EXTREME NUMBER NAMES

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The logological investigation of number name patterns and limits, surprisingly, is not a milked cow. We present thirty-two clusters of mostly new twists on number names that are most extreme in various contexts—order, length, magnitude, etc. It's in quiz form with answers at the bottom of each page. Answers are limited to the number names given in Web-3 under "number", which include zero and naught, but no negatives. Unless noted otherwise we count “hundred” but don’t count “and” in calculations of numbers like 111. We apologize to the creative logologists who may have found any of these number name extremes previously but aren’t recognized here.

1a. What are the shortest and the longest number words and number names, cardinal and ordinal?
1b-c. How many longest number names are there? Of that number, which are lowest and highest?

2. Count all the cardinal number names spelt with a given number of letters. 2a. What are the smallest and largest numbers that equal the group size they’re in? (Example: 22 is in a group of 22 having nine letters.) 2b. What are the smallest and largest group sizes containing the same number of members as letters? (Negative example: 4, not 3, number names have 3 letters.)

1a. Cardinals: Shortest word & number: one, six, ten (3 letters; six and ten by actual width).
   Longest word: quattuordecillion (17 letters)
   Longest number name (continuously named, ie, excluding centillion):
   Seven hundred seventy seven vigintillion,
   seven hundred seventy seven novemdecillion,
   seven hundred seventy seven octodecillion,
   seven hundred seventy seven septendecillion,
   seven hundred seventy seven sexdecillion,
   seven hundred seventy seven quindecillion,
   seven hundred seventy seven quattuordecillion,
   seven hundred seventy seven tredecillion,
   seven hundred seventy seven duodecillion,
   seven hundred seventy seven undecillion,
   seven hundred seventy seven decillion,
   seven hundred seventy seven nonillion,
   seven hundred seventy seven octillion,
   seven hundred seventy seven septillion,
   seven hundred seventy seven sextillion,
   seven hundred seventy seven quintillion,
   seven hundred seventy seven quadrillion,
   seven hundred seventy seven trillion,
   seven hundred seventy seven billion,
   seven hundred seventy seven million,
   seven hundred seventy seven thousand,
   seven hundred seventy seven. (758 letters)
Ordinals: shortest words and numbers: first, third, fifth, sixth, tenth.
   Longest word and number: same as cardinals + -th. (19 and 760 letters)

1b. Ignoring letter width, swap any of the 44 cardinal (first 43 ordinal) sevens above with threes or eights, producing 3⁴⁴ cardinals (3⁴₅ ordinals) of 758 (760) letters: 3 combinations per 44 (43) independent slots.

1c. Lowest: replace all 44-43 sevens with threes; Highest: replace all 44-43 sevens with eights.
3. With what number of letters are the most cardinal number names spelt?

4. What are lowest, highest, shortest and longest number names, cardinal and ordinal, whose letters are in alphabetical order? In reverse alphabetical order?

5. What are the smallest and largest numbers containing their own Roman numeral?

6. What are the first and last cardinal number alphomes in alphabetical order? (Alphomes are the letters of a word put into alphabetical order, eg, 8 = eight.)

7. What are the lowest and highest digits and cardinal and ordinal numbers in alphanumeric value (scoring each letter as its alphabetical position, eg, Z=26)?

8. In average alphanumeric value per letter, what are the densest and thinnest number names for one, two and three digit numbers?

9. Which cardinal numbers’ alphanumeric values equal the numbers themselves, or come closest, counting or not counting “hundred” and “and”?

2a&b. Smallest: four is in a group of four numbers having four letters (0 4 5 9)—a double coincidence.

   Or disallowing zero, thirteen is one of thirteen numbers having eight letters.

2a. Largest: thirty-five numbers have ten letters, including thirty-five, the only other case.

2b. Largest: six are spelt with six letters (11 12 20 30 80 90), the only zero-less case.

