

ANSWERS AND SOLUTIONS

Receptive Words

S. Kahan

1. PANES: WANES / PINES / PAVES / PANGS / PANEL
2. GRASS: BRASS / GLASS / GROSS / GRABS / GRASP
3. PRONE: DRONE / PHONE / PRUNE / PROBE / PRONG
4. FACES: PACES / FECES / FAZES / FACTS / FACET
5. SHORE: CHORE / SWORE / SHARE / SHOVE / SHORN
6. BOOTS: ROOTS / BLOTS / BOUTS / BOOKS / BOOTY
7. HARES: BARES / HIRES / HATES / HARPS / HAREM
8. BASES: OASES / BUSES / BALES / BASKS / BASED
9. SLICK: CLICK / STICK / SLACK / SLINK / SLICE
10. BULLY: FULLY / BELLY / BURLY / BULKY / BULLS
11. SHEER: CHEER / STEER / SHIER / SHEAR / SHEEP
12. CASTS: FASTS / CYSTS / CARTS / CASKS / CASTE

BONUS: CANTER: BANTER / CENTER / CASTER / CANCER / CANTOR / CANTED

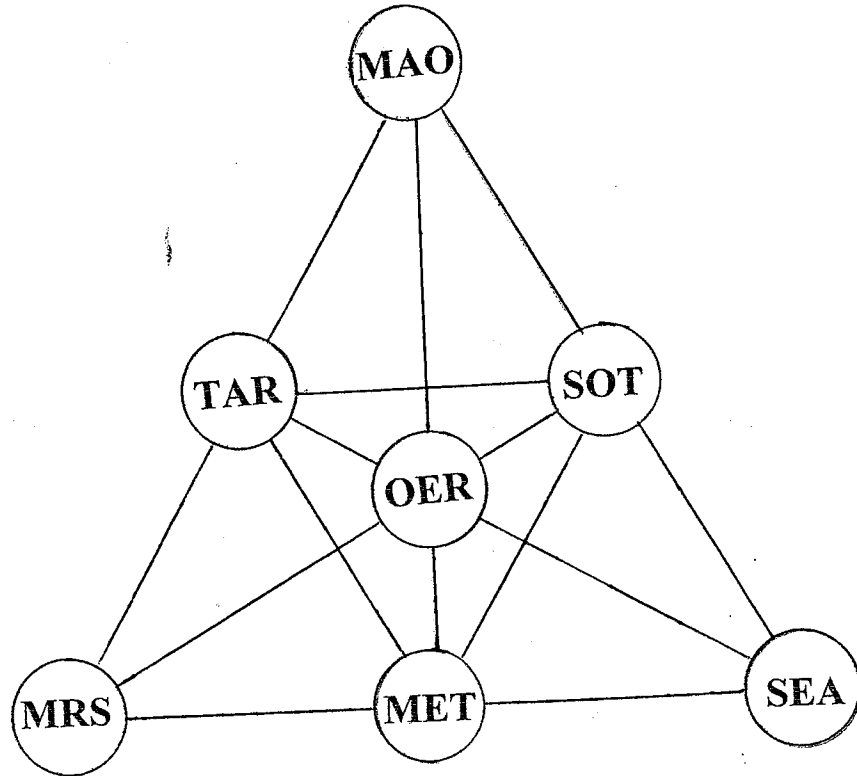
The Story of a Puzzle

Anil

There are at most eleven mistakes. Ten are misspellings: slory, ot, cf, stroy, thc, stovy, fhe, stcry, stony, tha. The eleventh is the omission of "of" at the beginning of the 9th line from the bottom.

Back Cover The "Maestro" Puzzle
One answer to "Maestro" is

J. Farrell



This is equivalent to Fano's order 2 Projective plane.

Look Close

All the words can be split thusly: dose = close

H. Jacobs

A TRIBUTE TO "ARMAND T. RINGER"

1914 - 2010

Jeremiah Farrell

NOTES

- 34 (Across) TOE is the "Theory of Everything"
- 47 (Down) CAA - see internet
- 47 (Down) Using the letters of "maestro" for the seven nodes and the seven words as the lines this becomes Fano's projective geometry
- 10 (Down) is essentially a losing nim for Ace
- 18 (Down) Hewlett Packard
- 39 (Down) Hal in "2001"

1	2	3	4		5	6	7	8		9	10	11	12	13	
W	I	L	L		U	R	A	L		M	T	I	D	A	
14					15					16					
P	A	L	O		T	O	F	U		O	R	S	O	N	
17					18					19					
A	N	D	T		H	A	T	I	S	T	H	E	H _E	E _G	N _G
					20										
					P	H	A	N	T	A	S	Y			
21	22	23	24			25				26	27	28	29		
S	T	A	T	S		T	I	R	E		S	L	A	B	
30						31				32					
T	R	E	E		S	I	T	E		T	W	I	C	E	
33						34				35					
P	E	R	T		T	O	E		P	A	I	N	E	D	
	36				37				38						
	M	A	R	T	I	N	G	A	R	D	N	E	R		
39									40					42	
H	O	T	A	I	R		E	D	O		N	A	B	S	
43															
A	L	O	H	A		44				45					
						R	O	D	S		E	G	I	S	
46						47				48					
L	O	R	E		C	A	M	I		E	R	E	C	T	
					49	50				51					
					D	I	A	M	E	T	E	R			
52	53	54									55	56	57	58	
Y	O	U	R	L	A	S	T	I	S	A	H _T	E _A	A _I	D _L	
59											61				
E	N	R	O	L		60				E	R	D	A		
62															
R	E	I	N	S		63				64					
						S	Y	N	E		E	Y	E	D	

A Tribute to "The Mathemagician"

The next-highest number that is the sum of its cubed digits, after 370, is, of course, 371. The number 370 read upside-down with a Spanish accent is OLE.

