46	48	37	58	16
~~24~~ 21	54	47	~~49~~ 39	44
33	36	27	52	59
32	50		35	45
73	17	61	~~18~~	43

205 − 152 = 53 205 − 114 = 91 205 − 98 = 109

36 205 − 182 = 23 205 − 162 = 43

205 − 144 = 61 205 − 172

$A+B=178$

$C' = 54$

$A = E$

$D+F-B=54$

$A=89,\ B=89,\ C=54.$

$E=89,\ D=71,\ F=72$

$D+F-89=54$

$D+F=143$

143 − 89 = 54

46, 54, 27, 35, 43

73, 50, 39, 16

~~$a=33,\ a'=56$~~

~~$b=32,\ b'=57$~~

~~$e=41,\ e'=48$~~

~~$d=62,\ d'=9$~~

~~$f=70,\ f'=2$~~ $c = 26$ –

~~$c=26,\ C'=28$~~

71 − 14 = 57 ... 4

43 + 46

73 + 16

54 + 35

50 + 39

71 − 9 = 62

39

46	a ~~33~~	~~32~~ b	~~26~~ c	16
d ~~62~~	54	e	~~39~~	f
g ~~47~~	h	27	i	~~48~~ j
~~70~~ k	50	l	35	~~9~~ m
73	~~56~~ n	~~57~~ o	~~28~~ p	43

$a+b+c=143$ ✓

$d+e+f=86$ ✓

$g+h+i+j=178.$

$k+l+m=120$ ✓

$n+o+p=89.$

$d+g+k=86$ ✓

$a+h+n=101$

$b+e+l+o=178$ ✓

$c+i+p=131$

$f+j+m=146.$

205 − 27 = 178 205 − 85 = 120

205 − 116 = 89

205 − 119 = 86 51 + 33 + 23 = 107

205 − 104 = 101 205 − 74

205 − 59

$k+m=84$

$l=36$

48

10 eqns between 16 quantities

86 Put a, b, c, d, e, f.

28

$a=45,\ b=47,\ c=51$

$d=26,\ e=31,\ f=29$

$g+k=60$

$i+p=80$

$j+m=117$

$g=32,\ k=28$

$i=33,\ h=23$

~~$j=$~~

$j=$ ~~60~~ $61,\ m=$ ~~57~~ 56

$l=36.$

$o=64$

47 + 31 + 36 + 23 = 137

178 − 114 = 64

131 − 51 = 80

146 − 29 = 117

p. 472 – paper on same subject by A. E. Whitford.

p. 482. J. C. Duncan – Prominences & sunspot cycle – Reference to Kodaikanal Observatory

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p. 499. P. C. Keenan – Point-source model with constant opacity – diff. eqn of Chandrasekhar – von Neumann integrated numerically – Ref. to Chandrasekhar's book

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p. 526. B. Strömgren – Physical state of interstellar hydrogen – Discovery of Struve & Elvey of regions in Milky Way showing emission H-lines.

Comptes Rendus U.S.S.R. Vol 22, No. 1 (1939).

p. 7–11, Gelfand & Kolmogroff – ~~Cont~~ Rings of continuous functions on topological spaces – defn of topological ring.

No 2, p. 59 – Vinogradow – Improvement of his method

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p. 64–75 – Articles by Federov & others on Biophysics – retina sensitivity

(81)

46	a	b	c	16
d	54	p	39	d'
e	r	27	s'	e'
f	50	p'	35	f'
73	a'	b'	c'	43

$205 - 62 = 143$

$a+b+c = 143$

$a'+b'+c' = 89$

$\checkmark\ a+r+a' = 101$

$\checkmark\ c+s+c' = 131$

$\checkmark\ b+(p+p')+b' = 178$

$d+e+f = 86$

$d'+e'+f' = 146$

$\checkmark\ d+p+d' = 112$

$\checkmark\ f+p'+f' = 120$

$\checkmark\ e+(r+s)+e' = 178$

$205 - 116 = 89$, $205 - 104 = 101$, $205 - 74 = 131$

$205 - 119 = 86$, $205 - 27 = 178$

$205 - 59 = 146$

$205 - 93 = 112$, $205 - 85 = 120$

$p = 23,\ r = 58$

$q = 63,\ s = 47.$

$A+B+C = 232$

$D+E+F = 232$

$A+C+R = 232$

$B+P = 178$

$D+F+P = 232$

$B = R$

$E = P$

$E+R = 178$

~~B = 91, R = 87~~

~~E = 90, R = 88~~

89

$B = 87,\ P = 91$

$R = 87,\ E = 91.$

$\cancel{A+C = 141}$

$\cancel{D+F = 142}$

$A+C = 145$

$D+F = 141$

~~B + P + E + R~~

~~2B + 2E = 178~~

$A = 63,\ C = 82.$

$D = 82,\ F = 59$

$a+b+c = 143$ | $d+e+f = 86$

$a'+b'+c' = 89$ | $d'+e'+f' = 146$

$a+a' = 43$ | $d+d' = 59$

$c+c' = 84$ | $f+f' = 57$

$b+b' = 62$ | $e+e' = 73$

$178 - 116 = 62$

$101 - 58 = 43$, $131 - 47 = 84$

$112 - 53 = 59$

$120 - 63 = 57$, $178 - 105 = 73$

$232 - 91 = 141$

$101 - 38 = 63$, $131 - 49 = 82$

$120 - 61$, $112 - 30 = 82$

$143 - 82 = 61$

$b = 37,\ b' = 50,\ r = 38,\ r' = 49.$

~~c = 52, c' = 29~~

$e = 31,\ e' = 60,\ p = 30,\ p' = 61$

A = 63	D = 82	P = 91
B = 87	E = 91	R = 87
C = 82	F = 59	

~~a = 40~~ 41, a' = ~~23~~ 22

b = 42, b' = 48

c = 41, c' =

a = ~~24~~, 68

34, 29

41, 19, 41

$a = 41,\ a' = 22$

$b = 32,\ b' = 55$

$c = 70,\ c' = 12$

$b = 37,\ b' = 50$

$c = 65,\ c' = 17$

$d = 42,\ d' = 40$

$e = 19,\ e' = 72$

$f = 25,\ f' = 34$

$e = 31,\ e' = 60$

$f = 72,\ f' = 57$

$p = 30,\ p' = 61$

$r = 38,\ r' = 49$

24/6/39 : J de Phys et le Rad. t. 10. May 1939
p. 209. Proca & Goudsmit – On the mass of elementary particles – Purely classical theory (using special relativity), the fundamental hypothesis being that the movement of elem. particles are governed by geodesics on a space having additional coordinates defining "charge" and "spin. The mass is explained as "quantity of matter", charge & spin. Theory explains diff. between proton & neutron, Fermi's theory, mesotron theory

Int

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p. 229. U. Fano – Decomposition of heavy nuclei into two of intermediate weight – explanation of Hahn's expt on disintegration of Uranium on general theoretical grounds.

Ann. der Phys. Bd. 35, H. 3. p. 272. G. Molière – Quantum theory of Rontgen-interference in Crystals

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Ap. J. May 1939. p. 467. J. D. Williams – Determination of stellar diams – by diffraction effects at time of occultation by moon.

$a = 41,\ a' = 22$ | $d = \cancel{54}\ \cancel{51}\ 53,\ d' = \cancel{38}\ \cancel{34}\ 29$ | $p = 30,\ p' = 61$

$b = 37,\ b' = 50$ | $e = 31,\ e' = 60$ | $r = 38,\ r' = 49$

$c = 65,\ c' = 17$ | $f = \cancel{11}\ 2,\ f' = \cancel{48}\ 57$

					205
46	41	37	65	16	205
53	54	30	39	29	205
31	38	27	49	60	205
2	50	61	35	57	205
73	22	50	17	43	205
205	205	205	205	205	205

After all - what a colossal amount of labour to solve a stupid problem. It has been a case of "try & try again" in spite of what poor Frierson has mentioned on p. 129 of Andrews. But Frierson has done it only for up to $n = 4$ & he has mentioned

on p. 137 that squares of larger dimensions do not seem to be reducible to laws on account of their complexity. In fact it is this damned complexity that has taken so much time

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J. I. M. S - Vol. 10, No. 5, (1918), p. 446, Q. No. 924

S. Malhari Rao _ Complete the following pan-diagonal Bears (?)

21				
	30			
		1		
			7	
				13

Mathiesson (in Acta. Phy. Pol. 6, 356, 1937).

Zs. f. tech. Phys.: Zwanzigster J. Nr. 4 (1939) p. 126 — Notice of Jubilee volume in list of new books

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Zs. f. Ap. Bd. 18, 2 Heft. p. 98. Mc Crea — observable relations in relativistic Cosmology II

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p. 116. Jehle — Second paper on Wave mech in Ap

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p. 124. N. R. Sen — Pressure relations in interior of stellar bodies

---

p. 132 — Problem of star chains by E. Holmberg — A star chain is a sequence of 3 or more stars of about same app. ~~mag~~ brightness and arranged at equal distances along a st: or slightly curved line. No physical connection but deduction possible from probability

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Soln by R. J. Pocock & Sadanand

234
94
140

4	0	2	5	1
2	5	1	4	0
1	4	0	2	5
0	2	5	1	4
5	1	4	0	2

(A)

4	3	2	1	5
1	5	4	3	2
3	2	1	5	4
5	4	3	2	1
2	1	5	4	3

(B)

~~(C) has repeated~~ ~~& is not a valid soln~~

24	3	12	26	10
11	30	9	23	2
8	22	1	15	29
5	14	28	7	21
27	6	25	~~7~~ 4	13

(C)

Soln: The nos. given may be written as 20+4, 25+5, 0+1, 5+2, 10+3. Consider squares (A) & (B). Multiplying each term in (A) by 5 & adding to the corresponding term in (B) we get the required pandiagonal square (C).

This is Narayana Pandita's method — The square is not normal, but, nevertheless, the N-method holds.

Ibid, p. 451 — Q by Malhari Rao — Q. pro. 988

7	43	71	113
73	97	23	41

Complete the accompanying magic square by placing 8 other prime numbers in the vacant cells.

16 to 30

7, 23, 41, 71

Zs. f. Phys: Bd. 112, 1-2 Heft, p. 65. Hönl & Papapetrou - On self-energy and gravitational field of a point charge - no reference to my work

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p. 92. R. Fürth - on Gamma Fn

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ibid 3-4 Heft. p. 159. Watanabe - lighter nuclei

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p. 252 - Hilsch & Pohl - Photoelectric effect

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p. 256 - M. Blackman - Feinstruktur der Reststrahlen (Correction

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ibid. 5-6 Heft. p. 257. Th. Neugebauer - Quantum-mech. theory of the Cotton-Mouton effect

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ibid 9-10. Heft. p. 512. Hönl & Papapetrou - Über die innere Bewegung des Elektrons I - Again no references to my work - is a long paper with copious references to Lubanski &

This is related to my method of getting 4th order prime Jaina square but Makhani Rao wants only a prime magic square.

Soln p. 117 by Prof N. B. Mitra & several others.

$\boxed{S = 234}$ 248

7	43	71	113
154 − x	94 − y	48 − y	x + 2y − 62
x	y	92 + y	142 − x − 2y
73	97	23	41

(A)

Putting x & y in the first two cells of the 3rd row, it is easy to see that the remaining cells should be filled up as above. ~~Consider the diagonal 7, 94~~ For, 7, x, 43 ~~forces~~ gives 154 − x in 1st cell of 2nd row, giving 94 − y in second cell of 2nd row. Taking downward diagonal & upward diagonal sums we get the terms 48 − y & 92 + y. The only value of y ~~is 11 making~~ < 48 making 94 − y, 48 − y and 92 + y all prime is y = 11. Hence putting y = 11, (A) becomes

7	43	71	113
154 − x	83	37	x − 40
x	11	103	120 − x
73	97	23	41

x, 40 < x < 120 giving all 150 − x, x − 40, 120 − x primes are x = 53, 101, 107.
giving the 3 possible squares

Ib. Vol. 12, No. 4 (1920) solution given by K. B. Madhava, Jamuna Prasad Nigama, and

Rev. of Sci. Instr April 39, p. 115. Review of
Electromagnetics, A Discussion of
BK || Fundamentals by A O'Rahilly (Longmans Green
& Co, N.Y, 1938, Price $12.50 by E. U. Condon
who pays this revolutionary book a good tribute

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p. 116 – Review of the C.U.P. book on Matrices by
BK || Bateman

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p. 122. Intn to study of stellar structure by
BK || S. Chandrasekhar, Univ of Chicago Press,
Chicago, Illinois, $10.00 –
Review by Bethe – Rather a scathing
criticism of the book being too mathematical

BK || p. 124. Review of Tolman's book by Rabi
125. " Darrow's: Intn to Contemp. Physics
by Bainbridge
D. Van Nostrand Co, N.Y, – $7.00

K.D. Karve & M.K. Kewalramani by ~~saying that~~ giving the following three squares

7	43	71	113
A	83	37	B
C.	11	103	D
73	97	23	41

Where the corresponding values of A, B, C, D are

where A = 101, 53, 47

B = 13, 61, 67

C = 53, 101, 107

D = 67, 19, 13

Soln by Madhava et als is same as Mitra & others, although ~~the~~ K.D.M & others have not explained their method. The three cases are

7	43	71	113
101	83	37	13
53	11	103	67
73	97	23	41

(i)

7	43	71	113
53	83	37	61
101	11	103	19
73	97	23	41

(ii)

7	43	71	113
47	83	37	67
107	11	103	13
73	97	23	41

(iii)

(i) is of semi-Jaina type with all the 2×2 subsquares totalling to S=234, but it is not nasik. In fact none (except two)
of (i) – (iii) is nasik. But how did Melhani Rao arrive at the first & last row of his prime magic square. He must have got ~~the~~ at least one square & given it as a problem for solution.