3. This one may be unanswerable without a supercomputer, barring some shortcut solution. The long number from Q#1 with 758 letters isn’t the answer, despite its astronomical size (922 members), for the next largest (757-letter) group contains a trans-astronomical 5422 members! (2 independent positions * per 22 independently variable denomination numbers where 738 swap with 459 one at a time (32=9) + a position where 20 swaps with 30-40-50-90. This adds up to 2+4=6 times the 9 per row in 758, or 54.) If 757 is not the largest it is nevertheless probable that the largest group will lie amongst the all-denomination numbers.

4. Cardinals, in order: forty (the only case, noted by Anil in a Kickshaws quiz, and probably previously)

   Cardinals, in reverse order: one (the only case)

   Ordinals, in order: first (the only case; none in reverse order)

5. Cardinals: fiVe; Ordinals: fIst (the only cases of each, five being well known)

6. First: AAAB + 12C, 57D, 171E, 1G, 67H, etc. (same huge number as in Q#1 but with all 44 sevens replaced by threes).

   First of a single number word: ACDEIILNOQRTTUU (quattuordecillion).

   First of an everyday number word: ADHNOSTU (thousand).

   Last alphome alphabetically: OTW (two), last in all three categories.

7. Lowest value digit and number: one (34) for both. Highest value digit: seven (65).

   Highest value number words: quattuordecillion (216) and quattuordecillionth (244).

   Highest value numbers: as in Q#1 above, sevens only, no threes or eights (total value 9595 and 9623).

8. Densest: Cardinal: two (58+3=19.33), sixty (97+5=19.4) and two twenty-two (223+12=18.58).

   Ordinal: sixth (80+5=16.0), twenty-sixth (187+11=17.0), and two twenty-sixth (245+14=17.5).

   Thinnest: Cardinals: eight (49+5=9.80), fifteen (65+7=9.29), one hundred and eight (176+18=9.78).

   Ordinals: eighth (57+6=9.50), eightieth (91+9=10.11), one hundred and eighth (184+19=9.68).

9. Two hundred and fifty-one=251, two hundred and fifty-nine=259 and one four six=146 are the only perfect matches. (First two results already known.) Several come within one of self: one three eight=139, one nineteen=120, two twenty-two=223, two hundred and nineteen=218, two hundred thirty-three=254, two hundred and thirty-one=231, two hundred and eighty-two=283, two hundred and eighty-four=285, two hundred and ninety-three=294. Due to the close alphanumeric values of two, three and four (58/56/60) three numbering styles have triplets coming within four of self: two twenty-two-four (=223/221/225), two hundred fifty-two-four (=256/254/258), two hundred and eighty-two-four (=283/281/285).
10. What are the lowest and highest alphanumeric values shared by two or more cardinal words?

11. What are the smallest, shortest, largest and longest cardinal and ordinal number names which contain their own alphanumeric letter within their spelling? Example: twelveLoe contains the 12th letter, L. Which contain their alphanumeric self-letter twice? Thrice?

12a. What are the lowest, shortest, highest and longest numbers that can be spelled with only the odd or with only the the even letters of the alphabet?
12b. Which alternate odd and even letters of the alphabet or vice versa?
12c. Which are confined to the first or the second half of the alphabet?

13a. What are the lowest and highest number names that zigzag up and down the alphabet or v.v.?
13b. Which zigzag between the first and second half of the alphabet or v.v.?

14a. What are the lowest, shortest, highest and longest number names that zigzag between the left and right hand half of the keyboard or v.v.?
14b. Which are confined to the left or right hand half of the keyboard?

15. Ambidextrous number names contain a first portion ("half") from the left half of the alphabet or keyboard, the rest from the right. 15a. What are the lowest and highest alphabet-ambidextrous number names, cardinal and ordinal? 15b. What are the lowest and highest keyboard-ambidextrous number names? (These are more literally ambidextrous than the alphabet case.)