The classic version of this problem is to find numbers that have the same number of digits as the exponent. Thus, there are only three four-digit numbers that are the sum of the fourth powers of their digits. Can you find them? (See Second Answers.)

The Internal Bisector Problem is extremely difficult to prove using the classical theorems of Euclid, though it can be done. A brief solution is possible using the more advanced type of proposition that mathematicians call a *lemma*. A lemma is a proposition that is assumed to be true for the time being, in the course of proving another proposition. In this case the lemma first assumes that the triangle is *not* isosceles, then goes on to show that this leads to a contradiction, proving that the assumption must be false. A sample of this type of proof for the Internal Bisector Problem, known as the Steiner-Lehmus theorem, may be found in H. S. M. Coxeter and S. L. Greitzer's *Geometry Revisited* (Random House, 1967), pages 14–15. I thank Victor G. Feser, assistant professor of mathematics at Mary College, Bismarck, North Dakota, for calling this reference to my attention.

The seven magic feats described here, and hundreds of others, may be found in Gardner's *Encyclopedia of Impromptu Magic*, published by Magic, Inc. (5082 N. Lincoln Ave., Chicago, 60625).

1. Anyone can produce a tiny puff of "smoke" from an "invisible cigarette." Keep your mouth tightly closed, and by pressure of the mouth and cheeks compress the air inside your mouth as much as possible. Then open your mouth and let the air drift out. Under the right humidity conditions, the sudden expansion of the air causes it to condense and produce a small cloud of vapor.
2. A 50-cent piece under the tablecloth absorbs the cigarette's heat so that the cloth doesn't get hot enough to burn or be scorched.
3. A bit of earwax on the end of the match does the trick.
4. The distance from the right side of the shield on the eagle to the right margin of the bill is 1 inch. *United States* at the top of the green side is 2 inches wide. The rectangle containing the words *Federal Reserve Note* at the top of the bill's face is 3 inches wide. The bill itself is $\frac{3}{16}$ inch longer than 6 inches; eliminate one margin and you come very close to a 6-inch rule.
5. Hold the watch flat, pointing the hour hand toward the sun. Imagine a line running from the center of the dial through a point midway between the hour hand and 12. This line will point due south. If the time is before six in the morning or after six in the afternoon, this line points north instead of south. If you are south of the equator, these rules are reversed.
6. Hold a raw, unpeeled potato in the left hand and a straw in the right, between the thumb and middle finger, with the index finger covering the end of the straw. With practice, it is possible to drive a paper straw completely through a potato. A quick, straight thrust does it; the column of air trapped in the straw keeps it momentarily rigid enough to cut through the potato.
7. To remove a vest without removing one's coat, first tuck the left side of the coat into the left armhole of the vest from outside. Work the armhole over the left shoulder and down over the arm and hand—the hole will then circle the coat in back of the left shoulder. Work the hole toward the right shoulder, and pass it over the shoulder, around the hand, and right side of the coat. Push it halfway down the right side of the coat. Reach up the sleeve, seize the vest and extract it through the sleeve.

Hofstadter's title, "Metamagical Themas" is an anagram of "Mathematical Games."

Second Answers

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"The Mathemagician"

The three numbers that are the sum of the fourth powers of their digits are 1,634; 8,208; and 9,474. Interested readers may find this problem generalized to n digits in Martin Gardner's *The Incredible Dr. Matrix* (Charles Scribner's Sons, 1976), pages 31 and 205–209.

CHARADES

ACROSS

- 1 Famous Nazi
- 5 The opposite of not lose
- 9 Engrave
- 10 Hep
- 11 Dies ---
- 12 Comic strip dog
- 13 Walk-out of "Born Free" star caused upheaval
- 15 New Zealand fort
- 16 Presider over inmate's mess
- 22 Frenzied
- 23 Space
- 24 Skirt type
- 25 Hawk's foe
- 26 Playing fields site
- 27 French river

DOWN

- 1 Linage link
- 2 French verb
- 3 Strike breaker
- 4 Ram's relative gets diploma
- 5 Deceive Oliver? Very rash!
- 6 Against
- 7 Tell --- the marines!
- 8 Crazy as a ---
- 14 Long.'s companion
- 16 Arrived
- 17 Elide
- 18 That's a ---
- 19 Heard at some games
- 20 Indiana's art work
- 21 Arab prince

R	E	S	I		N	O	L	E
E	A	O	G		I	N	I	N
H	O	O	H		K	O	K	V
E	T	H	V	L	S	N	O	C
			H	V				
N	O	I	T	T	E	R	E	R
O	L	L	O		E	V	H	I
O	L	N	O		H	C	L	E
T	I	V	R		S	S	E	R

1	2	3	4		5	6	7	8
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26					27			