7, 43, 71, 113, 73, 97, 23, 41 7 23 41

1, 11, 31, 41, 61, 71, 101, 131, 151, 181, 191, 211, –

3, 13, 23, 43, 53, 73, 83, 103, 113, 163, 173, 193,

7, 17, 37, 47, 67, 97, 107, 127, 137, 157, 167, 197, –

19, 29, 59, 79, 89, 109, 139, 149, 179, 199, 229, 239, –

p. 242. K. Fuchs – Stability of nuclei against β-emission – extension of work in Bethe-Bacher – thanks Born for taking interest in the paper – Read this

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Phys. ZS. 40 J – N. 5 (1/3/39)

" N. 6 (15/3/39) – Reviews of Hohensels, Kohlrausch's, Kowalewski's (Grosse Math), Riemanns, Scheffers, Blaschke-Bol's books

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" – N. 7 – Review of Kowalewski Higher math for Engineers

" N. 8 – p. 294–97. F. Matossi – Dispersion of ultrasonics in liquids – Ref. to B. V. R. Rao

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" N. 9, p. 337–52 – Papers on Molecular form and dielectric relaxation

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" N. 10, p. 366–84. P. O. Müller – Eigenschwingungen der zyl. u. sph. Welt.

If the numbers appearing in (i) are | in (ii) | (iii)

(i)	(ii)	(iii)
11, 41, 71, 101	11, 41, 61, 71	11, 41, 71
13, 23, 43, 53, 73, 83, 103, 113	23, 43, 53, 73, 83, 103, 113	13, 23, 43, 73, 83, 103, 113
7, 37, 67, 97	7, 37, 97	7, 37, 47, 67, 97, 107
	19	

~~7, 37, 43, 73~~. 7, 23, 47, 43, 71, 73, 97, 113

7, 11, 13, 23, 37, 41, 43, 53, 67, ~~73~~, 71, 73, 83, 97, 101, 103, 113

11, 41, 71, 101
13, 23, 43, 53, 73, 83, 103, 113

7, 37, 67, 97
11, 41, 71, 101
13, 43, 73, 103.
23, 53, 83, 113

7	43	71	113.
g	h	n	m
k	o	p	s
73	97	23	41

s + m = 80
~~h + n + h + o = 154~~
h + n + o + p = 234
n + p = 80

S = 234

✓ g + k = 154 ~~o + n + h~~
✓ s + m = 80 ~~n + p~~.

✓ h + p = 186, ~~h + n~~
✓ o + n = 48 ; o + h = 94 ✓
n + p = 140 ✓
g + m = o + p = 114
k + s = h + n = 120

186
83

g + m = 114 , g + k = 154
k + s = 120 , s + m = 80

~~g − s = 34~~
~~k − m = 40~~

114
73
41

80 = 1 + 79 = 7 + 73 = 13 + 67 = 19 + 61 = 37 + 43
48 = 11 + 37 = 7 + 41 = 1 + 47 = 5 + 43

(i) o = 11, n = 37, h = 83, p = 103,

s = 7, m = 73, g = 41, k = 113 s = 13, m = 67
g = 47, k = 107

7	43	71	113
47	83	37	67
107	11	103	13
73	97	23	41

This is (iii) on last page.

o = 1, n = 47, X, o = 5, s = 43 X

only choice ~~for s~~ is o = 11, n = 37.

why not o = 37, n = 11, h = 57 X

94
37
57

~~p = 140 47~~ = 93

114
61
53

p. 465. G. Temple – Relativistic Cosmology

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p. 529. McVittie – Obsn & theory in Cosmology

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p. 557. Review of Jubilee volume – Very short
" Tolman's book on Statistical mechanics
" Background to modern Science by Needham & Pagel
(C.U.P. 7s 6d)

Proc. Camb. Phil. Soc. Vol 35, Pt. 2

p. 186. Eddington – On Lorentz-Invariance –
said in personal talk at Sir Mirza's party that
he would think & write about it after he went home
obviously this is the result – note "Conversations with
Non-Physicists" – Is to be read thoroughly

p. 195. H. C. Corben – Uncertainty of reference frame
in quantum mechanics – tries to remove
difficulty of self-energy by above Consideration –
Read this very int. article

$o = 11,\ n = 37,\ h = \cancel{83},\ p = 103$; in fact these are common in (i) – (iii) on p. 85

$s + m = 80 \to s = 1,\ m = 79,\ k = 119\ \times$

$s = 19,\ m = 61,\ k = 101,\ q = 53$ ✓ this is (ii)

$s = 67,\ m = 13$ gives (iii).

So Grierson's "laws" governing 4×4 squares are not simpler than Mitra's ~~method~~ method — An

Anyway I don't know how Mathai Rao hit upon these squares. What about my nasik jaina squares? Suppose I take the top & bottom rows & proceed to find the square. Using Eq (iv), p. 127 of Note Book – 13, the ~~foot to top~~ top & bottom rows are as below. Using Mitra's method

59	541	67	593
$624-x$	$636-y$	$\overset{90}{\cancel{110}}-y$	$x+2y$ -110 → 90
x	y	$534+y$	$726-x-2y$
577	83	569	31

$S = 1260$

$1260 - 636 = 624$

$1260 - 624 = 636$

$636 + 59 + 31 = 726$

$1260 - 726 = 534$

$577 + 593 = 1170,\ 1260 - 1170 = \overset{90}{\cancel{110}}$

$\frac{1350}{\frac{90}{1260}}$ $\frac{1370}{\frac{1260}{110}}$ $\frac{1266}{\frac{534}{726}}$

$\frac{541}{\frac{83}{624}}$ 636 $\frac{624}{\frac{83}{541}}$ $\frac{652}{\frac{73}{579}}$ $\frac{624}{\frac{61}{563}}$ $\frac{28}{591}$

$\frac{90}{\frac{67}{23}}$ $\frac{541}{\frac{28}{569}}$ $\frac{90}{\frac{73}{17}}$ $\frac{521}{\frac{28}{493}}$ 531 4 6 $\frac{89}{\frac{652}{\frac{61}{591}}}$ 269

To find prime $y < \underset{96}{110}$ making $\overset{90-y}{110 - y}$, $636 - y$, $534 + y$ all prime

$y = \cancel{1}, \cancel{3}, \cancel{5}, \cancel{7}, \cancel{11}, \cancel{13}, \cancel{17}, \cancel{19}, \cancel{23}, \cancel{29}, \cancel{31}, 37, \cancel{41}, 43, \cancel{47}, \cancel{53}, \cancel{59}, \cancel{61}, 67, \cancel{71}, 73, \cancel{79}, \cancel{83}, \cancel{89}, 97.$

$\cancel{101}, \cancel{103}, 107, \cancel{109}.$

99

(i) Permissible values of y are 37, 43, 67, 73, $\cancel{107}$

$y = 37$: $624 - x,\ x + 74 - 110,\ 726 - x - 74$, ($624 - x,\ x - 36$, ~~652~~ $652 - x$.

~~207~~ $36 < x < 624$, should not end in 9 or 7 as $624 - x$ ends in 5 & $652 - x$ in 5.

$x = 43, 53, 71, 73, 83, 101, 103, 113, 131, 151, 163, 173, 181, 191, 193, 211, 223, 233, 241, 251, 263$

$271, 281, 283, 293, 311, 313, 331, 353, 373, 383, 401, 421, 431, 433, 443, 461, 463, 473, 491,$

$503, 521, 523, 541, 563, 571, 583, 593, 601, 613$

$\frac{473}{\frac{28}{451}}$ 301 $\frac{652}{\frac{523}{129}}$ 731 59 $\frac{433}{\frac{28}{461}}$ $\frac{179}{\frac{28}{151}}$

$\frac{499}{\frac{28}{471}}$ $\frac{463}{\frac{28}{491}}$ 599

BK Landau - Lifshitz - Statistical Physics - Oxford Univ Press 1938
20 S

J. de. Phys. t. 10, March 1939, p. 159. F. Joliot - U-disintegration

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ibid April 39 : p. 176. Boutaric & Mlle. J. Breton -
Depolarisation de la lumière par les
suspensions grossières

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p. 200 - Preliminary Communication by Guido Beck on
exact solutions of quantum theory of fields and
interaction of two fields - Interesting paper

Proc. Phys. Soc 1/3/39, p. 355. R. L. Sen Gupta - Scattering of
fast β-particle by xenon nuclei (under Blackett)

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ibid. May 39 - p. 383 - Lecture by Prof A. Fleming - Physics
& Physicists of the eighteen - seventies

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p. 402. A. Fleming - A new method of creating electrification
- falling sand on metal plate perforated with holes.

for $y = 37$, $x = 53, 83, 191, 281, 293, 383, 461, 473, 521, 541, 563, 593$. (12 values). (repetition)

Take $y = 37$, $x = 593$.

59	541	67	593
61	599	73	
563	37		
577	83	569	31

59	541	67	593
241	599	53	367
383	37	571	269
577	83	569	31

$x = 383, y = 37$

$624 - 83 = 541$, $541 + 28 = 569$, $571 + 28 = 599$ only 4 cases

But this square is not nasik nor Jaina

Comparing with the Jaina square (iv) on p. 127, Bk. 13.

~~$624 - x = 241$.~~

$636 - y = 599$, $90 - y = 53$
$534 + y = 571$ } these give $y = 37$

~~$x + 74 - 90 = x - 16 = 367$~~ ~~$x = 383$~~

$624 - x = 61$, $x - 16 = 547$. $x = 563$

$624 - 563 = 61$

So $x = 563$ gives the Jaina square.

Take $y = 37$, $x = 293$. $624 - x = 331$, $636 - y = 599$, $90 - y = 53$, $534 + y = 571$

$x + 2y - 90 = 293 + 74 - 90 = 367 - 90 = 277$, $726 - x - 2y = 726 - 293 - 74 = 726 - 367$
$= 359$

$636 - 37 = 599$; $726 - 74 = 652$; 563, 74; $637 - 110 = 527$; $83 - 36 = 47$; $624 - 521 = 103$; $521 - 36 = 485$; $293 - 36 = 257$; $473 - 36 = 437$; $383 - 36 = 347$; $624 - 293 = 331$; $624 - 383 = 241$; $652 - 383 = 269$; $636 - 37 = 599$; $110 - 37 = 73$; $534 + 37 = 571$; $53 - 36 = 17$; $726 - 74 = 652$; $652 - 383 = 269$; $383 + 74 = 457$; $457 - 90 = 367$; ~~630~~ 624; $636 - 624 = 12$; 383; $563 - 16 = 547$; $624 - 563 = 61$; $652 - 563 = 89$

BK|| R. Seeliger – Angewandte Atomphysik – Springer, 1938, R.M. 26.

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ibid. Dec 38, p. 594. P. Calderóla – New form of generalised Einstein eqns of gravitation deduced from wave eqn of electromagnetic & metrical field
— (thanks to Fermi given

J. of Sci. Instruments. March 1939, p. 90. An adjustable curve Ext. || H. H. Macey

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Ibid. May 39 : p. 168. Notice of Raman Jubilee Volume – too short

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Natuurkunde. Inhoud. Jrg. VI. No. 5 en 6, 1939
p. 89. W. Heisenberg, De Atoomkernen en hare samenstelling – has fine pictures of nuclear reactions – references to Bohr, Hahn, Strassman etc.

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p. 99. A.M.J.F. Michels – De wisselwerking der moleculen

$x =$

59	541	67	593
331	599	53	277
293	37	571	359
577	83	569	31

not near the Jaina.

97
44
141

349   97 56 153   97 64 161   97 66 163

241, 251, 283, 293
307, 317, 349, 359 } 66
337, 347, 379, 389 } 30

223
181
42

$x = \cancel{83}, y = 37, 624 - x = 541$ (repetition)

$x = \cancel{53}, y = 37, 624 - x = 571, 636 - y = 583, 90 - y = 37$. repetition

1, 11, 43, 53 } 30
31, 41, 73, 83 } 6
37, 47, 79, 89 } 60
97, 107, 139, 149

So there are just 3 cases corresponding to $x = 29$ $y = 27$ and $y = 37$; $x = 293, 383, 563$.

84
181, 191, 223, 233 } 48
229, 239, 271, 281 12

the last one giving the Jaina square. Anyway quite interesting. In fact I might add a small chapter on prime magic squares since Andrews wanted to devote a book to it!

48
13 + 19 +   276

102

17	23	11	29
$\cancel{56}-x$	$44-y$	$\cancel{92-y}$	$x+24-92$
x	y	$y-22$	$102-x-24$
7	13	19	41

Try

y 222

17 2
80
92

31, 37, 43, ~~47~~

$y = 31$

$4 - 8$ ~~16~~   8 $30 - 22 = 8$ 102 22

$y < 44$

Can we choose 1st top & bottom rows arbitrarily? No obviously not.

10 32 10
1, 11, 43, 53
30 {31, 41, 73, 83
276 {307, 317, 349, 359
30 {337, 347, 379, 389

p. 319. Report of International meeting on Physics to be held at Zurich Sept 4^{th} – 16^{th}. Lectures of on nuclear Physics, Solid body, Tech. Phys, Television, High frequency. In nuclear Physics Chairman is Scherrer, Lectures by Bohr, Chadwick, A. Euler, Hahn, Heisenberg, Joliot, Millikan & Rasetti

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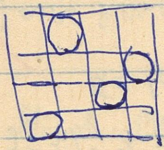
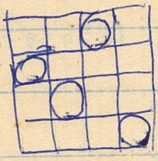
J. Opt. Soc. of America. May 1939, p. 183. H. E. Ives – Behaviour of an interferometer in a gravitational field – very interesting article



J. of Fac. of Sci of Hokkaido Imp. Univ. Ser. 2, Vol 2, Extra No 1. K. Umeda – Tabelle von $T_m(n)$ der Partitio Numerorum – Hardy – Ramanujan's work. pp 1–53 – Huge tables up to $n = 200$.



