

WORD SUMS (NO CARRYING!)

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The simplest form of arithmetic that we all learn in grade school is addition. Each of us has spent countless hours over problems like $123 + 456 = 579$.

There are several ways to do the same thing with words. For example, Cryptarithms (or Alphametics) are puzzles where letters have been substituted for the digits in an arithmetic problem. Most people have seen such puzzles as $SEND + MORE = MONEY$ in which one substitutes digits for letters to obtain a valid arithmetical sum. Numerous books of such puzzles have been published; see the November Word Ways for the review of a recent one by Steve Kahan.

The Word Sum is a form of word addition closer to the spirit of Word Arithmetic. In Word Sums, each letter has its natural value, namely A=1, B=2 through Z=26. The letters in the Word Sum are added in each column. If the sum in a column is greater than 26 it is reduced by 26. That is, after Z you wrap around to A again. For example, T+R is $20+18$ or 38; this is reduced by 26 to 12 or L. There is no carrying from one column of the sum to another. (When carrying is allowed, one has Base 27 addition as discussed in the May 1993 Word Ways by Lee Sallows.)

The sum $ABAFT + OCCUR = PEDAL$ can be set up as

ABAFT	1	2	1	6	20
OCCUR	15	3	3	21	18
PEDAL	16	5	4	1	12

Using the Merriam-Webster Pocket Dictionary (1994 edition), there are 705 such sums using five-letter words. Using a larger dictionary, of course, would result in many more. Some of the sums form amusing phrases, or even complete sentences:

ADULT + FEAST = GIVEN
 AMEND + JADED = KNISH
 APPLY + ROBIN = SERUM
 BLAZE + FIRST = HUSSY
 BOOST + MOOSE = ODDLY
 CHASE + PITHY = SQUAD
 CINCH + PEARL = SNOUT
 CLOSE + DITSY = GUILD
 FETCH + MOULD = STOOL

FORCE + MECCA = STUFF
 FOUND + METAL = STOOP
 INLAY + TARDY = CODEX
 KNOCK + SATIN = DOILY
 MOTEL + SWUNG = FLOSS
 SNIPS + TACKY = MOLAR
 TWIST + THICK = NERVE
 WEDGE + SPLIT = PUPPY

In some cases the words are remarkably related:

ARENA + HOGAN = IGLOO
MIAMI + PLANE = CUBAN

PHONY + VAGUE = LIVID
SENSE + SPORT = LUCKY

including one amazing pair of sums:

HOLLY + SKIFF = AZURE

HOLLY + TWIST = BLUES

Here are a few other five-letter Word Sums I liked for various reasons:

GIANT + MIZEN = TRASH
GROSS + VIOLA = CADET
INERT + JUICY = SINUS

LAYER + ANVIL = MOUND
MODEL + STAIR = FIEND
RAYON + SHORE = KINGS

Moving on to six-letter words, the Word Sums become a good deal rarer. Four of them used abbreviations; I list the remaining 51:

AFRAME + OUTSET = PALTRY
AGHAST + SHEAVE = TOMBOY
AMULET + UNHOOK = VACATE
ANIMUS + GAIETY = HORROR
ANTHEM + CURSOR = DILATE
ANYONE + LASCAR = MORROW
ASLANT + SOFTEN = THURSH
ASSIGN + BOVINE = CHORUS
BAUBLE + SOUGHT = UPPITY
BRANCH + PIMPLE = RANDOM
BREEZE + CAYMAN = ESDRAS
BRONCO + KINDLY = MACRON
BRONZE + CANDOR = ESCROW
BRONZE + CANTER = ESCHEW
BUSILY + UNLESS = WIENER
CAUGHT + ROUBLE = UPPITY
CAVEAT + INSIDE = LOONEY
CAYUSE + INSIST = LORDLY
CHARGE + HAMLET = KINDLY
CHILLI + TACTIC = WILFUL
CLOVEN + EOCENE = HARASS
CORDON + PAWNEE = SPORTS
DANGLE + INFEST = MOTLEY
DEMODE + WIGWAM = ANTLER
DENGUE + SCULPT = WHISKY
DESPOT + WAMBLE = AFFRAY

