact possible to count on one's fingers in the dozenal system by using ones knuckles, and that it is in fact far more efficient to do so than it is merely to count on one's whole fingers (actually four fingers and a thumb!). I generally prefer to start at the tip of my index finger and to count up to the base of my finger so that the tip of the next finger will be on "four", and so on, so that I am actually counting by groups of threes. Of course, I realize that I could also start counting across my fingers first and then go up to the next set of knuckles, so that I would be counting by groups of fours. It would be most interesting to see which systems of finger counting most of our readers prefer. Interestingly enough, there are quite a few other ways in which one can count to a dozen using parts of one's body: One way is to count the different joints in one's arm in a straight line going from the tip of one's index finger all the way on up to one's shoulder. In this manner, one proceeds by count-the three knuckle joints in one's index finger, then the wrist, the elbow, and the shoulder, to obtain a total of six; counting in this fashion on one's other arm leads one to a total of one dozen. Another way to obtain the number twelve is to count all the major joints in one's body: Thus one can begin on the right side and count "ankle, knee, hip, wrist, elbow, shoulder" to obtain a half- dozen different joints on one side and then apply the identical technique on the left side to yield a second half-dozen. In reality, our bodies are actually more compatible with the duodecimal system than with the decimal system, and do not forget that children's counting game in dozenland where one counts to a dozen by counting one's eyes, ears, and nostrils twice!

I realize time is at a premium, and hence I will conclude by inquiring about your copyright policy for articles which one publishes in your bulletin; for I often might wish to reuse articles that I submit to the dozenal journal in other publications. I would also desire some clarification on your "advice to authors" in issue 76;. It was mentioned that the manuscript be prepared on disk using the language **WordPerfect 5.1** in addition to a hard copy. My problem is that I only presently possess a Macintosh computer, so that even if I could secure a copy of **Word** for my computer, it would probably not be compatible with the computers you are using. When you specify that the width of a page should be 4.5 inches you do not mention which size font we are to utilize for articles submitted to the bulletin. At any rate, as you have probably noticed, there are numerous errors in this letter because my computer has not been working, so that I have had to switch to my electronic typewriter, and it may take time to repair my computer.

On a final note, before I risk going into a postscript, I almost neglected to mentioned that when I last surfed the internet, I ran into several advertisements for true dozenal calculators which enable one to employ a base twelve setting in addition to the more commonly known settings to permit calculations in the octal, binary, and hexadecimal systems. Unfortunately, I was hurried when I encountered these dozenal sites through the "Yahoo" search engine, and so I will have to go back to those sites again when I have more time to obtain precise information concerning the ordering of these calculators. Most likely these calculators with dozenal capabilities are used by customers in the wholesale business and in the packaging industry where dozens, grosses, and great grosses are regularly employed. I plan to further correspond regarding this.

Sincerely,
yours in dozens...
Robert J. McGehee 349;
Flagstaff, AZ

[*Editor's Note:* Robert's fine article entitled **Shortcuts for Writing Dates and Times in the Dozenal System** appears on Page 5.]

The following are excerpts from the one dozen four pages of good ideas that Cort Owen sent to every member of the Board of Directors. Unfortunately, we cannot print it in its entirety at this time.

Courtney B. Owen
4111 MacInnes Street
Anchorage AK 99508-5131
tel (907)562-3244, fax 562-3474
19 Aug 97

... I propose ... That a Dozenal Society of America Active Members List including mailing address, home &/or office phone, fax and e-mail numbers, and identifying life-members and fellows, and membership number or first year of membership be sent to all individual members ...

Here are some of the reasons why I think so:

... Local or regional chapters would be come possible.

... Research would be greatly strengthened through direct correspondence.

[*Editor's note:* Members see important request on page 4]

... The publication's name and date should appear on each page. In addition to helping librarians in charge of abstracts, this aids members who may wish to send copies of articles to local newspapers or to friends.

... [The Bulletin] should include, as a convenience to our members, a note giving the address for the DSGB's *Dozenal Journal*...