Nuovo Cimento. Nov. 38, A. 15 – N. 9, p. 551 – R. Cozza – a huge paper on a new method of measuring g

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30, 306, 30

1, 11, 43, 53 = 108

31, 41, 73, 83 = 228

307, 317, 349, 359 = 1332

337, 347, 379, 389 = 1452

S = 3120

S = 780

~~1, 11, 33, 43~~

~~0, 30, 306, 336~~

1	11	43	53
43	53	1	11
11	43	53	1
53	1	11	43

30	306	336	0
336	0	30	306
0	30	306	336
306	336	0	30

$S/2 = 390 \quad \frac{S}{2} + e$

~~C+a+c = 389.~~ 276 306

$B = 41,\ C = 73$

$A = 317,\ D = 349$

$a = 10,\ A - a = 307$

$C + a = 83.$

$d = 22$

$D + a = \cancel{359}$

$D + a - d = 337.$

$b = 12,\ B + b = 53$

$D - b = 337.$

$B + b - d = 31$

$A - a + d = 749$

53 22 307 42

$e = 31$ $a = 317, b = 43, C = 41, e = 31.$

31	317	379	53

317	43 ~~359~~	41	379
31	389	307	53
349	11	73	347
83	337 ~~43~~ ~~359~~	359	1

nanik Sjamia

780
391
389

$(a+b+e) - 390 = 1$

$(a+b+c) - 390 = 11 \qquad c - e = 10$

$a + b + c = \cancel{391}\,401$

$a + b + e = \cancel{400}\,391$ 780 401

~~390+e+c = 400.~~

~~400~~ = $S - (a+b+c) = \cancel{389}\,379$

$S - (a+b+e) = \cancel{379}\,389.$

$a + c = 401 - 43 = 358 = 317 + 41.$ 780 391 389

$\frac{S}{2}$

$C = 1.$

~~390+10=620~~

~~620~~ = 380

390
41
349

$380 = 359 + 43.$

$b = \cancel{359}\,43$

390 - 317 + 10 73 390

276+31	0+43	30+11	306+73

421
84
337

348
41
307

84
31

390
317
73

390
43
347

390 - 43 - 41 + 31

390
31
59

but colossal amount of labour using Kraitchik's form. Must find a simpler method.

Soln not easy – uses power series – by the eqn.

Ibid. May 39 – p. 324. W. Band – Association treatment of condensing systems – method simpler than that of Mayer – Ackermann

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J. app. Physics : March 39 – p. 141 – Egg or Chick?

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p. 172. L. A. Pipes – operational Calculus

" April 39 – Special issue on photo-elasticity – Further article by Pipes on operational calculus.

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p. 267. Schrödinger appointed at Ghent as visiting professor.

" May 39 – continuation of photo-elasticity – operational calculus

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p. 315. BK || Tensor analysis of networks by G. Kron – John Wiley & Sons, N.Y, 1939, $7.50

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p. 317 – Report of election of M. Born to F.R.S. – also E. J. Williams & Kaye.

0, 42, 306, 348

$$\begin{array}{rl} & \overbrace{\;1,\ 11,\ 31,\ 41\;}^{10 \quad 20 \quad 10} \\ 42\{ & 43,\ 53,\ 73,\ 83 \\ 264\{ & 307,\ 317,\ 337,\ 347 \\ 42\{ & 349,\ 359,\ 379,\ 389 \end{array}$$

(A)

~~36~~ 306	42	0	348
0	348	306	42
348	0	42	306
42	306	348	0

306 + 11, 42 + 1, ~~41 + 0~~ 0 + 41, 348 + 31

0 + 31, 348 + 41, 306 + 1, 42 + 11

348 + 1, 0 + 11, 42 + 31, 306 + 41

42 + 41, 306 + 31, 348 + 11, 0 + 1

(B)

11	1	41	31
31	41	1	11
1	11	31	41
41	31	11	1

(A) + (B) gives ~~required~~ square obtained earlier

0, 22, 510, 532

~~1, 31, 43, 73~~

$$\begin{array}{rl} & \overbrace{\;31,\ 37,\ 61,\ 67\;}^{6 \quad 24 \quad 6} \\ 22\{ & 53,\ 59,\ 83,\ 89 \\ 488\{ & 541,\ 547,\ 571,\ 577 \\ 22\{ & 563,\ 569,\ 593,\ 599 \end{array}$$

61
37
24 577

~~57~~22 ~~22~~37	510 31	0 67	532 61
0 61	532 67	22 31	510 37
532 31	0 37	510 61	22 67
510 67	22 61	532 37	0 31

37 ~~61~~	31 ~~67~~	67	61
61	67	31	37
31	37	61	67
67	61	37	31

(A)

22	510	0	532
0	532	22	510
532	0	510	22
510	22	532	0

(B)

Ramanujan's scheme

A+P	D+S	C+Q	B+R
C+R	B+Q	A+S	D+P
B+S	C+P	D+R	A+Q
D+Q	A+R	B+P	C+S

p. 881. O. Halpern – Anomalous damping of ultrasonic waves –
Points out that the damping constant of ultrasonic waves in light gases exceeds the theoretical value by several hundred to two thousand per cent & says no suitable theoretical explanation has been given & gives some qualitative explanations.

Ask SirCV

J. Chem. Phys: March 1939. p. 200. J. Frenkel – Letter on statistical theory of condensing systems – References to work of Born – Fuchs, Mayer, Uhlenbeck – Kahn – Derivation of same results in an elementary way. Full account to be published elsewhere

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p. 202 – R. Simha (Indian?) (Columbia, Dept of Chem) – Transport phenomena in cage model of liquids

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Ibid. April 39, p. 278. A. L. Selikowitz – Soln of an eqn occurring in theory of consecutive reactions

$$\left.\begin{aligned}\dot{B} &= -2R_1 B^2 - R_2 BD \\ \dot{D} &= R_1 B^2 - R_2 BD\end{aligned}\right\}$$

1158
378
780

317	x	$84-x$	379
31	y	$696-y$	53
349	$y-378$	$\cancel{472}$ 462 $-y$	347
83	$1158-x-2y$	$x+2y-462$	1

Suppose we take, instead of Malhari Rao's rows, two of the cols, 1st & last – square taken is the same one on p. 90.

$S=780$

696
84

$y > 378$ $\quad 378 < y < 472$

$y = 379$ ✗
$y = 383$ ✗
$y = 389$ ✓✓
$y = 397$ ✓ ✗
$y = 401$ ✓✓
$y = 409$ ✓ ✗
$y = 419$ ✓✓
$y = 421$ ✓ ✗
$y = 431$ ✓
$y = 433$ ✗
$y = 439$ ✓ ✗
$y = 443$ ✗
$y = 449$ ✓✓
$y = 457$ ✓ ✗
$y = 461$ ✓✓
$y = 463$ ✗
$y = 467$ ✓ ✗

472 ✓
$\cancel{207}$

389 ✓
401 ✗
419 ✓
431 ✗
449 ✗
461 ✗

696 − 389 = 307 $\quad$ 696 − 419 = 277 $\quad$ 696 − 449 = 247

780 − 462 = 318 $\quad$ 780 − 318 = 462 $\quad$ 780 + 84 = 696 (?) $\quad$ 330 − 73 = 257

1242 − 790 = $452 - x - 2y + 378$ $\quad$ 790 $\quad$ 1168 $\quad$ 1158 − 780 = 378 $\quad$ 330 − 67 = 263

696 − 378 = 318 $\quad$ 1242 − 452 = 790 $\quad$ 790 − 318 = 472 $\quad$ 1168 − 790 = 378 $\quad$ 419 − 378 = 41

247 $\quad$ 389 $\quad$ 378

472 − 389 = 83 $\quad$ 1252 − 790 = 462 $\quad$ 472 − 389 = 83 $\quad$ 472 $\quad$ 407

317	x	$84-x$	379
31	389	307	53
349	11	73	347
83	$390-x$	$x+316$	1

317	x	$84-x$	379
31	419	$\cancel{307}$ 277	53
349	41	43	347
83	$\cancel{330}$ 330 $-x$	$x+376$	1

1290 ✗

✗ 790

472 − 389 = 83

1168 − 838 = 330 $\quad$ 778 − 462 = 316

$x < 84$.

$x = \cancel{1}, \cancel{7}, \cancel{8}, \cancel{11}, \cancel{13}, \cancel{17}, \cancel{19}, \cancel{23}, \cancel{31}, \cancel{37}$
$41, 43, 47, \cancel{53}, \cancel{59}, \cancel{61}, \cancel{67}, \cancel{71}, \cancel{73}, \cancel{83}$
67

419 − 378 = 41 $\quad$ 472 − 419 = 53 $\quad$ 1168 − 778 = 390 $\quad$ 778 − 462 = 316 $\quad$ 838 − 462 = 376

1158 $\quad$ 775 $\quad$ 84 − 37 = 47

390 − 67 = 323 (?) $\quad$ 90 − 23 = 67 $\quad$ 437 $\quad$ 443 $\quad$ 390 − 37 = 353 $\quad$ 390 − 43 = 347

390 − 73 = 317

380 − 73 = 307 $\quad$ 380 − 37 = 343 $\quad$ 380 − 67 = 313 $\quad$ 390 − 23 = 367 $\quad$ 330 − 43 = 287

317	23	61	379
31	389	307	53
349	11	73	347
83	367	339	1

✗

317	37	47	379
31	389	307	53
349	11	73	347
83	353	353	1

✗

317	43	41	379
31	389	307	53
349	11	73	347
83	347	359	1

✓

3 $\quad$ 390 − 43 = 347

778 − 462 = 316
1168 − 778 = 390

refer thank Bohr for stimulating discussions)

Ibid. No. 9 (1/5/39). p. 825 – nuclear spins etc by α – particle model by R. G. Sachs

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p. 845. H. Staub & Stephens – Neutrons from break up of He^5

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p. 858. J. A. Wheeler (Princeton Univ, Princeton N. J) & W. E. Lamb – Influence of atomic electrons on radiation & pair production

Send reprint

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p. 873. James & Coolidge AS – Symmetry properties & Varsn. Fns

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p. 876-77 – 3 letters on Uranium fission

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p. 878 – Shaffer, Nielsen, L. H. Thomas (Mendenhall Lab of Phys, Ohio State Univ, Columbus, Ohio)

– Vibration-rotation energies in tetrahedrally symmetric XY_4 type of molecules – complete quantum-mech Hamiltonian is reported to have been obtained in general up to second order – paper promised later on

mipt

$y = 389, x = 43, 67.$ (43) 380 − 43 = 337; 330 − 67 = 263; 316 + 67 = 383

$y = 419, x = 13, 67, 73$

$y = 389, x = 43$

317	43	41	379
31	389	307	53
349	11	73	347
83	337	359	1

$y = 389, x = 67$

317	67	17	379
31	389	307	53
349	11	73	347
83	313	383	1

2nd row, 3rd col (1, 2) (2, 1)

330 − 13 = 317

317	13	71	379
31	419	277	53
349	41	43	347
83	317	329	1

$y = 419, x = 13$

X repeating 317

317	67	17	379
31	419	277	53
349	41	43	347
83	253	443	1

not prime

$y = 419, x = 67$

317	73	11	379
31	419	277	53
349	41	43	347
83	247	449	1

$y = 419, x = 73$

316, 67; 330 − 67 = 263; 376 + 67 = 443; 330 − 73 = 257; 380 − 67 = 313; 376 + 73 = 449; 838, 67; 1158 − 905 = 253; (0, k−1) (n−1, 0)

only 3 cases. $y = 389, x = 43$ for same square

— just as when two rows are given

Knights tour for 5×5. Instead of Fig. 42 — , but in some more reasonable ones

(1) I.D.M — B.M same. R.M to be all K.M's
(2) Islamic — " — —
(3) Western — " "

} all cases of K.M's.

(4) to (6) regular moves to be same & B.M's to be K.M's. — In all these cases start with (i, j) = (2, 4).

~~Vanishing~~ (i, j) In (1) to (3) & (4) to (6) keeping K.M's we could vary break moves or regular moves — Generalisation to extensive knight moves — Change of (i, j)

p. 978. Alichanian & Berestezky (Phys-Tech. Inst, Leningrad USSR) – Interpretation of β-disintegration data – Some criticisms of Bethes proposal of return to Fermi theory

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p. 982 – 2 letters on fission products of Uranium

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p. 986. F. Zwicky – Cosmic rays from supernovae (Norman Bridge Lab of Phys. Calif. Inst. of Tech, Pasadena, Calif)

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p. 987. J. Frenkel (Industrial Inst) Leningrad – Letter on splitting of heavy nuclei by slow neutrons – gives some simple math. considerations explaining this – Vide a letter of Feenberg about this above

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p. 988. Inglis D.R. – Angle dependence & range of nuclear forces – Reference to mesotron theory also

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p. 989. From Palmer Phys. Lab, Princeton – Penetrating β-particles from Uranium activated by neutrons – authors

(1) All cases of K. M's except (2,−1) and (−2,−1) — ~~by~~ 42, p. 32.

(2) Islamic

5	~~16~~ 22	19	11	8
18	15	7	4	~~11~~ 21
6	3	25	~~18~~ 17	14
24 ~~11~~	16	13	10	2
12	9	1	~~7~~ 23	~~8~~ 20

$(\pm 2, \pm 1), (\pm 1, \pm 2)$ B M is $(0, -2)$

(i) $\begin{pmatrix} 2, & -2 \\ 1, & -3 \end{pmatrix}$ — ~~mis that~~ ~~a+b=0~~, $a + a' = 0$.

$a' + b' = -5$ not prime to n.

u. d is $x + y = c$ $a' + b' \equiv 0$

l. d is $3x = d$. $x = d$.