(others: seven=fifteen=65, eighty=undred=74, forty=million=84, twelve=ninety=87, seventeen=trillion=octillion=109, nonillion=duodecillion=123, septillion=sexdecillion=131)

   Smallest ordinal: eighth. Shortest: ninth. (other cases: eight, twelve, fourteenN, Twenty)

12a. None of either occurs, cardinal or ordinal, surprisingly, unless you count nth. (Discussed in 13-295)
12b. Cardinals: Lowest: zero. Shortest: one. Highest and longest: ninety-nine—or [nine ninety-nine], n, n being indefinitely large if denominations are omitted. (other cases: 5, 9, 10, 11, 90)
   Ordinals: first (the only case)
12c. First half: none (unless you count half). Second half: two. (the only integral case; no ordinals)

   Ordinal: Lowest and shortest: fifth. Highest and longest: twelfth. [with stutter, octillionth]
   Ordinals: none

   Ordinals: eighth and eighty-eighth (other cases: cardinals: eight, eighty; no other ordinals).

   Ordinals: first (the only case; other cardinals: 4, 8, 40, 42, 50, 52, 80, million)
   Longest: sexdecillion, two nonillion and tredecillion (12 letters each).
   Ordinals: none. (Other cardinals: hundred, two million, billion, trillion, sextillion, decillion.)
16a. What are the lowest and highest vowel/consonant-ambidextrous numbers (first part all vowels, rest all consonants, or vice versa), cardinal and ordinal?

16b. What are the shortest, lowest, highest and longest banananames (number names that alternate vowels and consonants)?

17a. What are the longest and largest number names that don’t repeat a letter?

17b. What are the lowest and highest that don’t contain the letter E?

18. What is the last digit to make its first appearance in pi?

19. Four is well known as the only cardinal number truthful in number of letters per name. What are the lowest, shortest, highest and longest truthful ordinal numbers?

20. Drawn in sans serif capitals, what are the lowest and highest number names that are truthful in:
   a) number of straight lines, allowing (but not counting) curved lines and hyphens?
   b) number of end-points? (Negative example: ONE has not 1 but 5: 2 on the N, 3 on the E.)

21. Half the lower case alphabet is tall letters (bdghijklpqty), half short (acemnorsuvwxz). What are the lowest and highest number names of all tall letters? All short letters? Alternating the two?
22a. What are the lowest and highest number words having no rhyme in the M-W Rhyming Dict.?  
22b. What numbers have the most apt rhymes? This one of course is subjective.

23. What is the shortest word composed only of the initials of all the digits except zero?

24a. Which eight number names are spelled only with the initial letters of other number words?  
24b. What are the smallest and largest numbers that can be made as acrostics of the eight?

25. What are the shortest single non-numeric words in Web3 containing the letters of each digit?

26a. What are the lowest and highest number words with non-numeric anagrams, allowing phrases and proper names or not?  
26b. What number word has the most Web-3 single-word anagrams?  
26c. What are the lowest and highest number words with an ostrich anagram (first or last letter[s] ‘buried’ inside or moved to the opposite end)?  
26d. Which number words can charade into a phrase (same letter order, different spacing)?  
26e. Which number words have a reversal?

