

ALPHAMETICS FOR TEN-DIGIT SQUARES

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Among the nearly 70,000 ten-digit numbers representing the squares of 31,501 to 99,381, inclusive, only 87 consist of unique digits, i.e., contain all ten digits 0 through 9. A list of these 87 squares is given by T. Charles Jones in the article "Squares with 9 and 10 Distinct Digits" published on pp. 62-63 of the Journal of Recreational Mathematics 1 (1968). Only 27 of these 87 numbers are the squares of five-digit numbers which likewise consist of unique digits.

An interesting problem is to search for ten-letter words that can be used to represent the ten-digit numbers -- each letter standing for a different digit -- and which contain five-letter dictionary words that can be spelled by taking the five digits and their corresponding letters in the proper order. As an example, suppose we select the ten-digit square 2913408576 and represent it by the word BREAK-DOWNS. The corresponding square root is 53976. If the letters in BREAKDOWNS corresponding to these five digits are taken in the order 5-3-9-7-6, we find the word WARNS.

Not all of the ten-digit numbers are easy subjects for such alphametics, but twenty-six of them are listed below with solutions that are more or less satisfactory. I was not able to find a solution for the number combination 1532487609 - 39147. Perhaps some reader will be more successful.

1237069584 - 35172

ANTICHORUS - TRAIN
PASTICHEUR - SEPTA
SECTIONARY - CASTE

1436789025 - 37905

DISEMBARKT - SMART
POLYANTHUS - LATHS
VETCHLINGS - THINS

1927385604 - 43902

DESOLATING - GLENS
OUTWALKING - GAUNT
UNSHACKLED - DANES

2170348569 - 46587	CORNFIELDS - IDLER BASKETWORM - TROWS GYMNOPLAST - PSALM
2913408576 - 53976	ANTIFOULER - LINER PORCELAINS - ICONS UNPOLISHED - HONED
3015986724 - 54918	BREAKDOWNS - ASKED CONFIGURAL - FLING CONTRA WISE - TERNA
3285697041 - 57321	MENDACIOUS - DIMES THWACKINGS - AITHS UNIMPROVED - MOUND
3412078569 - 58413	RHEUMATOID - OTHER SPECULATOR - TAPES UNTROWABLE - BANTU
3528716409 - 59403	SCENOGRAPH - CHAPS SIPHUNCLED - IDLES TARSONEMID - ADMIT
3719048256 - 60984	ANGLESMITH - HELMS CINGULATED - DUGAL WYKEHAMIST - THEMA
3975428601 - 63051	AFTERHOLDS - LADES NEUROPHAGY - ANGRY RUDIMENTAL - TRAIL
3985270641 - 63129	ASTHENOPIC - PACES CNIDOBLAST - ACTON PSEUDIMAGO - APODS
4832057169 - 69513	BOUNTIHEAD - ADIEU MULTIPHASE - SEPAL UNSOBRIETY - TYRES
5803697124 - 76182	CLAMOURIST - ROILS
6154873209 - 78453	ANELYTROUS - TYLER CUEMANSHIP - NAMES DICTAPHONE - PATCH

6457890321 - 80361	ATMOSPHERIC - SERAC NEIGHBORLY - HORNY NIGHTWARDS - TARNS
6714983025 - 81945	AROUNDIGHT - DONUT WHENABOUTS - BEANS
7351862049 - 85743	CENSURABLY - UNCLE STACHYDRIN - HAS IT TRIGLYPHED - LITER
7408561329 - 86073	CHARLESTON - REACT
7680594321 - 87639	POSTNEURAL - SPORE PRATINCOLE - APRON UNFOLIAGED - FUNGI
7946831025 - 89145	MOSANDRITE - NORSE PANHYGROUS - YARNS PRECARIOUS - ARIES
8014367529 - 89523	ANTHEROIDS - ASIDE CHRYSTILE - CEILS SEMAPHORIC - SCRIP
8127563409 - 90153	TRIMENSUAL - LARES WATERBLINK - KNARL
8326197504 - 91248	FRIGHTABLE - THIEF LITHOMARGE - MOTEL SYNCOPATED - PONDS
8391476025 - 91605	LACUSTRINE - CURIE LIFEGUARDS - FEARS SCRAPINGLY - RANGY
9351276804 - 96702	COUNTERSPY - CREPT SEMILUNARY - SNURL SHETLANDIC - SNAIL

The relationship between ten-letter and five-letter words might be indicated by such statements as:

A grower of VETCHLINGS always THINS them.
 Conservationists object to the DESOLATING of GLENS.
 A search for old PORCELAINS may uncover interesting ICONS.
 UNPOLISHED quartz can be HONED smooth.

There is RHEUMATOID arthritis and the OTHER kind.
A SPECULATOR often watches ticker TAPES.
Most florists will ADMIT that a TARSONEMID can be a problem!
A WYKEHAMIST must always have a THEMA.
A RUDIMENTAL TRAIL may not be easy to follow.
In England, the admonition "If you drink, don't drive" would involve both UNSOBRIETY and TYRES.
A SERAC results partly from ATMOSPHERIC conditions.
Lancelot's AROUNDIGHT could easily slice a DONUT.
STACHYDRIN - the plant Stachys HAS IT.
Most UNFOLIAGED plants are called FUNGI.
A trip to ARIES would be PRECARIOUS.
No WATERBLINK could ever have a KNARL.
Products made of LITHOMARGE are often found in a MOTEL.
LIFEGUARDS at beaches lessen the FEARS of beginning swimmers.
The COUNTERSPY CREPT silently through the underbrush.
No SNAIL would be able to speak SHETLANDIC.