Put $y = 2$, $x + 2 = c$, $c = 2, 3, 4, 0, 1$.
$x = x$ $2 + y = c$, $c = 2, 3, 4, 0, 1$

$x + y = 2$, i: 1, 2, 3, 4 (~~x=2, y=0~~).
$x = 2$ 5 cases

$i + 2x - 2y = 2$
$j + x - 3y = 2$

$(i, j) = (3, 0)$

$d = 2$
c could be any of the values, $d = 2$
$x + y = 0, 1, 2, 3, 4$ $y + 2 = 1$.
$x = 2$, $y = 3, 4, 0, 1, 2$.
$(2,3), (2,4), (2,0), (2,1), (2,2)$.
5 cases correct.

8	5	22	19	11
21	18	15	7	4
14	6	3	25	17
[illegible]	24	16	13	10
20	12	9	1	23

By general method of (c, d) ~~without a case~~ X

(neither A nor N)   with $(i, j) = (3, 0)$

(ii) $\begin{pmatrix} 2, & -2 \\ -1, & -1 \end{pmatrix}$ $a, b, a', b', ab' - a'b$ all prime to n
$a \pm b$, $a' \pm b'$ also prime to n.

Should find 25 cases — all nasik // only one associated

square, namely $i = (1 - a - a')m$, $j = (1 + b - b')m$ i.e. $(i, j) = ~~(2, 1)~~$ ~~i.e. with the Basket transform~~
$= (2, 1)$

	16	13	10	2
~~[illegible]~~	9	1		
5			11	8
18	15	7	4	
6	3		17	14

~~[illegible]~~	25	9		
		1	~~[illegible]~~	10
6	6			2
	3	7	17	11
8	12		4	8

24	3	7	11	20
12	16	25	4	8
5	9	13	17	21
18	22	1	10	14
6	15	19	23	2

p. 796. Gamow – Evolution of red giants – about cepheids as transition stage

p. 797. Anderson H. L, Fermi, Hanstein – Production of neutrons in Uranium bombarded by neutrons.

p. 800. Letter on above topic by Szilard & Zinn (Columbia N.Y.).

ibid No. 10 (15/5/39). p. 898 & p. 924 – Halpern – Johnson and J. H. Van Vleck – magnetic scattering of neutrons

p. 931. – Report of work (joint) in two labs on geological ages of rocks

p. 959 – Dancoff. S. M (Univ. of California, Berkeley, Calif) on radiative corrections for Electron – scattering – no reference to my paper. send a reprint or ask C.K.S. to give a reprint to the author

p. 963. Katharine Way – Liquid-drop model & nuclear moments –

(iii) $\begin{pmatrix}-2, & 2\\ 1, & -3\end{pmatrix}$ $a'-b'=5\equiv 0$.

u.d is $x=c$, l.d is $-x-y=d$, $x+y=d$.

$c=2$, $d=2$ just like (i) 5 cases

$y=d-2$.

~~$x=2$~~, $y+2=d$ $x+2=1$

$d=2,3,4,0,1$

(iv) $\begin{pmatrix}-2, & 2\\ -1, & -1\end{pmatrix}$ just like (ii) 25 cases

(v) $\begin{pmatrix}1, & -1\\ 2, & -4\end{pmatrix}$ $a'+b'=-5\equiv 0$. l.d is $x=c$. $(c=2)$ ~~$x=2$~~. ~~x~~.

$1, -1$
$1, -2$

u.d is $-x+3y=d$. $-x+6=d$, ~~$x=2$~~, $d=4$.

$-x+3y=4$

$d=1,0,4,3,2$.

$x=2$. $y=0,1,2,3,4$.

$-2+3y=d$, $d=3,1,4,2,0$

$-2+3y=0,1,2,3,4$

$3y=2,3,4,5,6$.

$(2,0),(2,1),(2,2),(2,3),(2,4)$ 5 cases.

$y=4,1,3,0,2$

— 5 cases.

(vi) $\begin{pmatrix}-1 & 1\\ 2 & -4\end{pmatrix}$ $a'-b'\equiv 0$, u.d is $x=c$

l.d is $x-3y=d$. $y=2$, $d=x-6$, $d=4,0,1,2,3$.

$x=2$, $d=2-3y$, $d=2,4,1,3,0$

5 cases

$(\pm 1, \pm 2)$

(vii) $\begin{pmatrix}-1 & 1\\ -2 & 0\end{pmatrix}$ × no cases at all $\because$ $b'=0$.

(viii) $\begin{pmatrix}1, & -1\\ -2, & 0\end{pmatrix}$ × ~~[illegible] $=0$~~ no cases

no cases — 2
5 cases — 4
25 cases — 2 / 8

For I.D also we must consider 8 cases.

(i) $\begin{pmatrix}2, & -2\\ 1, & -2\end{pmatrix}$ $a'-b'=0$, 5 cases.

(ii) $\begin{pmatrix}2 & -2\\ -1, & 0\end{pmatrix}$ × (iii) $\begin{pmatrix}-2 & 2\\ 1 & -2\end{pmatrix}$ 5 cases, (iv) $\begin{pmatrix}-2, & 2\\ -1, & 0\end{pmatrix}$ ×

no cases — 2
5 cases — 4
25 cases — 2 / 8

(v) $\begin{pmatrix}1 & -1\\ 2, & -3\end{pmatrix}$ 25 cases, (vi) $\begin{pmatrix}1, & -1\\ -2, & 1\end{pmatrix}$ 5 cases, (vii) $\begin{pmatrix}-1 & 1\\ 2, & -3\end{pmatrix}$ 25 cases, (viii) $\begin{pmatrix}-1 & 1\\ -2 & 1\end{pmatrix}$ 5 cases.

Bachet. (i) $\begin{pmatrix}2, & -2\\ 1, & 1\end{pmatrix}$ 25 cases, (ii) $\begin{pmatrix}2, & -2\\ -1, & 3\end{pmatrix}$ 5 cases, (iii) $\begin{pmatrix}-2 & 2\\ 1 & 1\end{pmatrix}$ 25 cases, (iv) $\begin{pmatrix}-2, & 2\\ -1, & 3\end{pmatrix}$ 5 cases

(v) $\begin{pmatrix}1 & -1\\ 2, & 0\end{pmatrix}$ × (vi) $\begin{pmatrix}1, & -1\\ -2, & 4\end{pmatrix}$ 5 cases, (vii) $\begin{pmatrix}-1, & 1\\ 2, & 0\end{pmatrix}$ ×, (viii) $\begin{pmatrix}-1, & 1\\ -2, & 4\end{pmatrix}$ 5 cases.

no cases — 2
5 cases — 4
25 cases — 2
8

p. 726. Zwicky – Theory & obsn of highly collapsed stars – makes a neutron star hypothesis with relativistic effects introduced – explains why general relativity is to be used, because gravitation is a cooperative phenomena uses Schwarzschild soln.

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p. 775. W. P. Mason – Dyn. measurement of Elastic, Electric & piezo-elec constants of Rochelle Salt

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p. 790. Tyrrel & others – Letter on binding energies of light nuclei

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p. 791. Gamow – Teller – " on energy production in red giants

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p. 792. H. Mueller – " on Electro-optical effects in colloidal solns of Bentonite.

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p. " . L. Simons (Copenhagen, – work with Bohr & Frisch) – The n-p scattering cross-section (Ref Bethe)

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p. 795. H. Aoki (Osaka) – Scattering of fast neutrons of diff. energy (Ref. Bethe – Bacher)

We have found for all the 8 cases of irregular move K.M's & usual B.M's of I.D, Islamic, & Western no. of cases possible for different (i,j)

Possibilities re. $(i,j) = (2,4)$. – We need consider only K.M's from 5 cases.

I.D. ie $\begin{pmatrix}2, & -2\\ 1, & -2\end{pmatrix}$ $i+2x-2y=2,\ j+x-2y=2$. $(x,y) = (2,0), (2,1), (2,2), (2,3), (2,4)$.

$(i,j) = (-2,0), (0,4), (2,4), (4,1), (3,$ [illegible]$)$.

ie $(2,2)$ gives $(i,j) = (2,4)$.

$\begin{pmatrix}-2, & 2\\ 1, & -2\end{pmatrix}$ $i-2x+2y=2,\ j+x-2y=2$, $(x,y)=(2,2) \longrightarrow (i,j)=(2,4)$

$\begin{pmatrix}1, & -1\\ -2, & 1\end{pmatrix}$ $i+x-y=2,\ j-2x+y=2$, $(x,y)=(2,2) \longrightarrow (i,j)=(2,4)$

$\begin{pmatrix}-1, & 1\\ -2, & 1\end{pmatrix}$ $i-x+y=2,\ j-2x+y=0$, $(x,y)=(2,2) \longrightarrow (i,j)=(2,4)$

So we have $4 + \overset{(2\text{ 5 cases})}{2} = 6$ possible cases for $(i,j)=(2,4)$. – for all these because we get associate squares & 2 points more and $(i,j)=(2,4)$

Islamic. $\begin{pmatrix}2, & -2\\ 1, & -3\end{pmatrix}$, $i+2x-2y=2,\ j+x-3y=2$, $(x,y)=(2,2) \longrightarrow (i,j) = (2,1)$ normal Islamic case.

$(x,y) = (2,0), (2,1), (2,3), (2,4) \to (i,j) = (-2,0), (0,3), (4,4), (1,2)$

ie no value of $(i,j)=(2,4)$. In fact, this is what we found on p. 32.

$\begin{pmatrix}-2, & 2\\ 1, & -3\end{pmatrix}$. $i-2x+2y=2,\ j+x-3y=2$, $(x,y) = \overset{(2,0)}{(2,1)}, \dots (2,4) \to$

$\to (i,j) =$ ~~(4,3)~~ $(1,0), (4,3), (2,1), (0,4), (3,2)$ – $(i,j) \neq (2,4)$

~~$\begin{pmatrix}-1, & 1\\ -1, & -1\end{pmatrix}$ as (i,j) cannot $(2,4)$~~

$\begin{pmatrix}1, & -1\\ 2, & -4\end{pmatrix}$, $i+x-y=2,\ j+2x-4y=2$, $(x,y) = (2,0), (2,1), (2,2), (2,3), (2,4)$

$\longrightarrow (i,j) = (0,3), (1,2), (2,1), (3,0), (4,4)$, $(i,j) \neq (2,4)$

$\begin{pmatrix}-1, & 1\\ 2, & -4\end{pmatrix}$, $i-x+y=2,\ j+2x-4y=2$, $(x,y) = (2,0), (2,1), (2,2), (2,3), (2,4)$

$\to (i,j) = (4,3), (3,2), (2,1), (1,0), (0,4)$, $(i,j) \neq (2,4)$

Except the two cases $\begin{pmatrix}2, & -2\\ -1, & -1\end{pmatrix}$ & $\begin{pmatrix}-2, & 2\\ -1, & -1\end{pmatrix}$ where we get [illegible] whatever (i,j), $(i,j) \neq (2,4)$

& $(i,j) = (2,1)$ in the above 4 cases for $(x,y)=(2,2)$

p. 587. Low energy neutrons from deuteron - deuteron reaction - by Holsfeth & Dunlap (Ref to Bethe - Bacher)

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ibid No. 7, (1/4/39) p. 654 - Gamow & Teller - Origin of the great nebulae - studies gravitational instability & draws interesting conclusions

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p. 670. P. Abelson (Berkeley, Calif) - Further products of Uranium cleavage - Report Sb, Te, I (Student of Lawrence?)

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ibid. No. 8. (15/4/39) p. 691. W. H. Barkas - Nuclear binding energies

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p. 718. G. Gamow - Physical possibilities of stellar evolution - Discusses thermo-nuclear reactions, neutron - core formation possibilities, energy prodn in red giants due to thermonuclear reactions of light elements (Li, Be, B) and pulsation in Cepheids as due to instability for transition from giant → main sequence

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(Very interesting article)

Giving associate squares. (6 cases of associate squares including 2 nasiks) where $(i,j) = (2,1)$.

Western: $\begin{pmatrix}2 & -2\\ -1 & 3\end{pmatrix}$, $i+2x-2y=2$, $j-x+3y=2$, $(x,y) = (2,0), (2,1), (2,2), (2,3), (2,4)$.

$\rightarrow (i,j) = (3,4), (0,1), \cancel{(2,2)}\ (2,3), (4,0), (1,2)$, ~~(i,j) ≠ (2,4) usual Bachet case~~ $(i,j) \neq 2,4$, $(2,3)$ usual Bachet case

$\begin{pmatrix}-2 & 2\\ -1 & 3\end{pmatrix}$, $i-2x+2y=2$, $j-x+3y=2$, $(x,y) = (2,0), \ldots (2,4)$

$\rightarrow (i,j) = (1,4), (4,1), \cancel{(2,2)}\ (2,3), (0,0), (3,2)$, ~~(i,j) ≠ (2,4)~~ $(i,j) \neq (2,4)$

$\begin{pmatrix}1 & -1\\ -2 & 4\end{pmatrix}$, $i+x-y=2$, $j-2x+4y=2$, $x = (2,0), \ldots (2,4)$

$\rightarrow (i,j) = (0,1), (1,2), \cancel{(2,2)}\ (2,3), (3,4), (4,0)$, ~~(i,j) ≠~~ $(i,j) \neq (2,4)$

$\begin{pmatrix}-1 & 1\\ -2 & 4\end{pmatrix}$, $i-x+y=2$, $j-2x+4y=2$, $x = (2,0), \ldots (2,4)$

$\rightarrow (i,j) = (4,1), (3,2), (2,3), (1,4), (0,0)$. $(i,j) \neq (2,4)$

i.e. Except for the two cases of nasik squares [illegible] $(i,j) = (2,4)$, there are no others. In fact, this is what we found on p. 32 for the Bachet case $\begin{pmatrix}2 & -2\\ 1 & 1\end{pmatrix}$. Four cases giving $(i,j) = (2,3)$ (6 cases of associate squares including nasiks) where $(i,j) = (2,3)$

If we consider both R.M's & B.M's to be K.M's, we have to consider ~~64~~ 256 cases, without, however, bothering about D.D.M, D.M & N.M. But this would be a colossal job — we may have to also consider cases $n = 5, 7, 9, 15$, etc.