22a. Rhymeless Cardinals: Lowest: sixty. (others: seventy, ninety)  Highest: hundred. (Thousand rhymes with adwovson. Any -illion word rhymes with civilian, pavilion, etc.)  
Ordinals: Lowest: sixth. Highest: thousandth (which like -illionth rhymes with month, but isn’t listed.)  
22b. Cardinals: Mathematically the most apt number name rhymes:  
eight = Duplicate, duplicate, duplicate. [or] Quadruplicate, duplicate. [or] Quadruplicate, bifurcate, quadruplicate. [or] Quantitate: enumerate, duplicate, replicate, reiterate. (et cetera)  
six = brick’s arithmetics (6-sided)  three: “Wee fleur-de-lis be me tree.” / [3rd] degree / ABC  
two = too, redo (also, twice); twos = shoes; one first-run; un (same word in dialect, a self-rhyme).  
Chemically the most apt rhymes: seventeen = chlorine (its atomic number); nine = alkaline (pH 9).  
Other fun rhymes: Eighty weighty, twenty plenty. (eg, classroom size—or girl’s waistlines!);  
Ten men sin when gin been in.  
Ordinals: first – erst (oldest, former), worst (antigram); third = surd (antonym, not irrational);  
tenth = nth, strength (on 1-10 scale)  
23. SOFTEN — which charades to “S. of Ten,” signifying System of Ten, the decimal system.  
24a. The eight are one, second, seven/th, ten/th and seventeen/th.  
24b. Acrostics, smallest & largest from each: (Answers exclude “hundred(th)” except as a terminal word.)  
ONE = One Ninety-Eight & One Novemdecillion Eighty.  SECOND = Sixty-Eight Centillion  
One Ninety Decillionth & Seventy-Eight Centillion One Ninety Duodecillionth.  
SEVENTH = Sixty-Eight Vigintillion Eighty Nonillion Two Hundredth & Seventy-Eight Vigintillion Eighty Novemdecillion Three Hundredth.  
TEN = Two Eighty-Nine & Thirty-Eight Novemdecillion.  
TENTH= Twenty-Eight Nonillion Two Hundredth & Thirty-Eight Novemdecillion Three Hundredth.  
25. froze > zero (how apt!); con=one; owt/tow/wot=two; ether/there=three; furor > four; fervid/verify > five; XIs = (or axis =) six; evens=seven; height/weight > eight; ennui/inner/linen > nine.  
26a. Word anagrams: Cardinal lowest: one (eon); highest: octillion (cotillion), thousand (handouts).  
Ordinal lowest: first (rifts); highest: eighth (height).  
Highest making phrases: Cardinal: centillion (Ill, not nice.); Ordinal: centillionth (I’ll con it then.).  
26b. Most word anagrams: two (owt, tow, wot), or, counting prefixes, one (eno-, eon, neo-, noe-, oen-).  
Every combination of one’s letters is listed in W3, although noe- is not a separate headword.  
26c. Ostrich word anagrams: Cardinal lowest: two (tow) or one (nee-); highest: octillion (cotillion).  
The only Ordinal: eighth (height).
27. What are the lowest and the shortest number names that contains all 23 letters found in English number names excluding zero? (All but J K Z. Counting zero there is no integral number containing all 24 letters, unless eg 101 be called one zero one.)

28a. What are the lowest and shortest number names that include all the modern Roman numerals IVXLCDM? 28b. What is the largest number name containing no Roman numerals?

29. What are the number word and the number name with the highest total from adding together all the Roman numerals in their names? (eg, eleven has L + V = 55)

30. What are the smallest and largest Arabic number names evenly divisible by, or into, the sum of their contained Roman numerals? Either A/R or R/A is an integer. Example: thirty-six = I+I+X = 12 which goes evenly into 36 (A/R = 36/12 = 3).

31. What are the smallest and largest Arabic number names, cardinal and ordinal, evenly divisible by, or into, the product of their contained Roman numerals (A/R or R/A is an integer)? Exclude I’s as neutral hence trivial. Example: sixty = (I)x=X=10 which goes evenly into 60 (A/R = 6).

26c. Ostrich phrases: Cardinal lowest: four (of Ur); highest: centillions (Scent ill ion.) [detect a dangerous contaminant]. Ordinal: none. (?)

26d. Chardes: Cardinal lowest: seven (7’s even), forties (for ties); highest: nonillion (Non-ill, I. On’/.

Ordinal: first (Fir St.) (The only example, if you’ll even count this one.)

26e. Reversals: Lowest: one (eno’), six (XIs) or ten (net). Highest: duodecillion (No ill iced oud.). [Nothing bad eliminated the oud, its player or its concert.] Note that nonillion is almost a palindrome, and quattuordecillion was palindromed in Nov.’14 Kickshaws. Ordinal reversals: (none)

27. Lowest: one octillion, one septillion, one quadrillion, one billion, one million, two thousand five hundred sixty-eight/th (1,001,000,000,001,001,001,002,568/th).

Shortest: one octillion, two septillion, five quadrillion, six billion, eighty million/th.