[*Editor's note:* see page 2]

THE FOLLOWING ARE NOW AVAILABLE FROM THE SOCIETY

1. Our brochure, free.
2. "An Excursion In Numbers" by F. Emerson Andrews. Reprinted from *The Atlantic Monthly*, October 1934, free.
3. *Manual of the Dozen System* by George S. Terry, $1.44.
4. Dozenal Slide Rule designed by Tom Linton, $2.88.
5. Back issues of the *Duodecimal Bulletin*, as available, 1944 to present, $7.20 each.
6. *TGM: A Coherent Dozenal Metrology* by T. Pendlebury, $1.44.
7. *Modular Counting* by P. D. Thomas, $1.44.
8. *The Modular System* by P. D. Thomas, $1.44. □

How Many Seconds Are There In a Year?

We know that there are twelve inches in a foot, twelve months in a year, twelve ounces in the Troy pound used by druggists and jewelers, twelve eggs in a dozen, but did you know that there are twelve seconds in a year? (Stumped? See page 21; for a clarification.)

DON'T KEEP THIS MAGAZINE

Do you discard your copies of the *Bulletin* after you have read them? Or do they gather dust on a shelf in your attic? Why not pass them along to your local library, or to a school library. Perhaps some nearby math teacher would appreciate a copy. You can also just leave them in a dentist's office or other waiting area.

Help spread the word!

(If you ever need a back copy, we'd be glad to help.)

ON THE MERITS OF DUODECIMALS

The following was excerpted from "Segment Number 17: Two Professors Offer Revolutionary Ideas", *All Things Considered*, National Public Radio (NPR)

ROBERT SIEGEL, Host: And I'm Robert Siegel. When you come right down to it, there are relatively few changes that so thoroughly reorient our thinking and change our bearings that they merit the label 'revolutionary.' So when we came across two men with just such revolutionary proposals, we thought they'd be worth your hearing. Each is motivated by a certain clarity of logic and each is opposed by the overwhelming weight of tradition. Two men with big ideas. Gene Zirkel, who teaches at New York State's Nassau Community College, wants us to abandon our number system, based on ten, and convert to a twelve-based, or duo-decimal, system. Professor Zirkel and other members of the Dozenal Society of America would have us count this way. One, two, three, four, five, six, seven, eight, nine, dek, el, do.

GENE ZIRKEL, Professor of Mathematics, Nassau Community College: Let's go back to the time of the French Revolution, when people realized that most of us were counting in a ten-based system but measuring in a twelve system. So the carpenters put twelve inches in a ruler, the bakers sold twelve donuts in a dozen, the grocer was selling food by the dozens, and people realized that if we counted and measured in the same units, life would be much simpler. The French set up a commission to investigate this, and weighed the two possibilities - should we change our measurements to ten, or should we change our counting to twelve? And a mathematician by the name of Joseph Lagrange was instrumental in convincing them to do it the wrong way.

RS: You mean, you say it was wrong to change other measurements to a metric system? They should have looked at all those twelves we were using and changed our counting system to that?

GZ: Right. It's very simple that we count in tens. By a biological accident, we happen to have ten fingers. The measurements, on the other hand, were devised by practical people who hated fractions, so the carpenter put twelve inches in his ruler because he could get the common fractions of 1/2, 1/3, and 1/4 without having any parts, so 1/2 of twelve is six, and 1/3 of twelve is the whole number four. You try to take 1/3 of ten, and you wind up 3.3333 forever.

RS: But what hope would there really be for introducing two other numerals and to having a system in which the number represented by *what we now call ten* or one and zero, would actually be a dozen rather than ten. I mean, isn't that asking for a degree of change which in theory might be a good idea but can't be accepted?

GZ: You sound like your great-great-great grandfather in Europe when the crusaders came back with these funny numerals we call Arabic numerals, and you had what you and I now use as 1,2,3,4,5,... and your ancestors were using I, V, X, and they said, 'Come on. What chance is there for change? No one is ever going to buy your numbers,' and, 'Your system has a number for zero? You must be crazy. Who needs a number for nothing?' You can't stop progress.