$(\pm2, \pm1), (\pm1, \pm2)$

$(\pm2, \pm1), (\pm1, \pm2)$

~~(0) Cases [illegible] [illegible] eliminated~~

(1) Suppose R.M & B.M are same, ~~for~~ [illegible], would mean $a' = b' = 0$ & can be neglected i.e. 8 cases eliminated

(2) Cases of R.M & B.M being opposite, say $(2,1)$ & $(-2,-1)$ for $\begin{pmatrix}2 & -4\\ 1 & -2\end{pmatrix}$ lead to $ab' - a'b = 0$ & can be neglected i.e. 8 cases "

(3) Cases like $(2,1)$ with $(2,-1)$ or $(2,1)$ with $(-2,1)$ lead to $a' = 0$ or $b' = 0$

i.e. cases of same category cannot be R.M's & B.M's — This leaves only 32 cases.

p. 489. W. M. Elsasser – origin of Earth's magnetic field – traced to existence of thermo-electric currents in the metallic interior of the Earth.

p. 504. Feenberg – Shape & stability of nuclei – Letter on splitting of Uran. nucleus – considerations based on Bethe-Bacher's first report in Rev. Mod. Phys.

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p. 506. Nordheim – Life time of Yukawa particle

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p. 508. Keller – Note on reduction for the rotation group (Ref. vand. Waerden).

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p. 509. Corson & Thornton (California, Berkeley where CKS is going) – report on disintegration of Uranium (photograph)

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p. 510 – 512 – Reports on fission of Uranium from several laboratories

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ibid No. 6 (15/3/39).

p. 585 – Nishina, etc – Mass of mesotron – obtain $M_m = (180 \pm 20)\ m$ by expts

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(1,2) (−1,2), (1,−2), (−1,−2)

$(\pm 2, \pm 1)$ with $(\pm 1, \pm 2)$ and $(\pm 1, \pm 2)$ with $(\pm 2, \pm 1)$. (2,1), (−2,1), (2,−1), (−2,−1)

$\begin{pmatrix}2,&-1\\1,&1\end{pmatrix}$, $\begin{pmatrix}2,&-3\\1,&1\end{pmatrix}$ ×, $\begin{pmatrix}2,&-1\\1,&-3\end{pmatrix}$ ×, $\begin{pmatrix}2,&-3\\1,&-3\end{pmatrix}$ | $\begin{pmatrix}1&1\\2&-1\end{pmatrix}$, $\begin{pmatrix}1,&-3\\2,&-1\end{pmatrix}$ ×, $\begin{pmatrix}1,&1\\2,&-3\end{pmatrix}$ ×, $\begin{pmatrix}1,&-3\\2,&-3\end{pmatrix}$

$\begin{pmatrix}-2,&3\\1,&1\end{pmatrix}$ ×, $\begin{pmatrix}-2,&1\\1,&1\end{pmatrix}$, $\begin{pmatrix}-2,&3\\1,&-3\end{pmatrix}$, $\begin{pmatrix}-2,&1\\1,&-3\end{pmatrix}$ × | $\begin{pmatrix}-1,&3\\2,&-1\end{pmatrix}$ ×, $\begin{pmatrix}-1,&-1\\2,&-1\end{pmatrix}$, $\begin{pmatrix}-1,&3\\2,&-3\end{pmatrix}$, $\begin{pmatrix}-1,&-1\\2,&-3\end{pmatrix}$ ×

$\begin{pmatrix}2,&-1\\-1,&3\end{pmatrix}$ ×, $\begin{pmatrix}2,&-3\\-1,&3\end{pmatrix}$, $\begin{pmatrix}2,&-1\\-1,&-1\end{pmatrix}$, $\begin{pmatrix}2,&-3\\-1,&-1\end{pmatrix}$ × | $\begin{pmatrix}1,&1\\-2,&3\end{pmatrix}$ ×, $\begin{pmatrix}1,&-3\\-2,&3\end{pmatrix}$, $\begin{pmatrix}1,&1\\-2,&1\end{pmatrix}$, $\begin{pmatrix}1,&-3\\-2,&1\end{pmatrix}$ ×   (×, because $ab'-a'b \equiv 0$)

$\begin{pmatrix}-2,&3\\-1,&3\end{pmatrix}$, $\begin{pmatrix}-2,&1\\-1,&3\end{pmatrix}$ ×, $\begin{pmatrix}-2,&3\\-1,&-1\end{pmatrix}$ ×, $\begin{pmatrix}-2,&1\\-1,&-1\end{pmatrix}$ | $\begin{pmatrix}-1,&3\\-2,&3\end{pmatrix}$, $\begin{pmatrix}-1,&-1\\-2,&3\end{pmatrix}$ ×, $\begin{pmatrix}-1,&3\\-2,&1\end{pmatrix}$ ×, $\begin{pmatrix}-1,&-1\\-2,&1\end{pmatrix}$ −2, −1

ie 16 cases eliminated leaving ~~24~~ 16 possible cases of which ~~16~~ 8 all 16 give n cases $(n=5)$ each.

~~and 8 give results. (n = 5)~~ (no results) $(n=5)$

For $n=7$, result re. combining same type categories holds. – For other 32 cases, all are possible of which

16 give $n=7$ cases (one associate) & the other 16 give results whatever (i,j) but associates also for one of each (i,j)

For $n=9$, result re. combining same type categories holds: For the other 32 cases, 16 cases are not possible

because of $ab'-a'b = \pm 3$., of the remaining 16, ~~all give~~ none give results because $a \pm b \equiv \pm 3$.

So these 16 cases are to be examined for either 1 or 3 or 9 ~~cases~~ solns or 27, 54, 81 ~~[illegible]~~.

For $n=15$, 16 not possible because of $ab'-a'b = \pm 3$, of the remaining 16, none give results $\because a \pm b = \pm 3$

So these 16 cases are to be examined for either 1, or 3, or 5, or 15 solns.

~~[illegible]~~

Let us try one case for $n=9$, say $\begin{pmatrix}2,&-3\\1,&1\end{pmatrix}$ $u.d$ is $x-4y=c$

$b.d$ is $3x-2y=d$.

$y=4$ in u.d, $x-16=c$, $c=-16, -15, \ldots -8 \equiv 2,3,4,5,6,7,8,0,1$.

$x=4$ " $4-4y=c$, $c = 4, 0, -4, -8, -12, -16, -20, -24, -28 \equiv 4, 0, 5, 1, 6, 2, 7, 3, 8$

$[c = 0, 1, \ldots 8]$

p. 221. Hartley – Gen. derivation of 2^{nd} order wave eqn
(Flint type)

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p. 249. Dasannacharya & A. C. Seth – Geiger Point Counters

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p. 258. Review of Smart's book by ~~Snow~~ Dyson

April 39. p. 543. C. Gilbert – Kinematical description of flat space-time (à la Milne)

Physica. Vol 6, No. 3. March 39, p. 303. Groenewold –
Thermal conditions in sound waves.
question whether ultrasonic waves in He II are adiabatic or isothermal

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ibid. ~~April~~ May 39. p. 425, Alen – Nuclear packing effect

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Phys. Rev: Vol 55, No. 5 (1/3/39)
p. 434. Bethe – Energy production in stars.

In l.d is $3x-2y=d$, $y=4 \to 3x-8=d$, $d=-8,-5,-2,1,4,7,10,13,16 \equiv 1,4,7,1,4,7,1,4,7$.

$x=4 \to 12-2y=d$, $d=12,10,8,6,4,2,0,-2,-4 \equiv 3,1,8,6,4,2,0,7,5$

Common values of d are $(1,4,7)$.

& $c = 0,1,2,3,4,5,6,8$.

$$\left.\begin{array}{l} x-4y=0,1,\dots 8 \\ 3x-2y=1,4,7. \end{array}\right\} \text{(27 cases) for } (x,y) \text{ — put these in the centre.}$$

(something I did at outset)

$5x = 2d-c$.

$10y = d-3c$.

$$d=1,\ \left.\begin{array}{l}5x=2-c\\10y=1-3c\end{array}\right\}\ d=4,\ \left.\begin{array}{l}5x=8-c\\10y=4-3c\end{array}\right\}\ d=7,\ \begin{array}{l}5x=14-c\\10y=7-3c\end{array}$$

$$d=1\left\{\begin{array}{l}5x=2,1,0,-1,-2,-3,-4,-5,-6\\10y=1,-2,-5,-8,-11,-14,-17,-20,-23\end{array}\right\}\begin{array}{l}x\equiv 4,2,0,7,5,3,1,8,6.\\y\equiv 1,7,4,1,7,4,1,7,4.\end{array}$$

$$d=4\left\{\begin{array}{l}5x=8,7,6,5,4,3,2,1,0\\10y=4,1,-2,-5,-8,-11,-14,-17,-20\end{array}\right\}\begin{array}{l}x\equiv 7,5,3,1,8,6,4,2,0.\\y=4,1,7,4,1,7,4,1,7.\end{array}$$

$$d=7\left\{\begin{array}{l}5x=14,13,12,11,10,9,8,7,6\\10y=7,4,1,-2,-5,-8,-11,-14,-17\end{array}\right\}\begin{array}{l}x\equiv 0 \text{ to } 8\\y=7,4,1,7,4,1,7,4,1.\end{array}$$

But of these twenty seven are neatly arranged as

$$(x,y)=\left.\begin{array}{l}(0,1),(1,1),\dots(8,1)\\(0,4),(1,4),\dots(8,4)\\(0,7),(1,7),\dots(8,7)\end{array}\right\}\quad \left.\begin{array}{l}i+2x-3y=4\\j+x+y=4\end{array}\right\} \text{ get } (i,j) \text{ for these 27 values of } (x,y) \text{ \& construct the squares}$$

Try another case $\begin{pmatrix}-1 & 3\\-2 & 1\end{pmatrix}$ $\left.\begin{array}{l}\text{u.d is } x+2y=c\\ \text{l.d is } -3x+4y=d.\end{array}\right\}$ obviously this also leads to 27 cases since 3 appears only in one of the eqns.

This appears true of all the 16 cases possible for $n=9$ //

CAT DOG

Phil. Mag. March. 39 Vol 27, No. 182, p. 375 — O. Fischer —
Hamilton's Quaternions & Minkowski's potential —
tries to show that contrary to Minkowski's views Quaternions
can be used in 4-dimn theory — interesting article

" Jan. 39. p. 1. Electronic Waves by J. J. Thomson

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p. 33 — Narlikar — on concept of mass

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p. 51. Pendse — on concept of mass (quotes remark of Milne on author's previous paper)

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p. 62. Kothari — 3 examples of uncertainty principle

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p. 76. Kar & Basu — Neutron-proton scattering

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p. 84. W. Wilson & (Miss) Culbertson — The Elem. particle

" Feb. 39. p. 149. M. H. Martin — Euler's problem of 2 fixed centres of gravitation

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SONALI BAPU

~~Also consider composite squares as done by Andrews~~.

(4) Makhani Rai's problem – Given the l.d as in fig ~~to be~~ & also a magic series, to construct a nasik square. Here D.M is given by $(1,-1)$. If R.M be (a,b)

$\begin{pmatrix} a, & 1-a \\ b, & b-1 \end{pmatrix}$ will be the scheme in general.

13				
	19			
		25		
			1	
				7

u.d is $(a-b)x + (b-a+2)y = c$

$(0,2), (1,2), (2,2), (3,2), (4,2) \to 11, 12, 13, 14, 15$.

$(2,0), (2,1), (2,2), (2,3), (2,4) \to 3, 8, 13, 18, 23$

$1 = (0,0),\ 7 = (1,1),\ 13(2,2),\ 19(3,3),\ 25(4,4)$

$\boxed{\begin{array}{l} \text{l.d is } (a+b)x - (a+b)y = d \text{ i.e } x-y \equiv d \\ y=4,\ x-4=d,\ d=-4,-3,-2,-1,0 \equiv 1,2,3,4,0 \\ x=4,\ 4-y=d,\ d=4,3,2,1,0 \end{array}}$

$x-y=1$
$x=y+1$

$d=0 \to (x,y) = (0,0), (1,1), \ldots (4,4)$ $2+8+14+20+21 = 65$ ✓

$d=1$, $(x,y) = (1,0), (2,1), (3,2), (4,3), (0,4) \to$ ~~2, 3, 4, 5, 1 not a magic series~~

$d=2$, $(x,y) = (2,0), (3,1), (4,2), (0,3), (1,4) \to 3+9+15+16+22 = 65$ ✓

$d=3$, $(x,y) = (0,2), (1,3), (2,4), (3,0), (4,1) \to 11+17+23+4+10 = 65$ ✓

$d=4$, $(x,y) = (0,1), (1,2), (2,3), (3,4), (4,0) \to 6+12+18+24+5 = 65$ ✓

u.d is $(a-b)x + (b-a+2)y = c$

If $a=b$, $\to$ $y = c$, $c = 2$, $x-y = 0,1,2,3,4$.

$y = 2$, $x = 2,3,4,5,6 \equiv 0,1,2,3,4$, $(x,y) = (0,2), (1,2), (2,2), (3,2), (4,2)$

$\left.\begin{array}{l} a \neq 1 \\ b \neq -1 \end{array}\right\}$ ~~Take $a=b=2$~~ $a = b$ i.e $a-b=0$ does not lead to a nasik square.