28a. Lowest with all the Romans: Cardinal: one octillion, one million, one hundred sixty-five. Ordinal: one octillion, one million, five hundred sixth. Shortest: one octillion, five million, six hundred/th.

28b. Highest with no Romans: forty-four/th.


Number: the same long number as in Q#1 but with all sevens and seventies replaced by sixes and sixties (total 34,300: 110 I, 2 V, 68 X, 40 L, 10 C, 57 D, 2 M). A higher result still (Dx22 = 11,000 more = 45.300) would result if “and” were added to each 666.

Ordinals: add -th to the two cardinal answers (values unchanged).

30. Cardinals: Smallest: eleven = L+V = 55 which is divisible by 11 (R/A = 5).

Largest we found: three novemdecillion, five hundred twenty-six octodecillion (3526 followed by sixty zeroes) = 1M+4D+3C+4L+1X+2V+61 = 3526 which goes evenly into 3 novemdecillion, 526 octodecillion (A/R = one octodecillion).

Ordinals: add -th to the two cardinal answers.

31. Cardinals: Smallest: five = IxV = 5, which is divisible by 5 (R/A=A/R=1)—the only selfie.

Largest A/R: nine hundred ninety-nine vigintillion, nine hundred ninety-nine novemdecillion, nine hundred ninety-nine octodecillion, nine hundred ninety-nine septendecillion [MxD11xC4xL8xV3] = 4.76837158203125x10^55 which goes evenly into 9,99999999999x10^55 (A/R = 20,970,150,200). It’s possible, even probable, that a larger answer with more 999s—perhaps even the full 66 9’s of the largest enumerable Web3 number (1000 vigintillion – 1)—would give an even R/A, but the horrendous task of long division on paper deterred our trying. Pocket or standard computer calculators can’t help here.

Ordinals: Smallest: second = CxD = 50,000, R/A = 25,000. Largest: add -th to the cardinal answer.
32. Finally an etymology question: which digits and which other number words are least and most modified over their oldest known roots, mostly Indo-European, measured: a) as % of root word letters altered or dropped or not in place in the English word; b) as % new letters in the English word. We skip modern synthetic higher-illion words as too recent to be of much interest here.

32. Digits: Cardinals, least changed: a) three (I-E trey, trí), 25-33% changed; b) one (I-E oinos), 33% new; but both a and b are equalled or bettered by the 25% for nine (I-E newn) if you count the out-of-place e. Cardinals, most changed: a) five (I-E penkwe), 83.3%; b) eight (I-E oktou), 80% new.

   Ordinals, least changed: a) third (I-E trí, trey), 0% of trí changed, allowing the historical -ri- > -ir-metathesis (33% otherwise, which is still least changed unless you count the t in seventh, making I-E sept- least changed at 25%, but the t in -th is secondarily added, not truly retained); b) third, 40% new over trí, again counting -ri- = -ir-.

   Ordinals, most changed: fifth (I-E penkwe) = both a (100% changed) and b (100% new).

Other numbers: least: a) million (L. mille), 20% changed; b) thirty (I-E tri+tig), 33% new;

   most: a) fifty (penkwe+tig), 89% changed; b) eleven (oinos+lif) = eighty (okto+tig), 83% new.

From all these studies, the number name two emerges as the most multiply extreme. In alphabetical order it's the last digit and the last alphome of any sized number as well as the driver of the last number alphabetically (bar zero). It's the only number exclusively from a single half of the alphabet. It's the densest digit alphanumerically. It has the most anagrams of any number (excluding prefixes). And two and twos both have apt rhymes. It also has the minor distinction, not noted above, of being the highest number that is truthful in number of lines when written cursively.

Among the ordinals, first is foremost. It's the only one whose letters are in alphabetical order; the only one containing its own Roman numeral (I); the shortest word along with fifth based on letter width; the only ordinal alternating odd and even letters of the alphabet; the only alphabet-ambidextrous case (First); the lowest lacking an E; the lowest and one of only two with a selfie rhyme (erst), the lowest with an anagram (rifts); and the only one with a charade (First).

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