NO KIDDING?

Metric mayhem

Converting famous measurements to awkward decimal metrics

1. Robert Frost—"kilometers to go before I sleep"
2. Erskine Caldwell— "God's Little Hectare"
3. Shakespeare—Shylock demanding 454 grams of flesh
4. Ernie Ford—"14.51 Metric Tonnes and What Do You Get"
5. Jules Verne—"96,000 Kilometers Under the Sea"

Source: Dinosaur Plots, Leonard Krishtalka, Wm. Morrow, 19896 □

A clarification to **How Many Seconds Are There In a Year?** from page 1#;

January second, February second,... □

WHY CHANGE?

This same question was rife in Europe from the year M to MD, when the Hindu-Arabic numerals were steadily displacing the comfortable and familiar Roman numerals then used. Yet, though it took D years, and despite much opposition —*Who needs a symbol for nothing?* — the easier notation became popular. Freed of the drag of bad notation, thinking leapt forward dramatically. Using this new dimension in symbolism, people discovered that it better accommodated mathematical exposition and facilitated the development of ideas. Re-examining their fundamental concepts of numbers, they made advances in arithmetic, algebra, logarithms and calculus, and thus contributed to the explosion of thought which later became known as the Renaissance. In a related development, they became aware that various number bases were possible.

A parallel to today seems tenable. The notation of the dozen base better accommodates mathematical statement and facilitates ideation. It, too, is a step forward in numerical symbolism. The factorable base is preferred for the very same advantages which led the carpenter to divide the foot into twelve inches, the baker and the grocer (one who deals in *grosses*) to sell in dozens, the chemist and the jeweler to subdivide the Troy pound into twelve ounces. And yet, this is accomplished by such simple means that students in the primary grades can tell why twelve is better. Literally, the decimal base is unsatis**FACTOR**y because it has **NOT ENOUGH FACTORS**.

Should we change? Yes, but no change should be forced, and we urge no mandated change. The world counts in tens. But people should learn to use dozenals to facilitate their thinking, computation and measuring. Base twelve should be a second mathematical language and should be taught in all schools. In any operation, that base should be used which is easiest, and best suited to the task. We expect that duodecimals will progressively earn their way into general popularity because they simplify the all-important problem of the correlation of weights and measures, the expansion of fractions (1/3 = 0;4) and give an advantage in calculations involving time and our twelve-month calendar. Perhaps by the year 2000, (or maybe by 1200; which is 14; years later!) duodecimals may be the more popular base. But then no change need be mandated, because we will already be using the more convenient base.

If "playing with numbers" has at times fascinated you, if the idea of experimenting with a new number base is intriguing, if you would like to be an adventurer along new trails in a science which some have falsely thought staid, established and without new trails, then whether you are a mathematician of international reputation, or merely an interested lay person who can add, subtract, multiply and divide, your membership in our Society may prove mutually profitable, and is most cordially invited. □

--------DETACH HERE-- OR-- PHOTOCOPY --------

YOU ARE INVITED TO JOIN THE DOZENAL SOCIETY OF AMERICA
The only requirement is a constructive interest in duodecimals

Date___/___/___

Name ____________________________________
LAST FIRST MIDDLE

Mailing Address (including full 9 digit zip code)

____

____

____

Phone:Home ______________ Business ______________

Fax ______________ E-mail ______________

Business or Profession ________________________

Annual Dues .... $12.00 (US)
Life .... $144.00 (US)
Student (Enter data below) .... $3.00 (US)
(A limited number of free memberships are available to students)

School ________________________

Address ________________________

Year & Math Class ________________________

Instructor ______________ Dept. ______________

College Degrees ________________________

Other Society Memberships ________________________

Kindly select one of the following:

____ To facilitate communication I permit my name, address & phones to be furnished to other members of our Society.

____ I do not wish my name, address & phones to be communicated to other members.

Please include on a separate sheet your particular duodecimal interests, comments, and other suggestions.:

Mail to: Dozenal Society of America
%Math Department
Nassau Community College
Garden City, LI, NY 11530-6793