$\begin{pmatrix} 2, & -1 \\ 2, & -3 \end{pmatrix}$, $a=-1, b=1$ $\begin{pmatrix} -1, & 2 \\ 1, & -2 \end{pmatrix}$ ✗ 4

[See last page of Kodwi Engg. Co. notebook]

5/7/87

explains fine-structure shift of R. C. Williams. Read this since my paper deals with same subject on Born's field theory. Send copies to authors (H. H. Wills Physical Laboratory, Univ. of Bristol)

S. 47: H. J. Bhabha — Classical theory of mesons

E. G. Cullwick — Relativity transformations of the electromag field for small velocities.

Ann. d. Phys Bd. 35 (1939) Heft. 1, p. 65. P. Gombás — Eigenfn & energy of ground state of valence electrons in alkali atoms

ibid. Heft 2, p. 118. E. Bagge — on nuclear forces & cosmic radiation

Annales de Phys.

t. 11 (May–June 39) p. 504. Marques da Silva — materialisation of energy

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Die. Phys. Siebenter Jahrgang. Heft 2, p. 79. Kohlrausch — Report on Raman Effect

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$(x,y)=(3,1)$

$(3 + ax + (1-a)y \equiv 0,\ 1 + bx - (1+b)y \equiv 0)$ posn of any other number.

(25) $(x,y) = (4,4)$, $3 + 4a + 4(1-a) = 7 \equiv 2$.

$1 + 4b - 4(1+b) = -3 \equiv 2$.

(7) $(x,y) = (1,1)$. Positions of given numbers which are $(0,0)$, $(1,1)$, $(2,2)$, $(3,3)$, $(4,4)$ do not determine a, b. since a & b cancel out identically.

Take $(x,y) = (1,0)$ ie no $= 2$. $(3+a,\ 1+b)$ is posn of 2

$(x,y) = (4,0)$ ie no $= 5$, $(3+4a,\ 1+4b)$ " of 5

$(x,y) = (0,1)$ ie no $= 6$, $\{3+(1-a),\ 1-(1+b)\}$

ie $(4-a,\ -b)$ is " of 6

B.M $= \{(4-a-3-4a),\ -b-1-4b) = (1-5a,\ -1-5b)$.

$1-5a = \pm 1$, $-1-5b = \pm 1$ ~~$5a = 2$ ...~~ $5a = 0$, $5b = 0$.

∴ (a,b) not determined.

$\left\{\begin{array}{l} a = \pm 1, \pm 2, \pm 3 \\ b = \pm 1, \pm 2, \pm 3 \end{array}\right\}$ $a=0$, $b=0$ excluded

To show that there are only two cases $a=-1$, $b=-2$, & $a=2$, $b=1$

$a = \pm 1, \pm 2$, $b = \pm 1, \pm 2$, $\pm 3 \equiv \mp 2$, $\pm 4 \equiv \mp 1$, $\pm 5 \equiv 0$ / ~~...~~

$a' \pm$ For nasik square $a \pm b \neq 0$. $a' \pm b' \neq 0$ ie ~~$a \mp (1+b) \neq 0$~~ $1-a-1-b$. $1-a+1+b$.

~~$a=\pm 1$, $b=$~~ $a \pm b \neq 0$, and ~~...~~ $a \neq 1$, $b \neq -1$.

~~$a=\pm 1$, $b=\pm 2$~~ $1-a+b+1 \neq 0$ $a-b \neq 2$, and $1-a-b-1 \neq 0$, ie $a+b \neq 0$.

$a=-1$, $b=\pm 2$, $a=-1$, $b=2$, $a-b=-3 \equiv 2$ X, $a=-1$, $b=-2$ ✓

$a=2$, $b=\pm 1$, ~~...~~ $b \neq -1$ ∴ $a=2$, $b=1$ ✓

There are just two cases as required //

& these give nasik squares. So we need not start by using Mr Hari Rao's suggestion of using K.M's, but take any a, b & deduce the two cases.

Accad. Lincei. Vol. 29 – Fasc 5, p. 175. A. Tonolo – Extension of a theorem of Gauss on geodesic triangle

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J. Franklin. Inst: May, 39. Articles on Cosmic Radiation – Vibrations in Exp. problems (normal coords)

Naturwiss. 27 J – Heft 19 (12/5/39). p. 305 – W. Bothe – Fast & slow mesotrons in cosmic radiation – A comprehensive & up to date article.

Ibid (19/5/39), p. 371. G. v. Droste u. H. Reddemann – on splitting of Uranium nucleus

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Proc. Roy. Soc. A. Vol. 171, No. 945 (19/5/39) p. 137, C.V. Raman & Venkataraman – on piezo-optic coefft of liquids

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p. 269. Fröhlich, Heitler & B. Kahn – Deviation from Coulomb law of proton – very interesting deduction from the mesotron theory. ~~as required~~ in

(−1, −2) Chakrabarty ; (2,1) BSM.

$\begin{pmatrix} -1, & 2 \\ -2 & 1 \end{pmatrix}$, $\begin{pmatrix} 2, & -1 \\ 1, & -2 \end{pmatrix} \to (3+2x-y,\ 1+x-2y)$

$\downarrow$

$(i-x+2y,\ j-2x+y) = (3-x+2y,\ 1-2x+y)$. $(i,j) = (3,1)$.

$(x,y) = (1,1) \to (4,0)$ posn of 7 ✓	posn of 7 = (4,0) ✓
$(2,2) \to (0,4)$ posn of 13 ✓	" 13 = (0,4) ✓
$(3,3) \to (1,3)$ " 19	" 19 = (1,3) ✓
$(4,4) \to (2,2)$ " 25 ✓	" 25 = (2,2) ✓

Suppose one had

13

19

1

25

7

(for nasik square)

$a,\ -1-a$
$b,\ 1-b$

$a \pm b \neq 0$, $a \neq -1$, $b \neq 1$.

$(-1-a) \pm (1-b) \neq 0$ i.e. $-1-a+1-b \neq 0$ i.e. $a-b \neq 0$

$-1-a-1+b \neq 0$, $a-b \neq 3$,

$a = \pm 1, \pm 2$, $b = \pm 1, \pm 2$.

$a = 1$, $b = \pm 2$. ~~...~~

$a = 1$, $b = -2$ ruled out $\because$ $a-b = 3$. $a = 1$, $b = 2$. ✓

$a = 2$, $b = \pm 1$. both ruled out.

$a = -2$, $b = \pm 1$. $b = 1$ ruled out. $a = -2$, $b = -1$. ✓

$\begin{pmatrix} 1, & -2 \\ 2, & -1 \end{pmatrix}$ & $\begin{pmatrix} -2, & 1 \\ -1, & 2 \end{pmatrix}$ $(i,j) = (2,2)$.

$(2+x-2y,\ 2+2x-y)$, $(x,y) = (1,1), (2,2), (3,3), (4,4) \to (1,3), (0,4), (4,0), (3,1)$

$(2-2x+y,\ 2-x+2y)$ " $\to (1,3), (0,4), (4,0), (3,1)$

Posn of 7 as (1,3) is wrong.
" 13 as (0,4) is correct
" 19 as (4,0) is wrong.
" 25 as (3,1) is correct

So if positions of 7 & 19 are interchanged we get correct results.

ibid. Fasc. 3, p. 249 – ~~W. Sche~~ W. Scherrer – Ein dynam. Modell für schwere Teilchen (Bern, mathemat. Seminar der Univ).

Ap. J. March 39: p. 218 – Period-Luminosity curve
p. 244 – Shell-source stellar model (Gamow & Critchfield)

Ann. d. Phys Bd. 34, H. 7, p. 585. O. Scherzer – Das Elektron im Strahlungsfeld

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ibid. Heft. 8, p. 689 – F. Mahler – Die Fresnelsche Beugungserscheinung an Ultraschallwellen u. ihre Auswertung nach der Methode von Mascart – Menten correspondence with calculated intensities on the Raman-Nath theory

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18/6/39 Bk: The Physical basis of things by Eldridge
McGraw Hill: Int. Series in Physics
(1934)

$\begin{pmatrix} 1, & -2 \\ 2, & -1 \end{pmatrix}$

13	16	24	2	10
4	7	15	18	21
20	23	1	9	12
6	14	17	25	3
22	5	8	11	19

nasik ✓

$\begin{pmatrix} -2, & 1 \\ -1, & 2 \end{pmatrix}$

13	4	20	6	22
16	7	23	14	5
24	15	1	17	8
2	18	9	25	11
10	21	12	3	19

nasik ✓

$-a+b+1 \neq 0$

$-a-b-1 \neq 0$

The positions of 7, 13, & 19 are not essential. Given posns of 25 and 1, conds for square being nasik determine (a, b) & hence (a', b') since break move is known. & we can proceed constructing the nasik square.

Take B M = (0, −1)

10	18	1	14	22
11	24	7	20	3
17	5	13	21	9
23	6	19	2	15
4	12	25	8	16

$\begin{pmatrix} 1, & -1 \\ 2, & -3 \end{pmatrix}$ nasik & associated

(A)

$\begin{pmatrix} a, & -a \\ b, & -b-1 \end{pmatrix}$. $a = \pm 1, \pm 2$; $b = \pm 1, \pm 2$

$a \pm b \neq 0$, $b \neq -1$

$a+b \neq -1$, $a-b \neq 1$

$a = 1, b = \pm 2$, ~~b = ±2 ..., a = 1, b = −2~~, $a = 1, b = 2$ ✓

$a = -1, b = \pm 2$, $a = -1, b = 2$ ✓

$a = 2, b = \pm 1$ ✗

$a = -2, b = \pm 1$ ✗

$\begin{pmatrix} 1, & -1 \\ 2, & -3 \end{pmatrix}$, $\begin{pmatrix} -1, & 1 \\ 2, & -3 \end{pmatrix}$

In (A) interchange cols 1 & 5 and cols 2 & 4:

& we get (B).

i.e. mere reflection about vertical thro' centre

22	14	1	18	10
3	20	7	24	11
9	21	13	5	17
15	2	19	6	23
16	8	25	12	4

(B) $\begin{pmatrix} -1, & 1 \\ 2, & -3 \end{pmatrix}$ nasik & associated ibid (28/4/39) – controversy of Weizsäcker & another on trans-Uranian element, p. 277

Wien Sitzungberichte 147 Bd (Heft 5 & 6)
p. 235. R. Inzinger – on ovals

Proc. Nat. Acad Vol 25, No. 3 March 39
p. 118 : Shapley – galactic centre
Whipple – Supernovae as due to stellar collisions – Int. theory

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ibid April 39, p. 208. J. W. Alexander – Connectivity ring of a lattice

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p. 209. Kasner & Cicco – Mobius group of $\odot^{r}$ transformations – connection with A. N. R's work?

Helv. Phys. Acta Vol. 12. Fasc. 2, p. 147 – W Pauli
– on Eigenfunctions in wave mechanics

Another example where B M is itself a K.M.

			25	
5				
	1			

Be B.M is $(1,-2)$.

$1-a-2-b \neq 0$
$1-a+2+b \neq 0$.

$\begin{pmatrix} a, & 1-a \\ b, & -2-b \end{pmatrix}$ $a \pm b \neq 0$, $a \neq 1$, $b \neq -2$
$a+b \neq -1$, $a-b \neq 3$.

$a=-1$, $b=\pm 2$, $b \neq -2$, $a=-1$, $b=2$ ✓

$a=2$, $b=\pm 1$, $a-b \neq 3 \to a=2, b=1$ ✓

$a=-2$, $b=\pm 1$, $a+b \neq -1 \to a=-2, b=-1$ ✓

BM is $(-2,1)$.

$\begin{pmatrix} -1, & 2 \\ 2, & 1 \end{pmatrix}$ ✗ since $ab'-a'b=-5$.

$a=-1, b=\pm 2$.
$a=-1, b=-2$

no nasik square possible

$\begin{pmatrix} 2, & -1 \\ 1, & 2 \end{pmatrix}$ ✗ " $=5$

$-2-a+1-b \neq 0$
$-2-a-1+b \neq 0$

$\begin{pmatrix} -2, & 3 \\ -1, & -1 \end{pmatrix}$ ✗ " $=5$

~~also not~~ no associated square possible.

$a \pm b \neq 0$, $a+b \neq -1$, $a-b \neq 2$.

perfect no square possible $\begin{pmatrix} 1, & -3 \\ 2, & -1 \end{pmatrix}$ ✗ $\begin{pmatrix} a & -2-a \\ b & 1-b \end{pmatrix}$

$a \neq -2$, $b \neq 1$.

$a=\pm 1, \pm 2$ $a=1, b=\pm 2$

$-1+6$

$a=1, b=2$ ✓, $a=2, b=-1$

$\begin{pmatrix} 2, & 1 \\ -1, & 2 \end{pmatrix}$ ✗ $b=\pm 1, \pm 2$.

$a=-1, b=-2$.

$a=\pm 2, b=\pm 1$.

$\begin{pmatrix} a & a' \\ b & b' \end{pmatrix}$ $a=\pm 1, b=\pm 2$.
$a=\pm 2, b=+1$.

$\begin{pmatrix} 1 & a' \\ 2 & b' \end{pmatrix}$ $b'-2a' \neq 0$, $a' \pm b' \neq 0$

$a=2, b=-1$

$\begin{pmatrix} 1 & 1 \\ 2 & -2 \end{pmatrix}$ possible BM $=(2,0)$.

$\begin{pmatrix} -1, & -1 \\ -2, & 3 \end{pmatrix}$ ✗ $-3-1$

20	8	21	14	2
11	4	17	10	23
7	25	13	1	19
3	16	9	22	15
24	12	5	18	6

nasik associated!