DIMITY + WIGWAM = ARTFUL
DISARM + PRINCE = TABOUR
DREDGE + LIMPET = PARTLY
DROWSE + OCCULT = SURREY
ELICIT + OFFICE = TROLLY
EMETIC + REVOKE = WRAITH
FLOPPY + LOOSEN = RADIUM
FRIDAY + MIKADO = SATEEN
GANTRY + INDUCT = POROUS
GARDEN + INTENT = POLISH
GENIUS + TARIFF = AFFRAY
GRIPPE + KITSCH = RACISM
HERETO + SHAGGY = AMSLAN
IMMURE + TRENCH = CERIUM
LINNET + TRUDGE = FAIRLY
LISSOM + WETHER = INMATE
MANIOC + UNABLE = HOOKAH
MEDDLE + VIRAGO = INVEST
MINION + URGENT = HAUNCH
ODDITY + RANSOM = GERBIL
PREFIX + ZINNIA = PASTRY
SALVER + VAGINA = OBSESS
SLEEVE + WORKER = PAWPAW
UNHOOK + WALLET = ROTATE
VOLUTE + WEIGHT = STUBBY

With a word length of seven letters, there are only four possible Word Sums in this dictionary:

CRINKLE + MARXISM = PSALTER
OSMOSIS + SHARPEN = HANGING

PIGSKIN + WRESTLE = MALLEUS
PLACEBO + ROMANCE = HANDSET

There are no Word Sums in the Pocket Dictionary using two eight-letter summands or addends. In order to get to longer words it is necessary either to use a larger dictionary, or to use more than two summands. I chose the latter course since the number of combinations is much higher, so that more solutions would be likely, and it is more likely to produce solutions longer than eight letters.

Using the Pocket Dictionary with three eight-letter summands there are 195 possible Word Sums. None of them formed particularly interesting phrases, or involved four related words. The following 27 seemed the best of the lot:

ARTIFICE + QUANTITY + ACTUALLY = SPORADIC
 AIRSPACE + DECEDENT + MUSICIAN = RINGWORM
 ALEHOUSE + DRUNKARD + DIPSTICK = IMPOTENT
 ALPHABET + ELEPHANT + MEMORIAL = SCHMALTZ
 SHIPMENT + ALTHOUGH + SURPRISE = MOUNTING
 ARMYWORM + JUNCTION + RETARDED = CRUCIBLE
 MANDOLIN + OVERVIEW + ARTISTIC = COMEDOWN
 BESMIRCH + CHEYENNE + CHEYENNE = HUCKSTER
 SUDANESE + TRIMMING + BIRDBATH = OVERCOAT
 DIPSTICK + LEGATION + BUILDING = RIFFRAFF
 CHANUKAH + ILLUMINE + STRINGER = ENERVATE
 DESOLATE + VARIABLE + CICERONE = CONCERTO
 PRECIOUS + VIBRATOR + CONQUEST = OPULENCE
 VIGILANT + DERRIERE + HANDBILL = HOMEWORK
 DISUNITE + POLITICS + INVITING = CLAMBAKE
 HEIGHTEN + PREMOLAR + DOMINION = BLACKOUT
 DUTIABLE + RELATIVE + WELLNIGH = SERVITOR
 PARAKEET + TORTOISE + DYESTUFF = NOONTIDE
 EVALUATE + INTEGRAL + TERRAPIN = HOMICIDE
 GUNPOINT + FISHBOWL + SATURDAY = FEASIBLE
 PLEASING + GENETICS + PRACTICE = MITIGATE
 REABSORB + PERVERSE + HEADGEAR = POTBELLY
 REASSIGN + PREMOLAR + HOUSEFLY = PLAYMATE
 HUNTRESS + MANEUVER + RELEVANT = MANDIBLE
 LAMBASTE + MUSTACHE + TICKLISH = SEIGNEUR
 LUKEWARM + PRESSING + UNDERCUT = WATCHMAN
 SANCTION + VENGEFUL + THRUSTER = INTERIOR

Proceeding to nine-letter words, there are only three combinations that work. They are:

IBUPROFEN + INFLATION + LORGNETTE = DESIGNING
 INCLEMENT + MINCEMEAT + TURPITUDE = PRIESTESS
 REPULSION + SUBDIVIDE + TRIENNIAL = ERADICATE