$\begin{pmatrix} 1, & -3 \\ 2, & -2 \end{pmatrix}$ BM $=(-2,0)$

nasik & associated

8	20	2	14	21
11	23	10	17	4
19	1	13	25	7
22	9	16	3	15
5	12	24	6	18

in relativistic Cosmology II

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p. 116: H. Jehle – Wavemechanical considerations in theory of stellar systems – very interesting

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p. 124: N. R. Sen – Pressure relns in interior of stars

28/5/39 Comptes Rendus t. 208, No. 12 (20/3/39)

p. 884. Proca & Goudsmit – mass of mesotron & other elementary particles

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ibid. No. 14 (3/4/39) p. 1074. Proca: Fundamental length e^2/mc^2

Naturwiss (24/3/39) 27. Jahrgang Heft 12

p. 185. J. Mattauch – Apparatus & methods of nuclear Physics – good pictures

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ibid next number contd

As mentioned on p. 93, we have not considered keeping R.M's the same & making B.M's into K.M's.

<u>I.D.M.</u> $\begin{pmatrix} 1 & a' \\ 1 & b' \end{pmatrix}$ $\quad (1+a', 1+b') = (\pm 2, \pm 1)$ & $(\pm 1, \pm 2)$

(i) $1+a' = 2, 1+b' = 1.$ × ∵ $b' = 0$, (ii) $1+a' = 2, 1+b' = -1, a' = 1, b' = -2$ ✓ (iii) $1+a' = -2, 1+b' = 1$ × $b' = 0.$

(iv) $1+a' = -2, 1+b' = -1, a' = -3, b' = -2$ or $a' \equiv 2, b' \equiv 3$ ✓

(v) $1+a' = 1, 1+b' = 2,$ × $(a' = 0)$, (vi) $1+a' = 1, 1+b' = -2$ × $(a' = 0)$, (vii) $1+a' = -1, 1+b' = 2, a' = -2, b' = 1$ ✓

(viii) $1+a' = -1, 1+b' = -2, a' = -2, b' = -3, a' \equiv 3, b' \equiv 2$ — Four possible cases.

$\underset{(a)}{\begin{pmatrix} 1 & 1 \\ 1 & -2 \end{pmatrix}}, \underset{(b)}{\begin{pmatrix} 1, & \cancel{3} \\ 1, & -2 \end{pmatrix}}; \underset{(c)}{\begin{pmatrix} 1, & -2 \\ 1, & 1 \end{pmatrix}}, \underset{(d)}{\begin{pmatrix} 1, & -2 \\ 1, & -3 \end{pmatrix}}$ no need to bother about nasiks.

$(2,-1), (-2,-1)$
$(-1,2), (-1,-2)$

(a) u.d is $y \equiv c$, l.d is $2x - y = d$. $2x - 2 = d$, $d = -2, 0, 2, 4, 6 = 3, 0, 2, 4, 1.$
$4 - y = d$, $d = 4, 3, 2, 1, 0.$

$\therefore y = 2, 2x - y = 0, 1, 2, 3, 4.$ $\quad (x, y) = \overset{(1,2)}{\cancel{(1,2)}}, (4,2), (2,2), (0,2), (3,2)$
$2x = 2, 3, 4, 5, 6$

$i + x + y = 2, j + x - 2y = 2.$ $(i, j) = \overset{(-1,5)}{\cancel{(0,6)}}, (-4, 2), (-2, 4), (0, 6), (-3, 3)$
$\equiv (4, 0), (1, 2), (3, 4), (0, 1), (2, 3)$

23	7	16	5	14
6	20	4	13	22
19	3	12	21	10
2	11	25	9	18
15	24	8	17	1

semi-nasik

21	10	19	3	12
9	18	2	11	25
17	6	15	24	8
5	14	23	7	16
13	22	1	20	4

semi-nasik

24	8	17	1	15
7	16	5	14	23
20	4	13	22	6
3	12	21	10	19
11	25	9	18	2

semi nasik

22	6	20	4	13
10	19	3	12	21
18	2	11	25	9
1	15	24	8	17
14	23	7	16	5

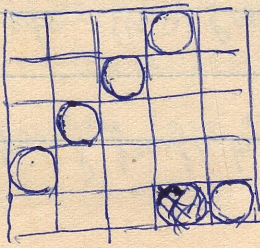
semi-nasik

25	9	18	2	11
8	17	1	15	24
16	5	14	23	7
4	13	22	6	20
12	21	10	19	3

semi-nasik

24	6	18	5	12
10	17	4	11	23
16	3	15	22	9
2	14	21	8	20
13	25	7	19	1

(Break move 0, -2)
vide p. 28



— This is identical with Fig on p. 28 for B.M $(-2, 0)$

Cf. Fig on p. 12

$(B.M) \equiv (3, 0)$

BK 2. Topological groups by L. Pontrajagin (to be published in September). $4.00

Princeton Univ Press, Princeton, N.J.

get these two books

Zs. f. Phys. 112 Bd 1–2 Heft (17/3/39)

p. 65. Hönl & Papapetrou – Self energy & gravitation field of electric charge – mentions Born–Infeld's work – no reference to mine – Send reprints to

Stuttgart, 2. Physikal. Inst. der Tech. Hochschule

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ibid 5 & 6. Heft (11/4/39): p. 257 – Th. Neugebauer (Budapest): on the Cotton–Mouton effect in quant. mech – Copious references to work of Raman, Krishnan, Bhagavantham & others of the School

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Zs. f. Astrophys. 18 Bd. 2 Heft, (22/4/39)

p. 98: W. H. McCrea – observable relations

(b) u.d is $y = c$, l.d $2x - 5y = d$. $2x - 10 = d$, $d = -10, -8, -6, -4, -2 \equiv 0, 2, 4, 1, 3$,

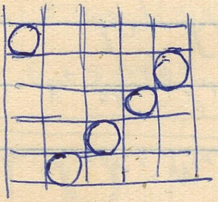
$4 - 5y = d$, $d = 4, -1, -6, -11, -16 \equiv 4, 4, 4, 4, 4$ only 4 is common

$y = 2$, $2x - 5y = 4$, $x = 7 \equiv 2$

$(x, y) = (2, 2)$ only case $i + x - 3y = 2$, $j + x - 2y = 2$, $(i, j) = (6, 4) \equiv (1, 4)$

(c) 5 cases, $i + x - 2y = 2$, $j + x + y = 2$, $(x, y) = (0, 2), (1, 2), (2, 2), (3, 2), (4, 2)$

$(i, j) = (6, 0), (5, -1), (4, -2), (3, -3), (2, -4) \equiv (1, 0), (0, 4)$ (4, 3) $, (3, 2), (2, 1)$



Same as case of O.M $(0, -2)$. Vide Fig p. 28).

(d) only case $(x, y) = (2, 2)$, $i + x - 2y = 2$, $j + x - 3y = 2$. $\rightarrow (i, j) = (4, 6) \equiv (4, 1)$

[The only cases (1, 4) & (4, 1) do not tally with Fig on p. 28] where the B.M is (2, 0) & (0, 4)

<u>Islamic method</u> $\begin{pmatrix} 1, & a' \\ -1, & b' \end{pmatrix}$ $(1 + a', -1 + b') = (\pm 2, \pm 1), (\pm 1, \pm 2)$

(i) $1 + a' = 2$, $-1 + b' = 1$, $a' = 1$, $b' = 2$ ✓ (ii) $1 + a' = 2$, $-1 + b' = -1$ ✗, (iii) $1 + a' = -2$, $-1 + b' = 1$, $a' = -3$, $b' = 2$ ✓

(iv) $1 + a' = -2$, $-1 + b' = -1$ ✗, (v) $1 + a' = 1$, $-1 + b' = 2$ ✗, (vi) $1 + a' = 1$, $-1 + b' = -2$ ✗, (vii) $1 + a' = -1$, $-1 + b' = 2$ $a' = -2$, $b' = 3$ ✓

(viii) $1 + a' = -1$, $-1 + b' = -2$, $a' = -2$, $b' = -1$. ✓ 4 cases just like O.M

$$\underset{(a)}{\begin{pmatrix} 1, & 1 \\ -1, & 2 \end{pmatrix}}, \quad \underset{(b)}{\begin{pmatrix} 1, & -3 \\ -1, & 2 \end{pmatrix}}, \quad \underset{(c)}{\begin{pmatrix} 1, & -2 \\ -1, & 3 \end{pmatrix}}, \quad \underset{(d)}{\begin{pmatrix} 1, & -2 \\ -1, & -1 \end{pmatrix}}$$

(b) & (c) lead to $(x, y) = (2, 2)$, for (b), $i + x - 3y = 2$, $j - x + 2y = 2 \rightarrow (i, j) = (6, 0) \equiv (1, 0)$

For (c), $i + x - 2y = 2$, $j - x + 3y = 2 \rightarrow (i, j) = (4, -2) \equiv (4, 3)$.

For (a), 5 cases viz $(x, y) = (0, 2), (1, 2), (2, 2), (3, 2), (4, 2)$, $i + x + y = 2$, $j - x + 2y = 2$

$\rightarrow (i, j) = \cancel{(0, 0)}, \cancel{(-1, 1)}, \cancel{(-2}, (0, -2), (-1, -1), (-2, 0), (-3, 1), (-4, 2)$

$\equiv (0, 3), (4, 4), (3, 0), (2, 1), (1, 2)$

on Self-Reciprocal fns p. 91-95.

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p. 138 – Note by Yukawa & Sakata on the mass and life time of the mesotron – interesting

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Math. Ann.: 116 Bd. 4 Heft (26/3/39)

p. 534 – E. R. Neumann – Green's fn

p. 555 – Rellich – Spectralzerlegung

p. 571 – C. F. Yu – vertices of an oval

p. 574 – W. Maak – Stokes's formula in ~~fn~~ ord. Space

p. 598 – Chow – Schnittpunkte von Hyperflächen

Bull. d. Sci. Math. t. 63, April 39, p. 97 – Review of L. M. Blumenthal's book on Distance Geometries by Lefschetz

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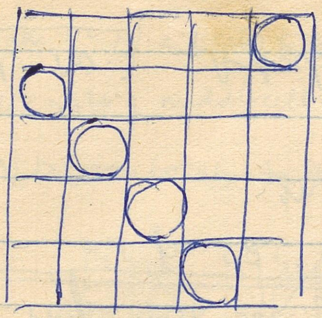
Annals of Mathematics: April 39: Advt. re. Princeton Mathematical Series

(1) Weyl: Classical groups, their invariants & representations p. 314, $ 4.00

BK



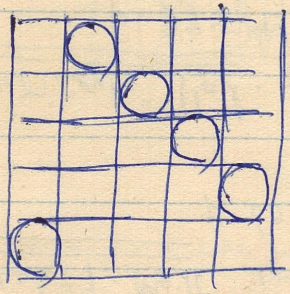
Same as for $(0,-2)$

Vide Fig. p. 30.

For (a), 5 cases. $(x,y) = (0,2), (1,2), (2,2), (3,2), (4,2)$

$i + x - 2y = 2,\ j - x - y = 2 \rightarrow (i,j) = (6,4), (5,5), (4,6), (3,7), (2,8)$

$\equiv (1,4), (0,0), (4,1), (3,2), (2,3)$



Same as for $(0,2)$

Vide Fig. p. 30

__Western method__ $\begin{pmatrix} 1 & a' \\ 1 & b' \end{pmatrix}$ – identically same results as in 9. D. M.

On pp. 28–30, we have changed break moves for the 3 methods to $(\pm 2, 0), (0, \pm 2)$ keeping R. M's same

Here " " to $(\pm 2, \pm 1), (\pm, \pm 2)$ ".

Do Andrews Figs 12 & 13, p. 10 apply to all cases of <u>n</u> odd?

$\begin{matrix} 2 & -4 \\ 1 & -2 \end{matrix}$

Take Fig. 13, $(i,j) = (1,4)$, then B M is $\overset{(-2,-1)}{\cancel{(2,1)}}$ & $(-2,-1)$ as given by R. M's $(\pm 2, \pm 1)$ don't work.

This is obvious for $\cancel{(2,1)}$, $(2,-1)$ & $(-2,1)$ since this would make $a' = 0$, $a' = 0$ & $b' = 0$. For $\overset{(2,1)}{\cancel{(-2,-1)}}$, $a' = \overset{-4}{\cancel{4}}$, $b' = 2 - 2$

& $ab' - a'b = -4 + 4 = 0$. Hence Fig. 13 is justified. For this (i,j) result is true for all <u>n</u>.

2

p. 34. Chow's paper on topological proof of fundamental theorem of Algebra : Math. Ann, 116, 463 (1939) – in consonance with Alexander's ideas in Enc. Brittanica.

Zs. f. ang. Math u Mech : Bd 19. Heft 2 (4/39)

p. 119, Ent || 2 articles by Vietoris on numerical integration and planimetry with references

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Quart. J. Math Vol 10. No. 37. March 39

p. 60 – Bailey on product of 2 Laguerre Polynomials

Rendiconti Pal. t. 61, Fasc. I II (Sept – Dec, 37)

p. 375, Maeda (Hirosima) – on completeness of orthogonal systems

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Proc. Phys-Math. Soc. Japan Vol. 21, No. 2

p. 58 – Sakata & Tanikawa – Capture of mesotrons by atomic nucleus

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ibid, No. 3 – Articles by Brij Mohan & Sastry on

Take (i, j) = 2 cells to left of middle cell of top row. Then 25 will be 2 cells to the right of middle cell of bottom row & B.M is ~~(4,1)~~ $(-4,-1)$. Consider R.M's $(\pm 2, \pm 1)$.

~~(2,1) (−2,1) are forbidden for (2,−1)~~ $\begin{pmatrix} 2 & 2 \\ -1 & 2 \end{pmatrix}$ ~~$ab' - a'b = 6$ (not prime to 7, but prime to 9.~~

~~so should work for $n = 7$, but not for $n = 9$.~~

~~(ie 25 is repeated)~~

2	25			22	20	11
21	12	3				23
	24	15	13	4		
			25	16	14	5
8	6					17
	18	9	7			
			19	10	1	

~~Does this happen for $n = 5$ also? where B.M~~ is $(4,1)$
$= (-1,1)$

~~$\begin{pmatrix} 2 & -3 \\ -1 & 2 \end{pmatrix}$~~

25	2	9	11	18
12	19	21	3	10
4	6	13	20	22
16	23	5	7	14
8	15	17	24	1

(I have made a mistake in taking 25 in place of 1.)

For $n = 5$, B.M $(-4,-1)$ is $(1,-1)$; $(\pm 2, \pm 1)$, $(2,1)$ & $(2,+1)$ $\begin{pmatrix} 2 & -1 \\ 1 & -2 \end{pmatrix}$ $ab' - a'b = -4+1 = -3$ ✓

Both allowed in Andrews also $\begin{pmatrix} -2 & 3 \\ 1 & -2 \end{pmatrix}$ ✓

For $n = 7$, B.M is $(-4,-1) = (3,-1)$, $(2,1)$, & $(-2,1)$ may be considered

$\begin{pmatrix} 2 & 1 \\ 1 & -2 \end{pmatrix}$ $ab' - a'b = -5$ not prime to 7 ✓ $\begin{pmatrix} -2 & 5 \\ 1 & -2 \end{pmatrix}$, $ab' - a'b = 4 - 5 = -1$ ✓

allowed by Andrews, So holds for 7 also.

What about $(1,-2)$ $\begin{pmatrix} 1 & 2 \\ -2 & 1 \end{pmatrix}$ $ab' - a'b = 5$ does not hold for $n = 5$, but holds for $n = 7$.

Also $(1,2)$ $\begin{pmatrix} 1 & 2 \\ 2 & -3 \end{pmatrix}$, $ab' - a'b = -3 - 4 = -7$ does not hold for $n = 7$, as in Andrews.

$(2,-1)$, $(-2,-1)$ do not hold. So Andrews Scheme holds for $n = 7$ also.

<u>$n = 9$</u>, B.M $(-4,-1) \equiv (5,-1)$, $\begin{pmatrix} 2 & 3 \\ 1 & -2 \end{pmatrix}$ ✓, $\begin{pmatrix} -2 & 7 \\ 1 & -2 \end{pmatrix}$

$ab' - a'b = 4 - 7 = -3$ prime to 9

p. 335. Morse & Hedlund – Symbolic Dynamics: Amer. J. Math 60 (1938), 815–66.

Interesting title – study of recurrence & transitivity

Zbl. (22/3/39): L. Jésmanowicz: Unicity of Schlömilch series C.R. Soc. Sci, Varsovie, 31, 43–59 (1938)

Sharma's problem

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p. 348. BK || E. Stephens: Elementary theory of operational mathematics London: Mc Graw Hill, 1937, 21/–

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p. 354: N. Wiener's paper on "The Homogeneous Chaos" (Probability) Amer. J. Math. 60, 897–936 (1938) reviewed by Höpf

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Zbl (5/4/39) p. 386. Vaidyanathaswamy's paper on Quasi-Boolean Algebras (Proc. Ind Acad A. 8 165–170 (1938)) reviewed by H.B. Curry (Princeton) who says "the paper contains nothing essentially novel"

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p. 29. Thiruvenkatachari's paper reviewed by T. Rado.

So it looks Andrews' Fig 13, p. 10 is not valid for $n = 9$ for R.M ~~(2,-2)~~ $(-2,1)$ & B M = $(5,-1)$

1	34	~~25~~	12	45	~~12~~	23	47	~~23~~
	~~22~~ 11	44		22 ~~9~~	46		9	33
43 ~~12~~		21	~~21~~		8	~~8~~ 32		10
20		~~18~~	7	31	~~20~~	18	42	7
	6	30		17 ~~8~~	41		19	
~~27~~ 29		16	40 ~~28~~		27	~~16~~ 27		5
15	39	~~26~~	26	~~26~~	28 ~~14~~	4	28	~~15~~
	~~14~~ 23	~~25~~		3 ~~2~~	36		14	38
~~8~~ 48		2	~~13~~ 35		13	~~25~~ 37 ~~34~~		24

$$\begin{pmatrix} -2, & 7 \\ 1, & -2 \end{pmatrix}$$

25 blocks 24,
(never saw an incident like this so far
rather surprising!)

$-6, -1.$

$-8, -1.$

$-10, -1.$

$(1,-1), (3,-1), (-2,-1)$

$1, -2$
$2, -1$

$\begin{pmatrix} 2, & 8 \\ 1, & 8 \end{pmatrix}$ $\begin{pmatrix} 1 & 2 \\ 2 & -3 \end{pmatrix}$ Does Andrews' scheme hold for $n = 9$ when 1 is at top ~~right~~ left hand corner

& 25 in bottom right hand corner. Here B M is $(-8,-1)$, $(1,-1)$

$\begin{pmatrix} 2, & -1 \\ 1, & -2 \end{pmatrix}$ $ab' - a'b = -4 + 1 = -3$. No does not hold. // Again a block.

Let us work out these cases by the (c,d) method - no need because $ab' - a'b$ cond itself does not hold.

So Andrews' Fig. ~~13~~ 13 does not hold for $n = 9$.

For $n = 7$, ~~three~~ four B M's ~~very~~ are starting with 1 at top left hand corner.

$(-6,-1), (-4,-1), (-2,-1); (0,-1), (2,-1), (4,-1), (6,-1)$
$(1,-1), \underbrace{(3,-1), (-2,-1), (0,-1), (2,-1)}, (-3,-1), (-1,-1).$

we have seen that Andrews scheme holds for $(3,-1)$ & $(-2,-1)$

Institute 24/5/39

Zbl. (Bd 19, 7; 3/3/39) p. 299. Kakeya & Kunjuro : Reln between length of plane curve & angles stretched by it Proc. Imp. Acad. Jap 13, ~~23~~ 296 – 300 (1937)

Related to K.V's work on Jordan's curve

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p. 302 : K.S.K's papers reviewed by Karamata without any remarks.

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p. 309. G.C. Evans on Dirichlet problems : Amer. math. Soc. Semicent Publ. 2, 185 – 226 (1938)

BK

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p. 321. T. Tang : Ninecircle theorem & the enlarged geometry Amer. math. monthly 45, 430 – 33 (1938)

enlarged point being an oriented circle

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p. 326 – 27. Narasinga Rao's papers reviewed by Buran

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p. 334. Kampen & Wintner – Dyn. Systems : Trans. Amer. math 44, 168 – 95 (1938) – Interesting paper

Re $(0,-1)$ $(0,1)$, $(\pm 2, \pm 1)$, $(\pm 1, \pm 2)$

$(2,-1)$, $(-2,-1)$, $(\pm 1, \pm 2)$ – All these 6 cases appear to hold as in Andrews' scheme.

$\begin{pmatrix} 2 & -2 \\ 1 & -2 \end{pmatrix}$ ✓, $\begin{pmatrix} -2 & 2 \\ 1 & -2 \end{pmatrix}$ ✓, $\begin{pmatrix} 1 & -1 \\ 2 & -3 \end{pmatrix}$, $\begin{pmatrix} 1 & -1 \\ -2 & 1 \end{pmatrix}$, $\begin{pmatrix} -1 & 1 \\ 2 & -3 \end{pmatrix}$, $\begin{pmatrix} -1 & 1 \\ -2 & 1 \end{pmatrix}$ ✓

Re. $(2,-1)$, $(2,1)$ & $(2,-1)$, $(-2,-1)$, $(-2,1)$, $(1,2)$, $(-1,2)$, $(1,-2)$, $(-1,-2)$

$\begin{pmatrix} -2 & 4 \\ 1 & -2 \end{pmatrix}$, $\begin{pmatrix} 1 & 1 \\ 2 & -3 \end{pmatrix}$, $\begin{pmatrix} -1 & 3 \\ 2 & -3 \end{pmatrix}$, $\begin{pmatrix} 1 & 1 \\ -2 & 1 \end{pmatrix}$ $\begin{pmatrix} -1 & 3 \\ -2 & 1 \end{pmatrix}$

[Of these for $n = 5$, Andrews gives only $(-1,2)$ & $(1,-2)$ as possible. The other two are discarded because $ab' - a'b = \mp 5$. But for $n = 7$ these should be valid]

Check these two ~~without putting 25 in the appropriate cell~~

$\begin{pmatrix} 1 & 1 \\ 2 & -3 \end{pmatrix}$ B.M $(2,-1)$

35	23	18	13	1	45	40
4	48	36	31	26	21	9
22	17	12	7	44	39	34
47	42	30	25	20	8	3
16	11	6	43	38	33	28
41	29	24	19	14	2	46
10	5	49	37	32	27	15

✓

$\begin{pmatrix} -1 & 3 \\ -2 & 1 \end{pmatrix}$ B.M is $(2,-1)$

31	27	16	12	1	46	42
5	43	39	35	24	20	9
28	17	13	2	47	36	32
44	40	29	25	21	10	6
18	14	3	48	37	33	22
41	30	26	15	11	7	45
8	4	49	38	34	23	19

✓

Both give associated squares. So Andrews' scheme is definitely wrong for $n = 7$.

Also. Is it worthwhile to make up ~~one~~ a separate one for $n = 7$ (??)

What about Andrews' fig. 12 for $n = 7$.?

Dec, 1938, p. 426, Ref || Inaccuracies in style in math. Composition by James Thomson

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p. 461. Ref || Impressions of school math. in the U.S.A. by F. J. Wood

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p. 487. on Asses' Bridge again by Didasculus

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p. 492. A note on solid Geom – model showing hexagonal plane section – two models Ent || joined by elastic band shows whole cube *

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p. 494. Ent || A trisector device – P. J. Smith. A device of a student at Kilburn Polytechnic

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P. T. O

P.T.O.

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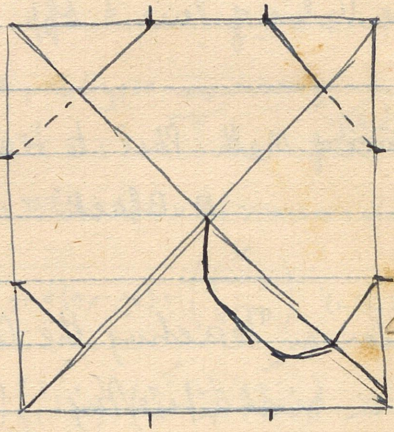


Draw on thin card a sq. of 3" sides. Mark off inch divns; draw the 2 diags and 4 lines across corners. Cut away lowest corner, but leave flap as shown. Score every line, cut thro' two dotted lines, fold up & paste.

$3 + k(a+a') = 4$
$1 + b + b' = 0$
$a + a' = 1$
$b + b' = -1$

May, 1938 . p. 105 — Pres. Address by L. Hogben on "Clarity is not enough" — Very int

Ref

p. 132. Relative Value of Pure & App. Math — Discussion

Ref

p. 149 Relevance of Math. Phil. to teaching of Mathes by M. Black

Ref

p. 164. Discussion on "Teaching the Complete Duffer" — most interesting

Ref

p. 180. A topological puzzle by H. W. Richmond

July, 1938 , p. 218. Geometry in Modern Dress — R. L. Goodstein

p. 225. Common sense of number — D. K. Picken
p. 234. Place of similarity in Geom — T. P. Nunn

Ref

p. 250. "That Dull Subject, Math" — S. F. Trustram
p. 284. The Asses' Bridge — Letter by Didasculus

Take top left hand corner. (BM) is $(-4, 4)$ ~~for n=5~~ i.e. $(1, -1)$. R.M. is one $(\pm 1, \pm 1)$ $n=5$

Same is true for $n = 7, 9$, –

$(i, j) = (1,4)$, BM is $(-2,-1)$. for $n=5$, not valid for $(1,-1), (-1,-1)$

$n=7$, $(i,j) = (1,6)$. BM is $(-4,-1)$ or $(3,-1)$ not valid for $(1,-1), (-1,-1)$. $\begin{pmatrix}1 & 2\\ 1 & -2\end{pmatrix}$✓, $\begin{pmatrix}-1 & 4\\ 1 & -2\end{pmatrix}$✓

$(i,j) = (2,6)$, BM is $(-2,-1)$ " $\begin{pmatrix}1 & -3\\ 1 & -2\end{pmatrix}$✓, $\begin{pmatrix}-1 & -1\\ 1 & -2\end{pmatrix}$✓ 3, −1

$(i,j) = (3,6)$ BM is $(0,-1)$, " $\begin{pmatrix}1 & -1\\ 1 & -2\end{pmatrix}$✓ $\begin{pmatrix}-1 & 1\\ 1 & -2\end{pmatrix}$✓ $\begin{pmatrix}1 & 4\\ 1 & -2\end{pmatrix} = -6$

$(i, j) = (4,6)$, BM is $(2,-1)$ " " $\begin{pmatrix}1 & 1\\ 1 & -2\end{pmatrix}$✓ $\begin{pmatrix}-1 & 3\\ 1 & -2\end{pmatrix}$✓

$(i,j) = (5,6)$ BM $(4,-1)$ " $\begin{pmatrix}1 & 3\\ 1 & -2\end{pmatrix}$✓ $\begin{pmatrix}-1 & 5\\ 1 & -2\end{pmatrix}$✓

$(i,j) = (6,6)$, BM $(6,-1) = (-1,-1)$, $\begin{pmatrix}1 & -2\\ 1 & -2\end{pmatrix}$ x [x]

Take $(i,j) = (3,5)$, BM is $(0,-4) = (0,3)$, $\begin{pmatrix}1 & 1\\ 1 & 2\end{pmatrix}$, $\begin{pmatrix}1 & -1\\ -1 & 4\end{pmatrix}$, $\begin{pmatrix}-1 & 1\\ 1 & 2\end{pmatrix}$ $\begin{pmatrix}-1 & 1\\ -1 & 4\end{pmatrix}$

$\underline{n=9}$. $(i,j) = (2,8)$, BM is $(-4,-1) \equiv (5,-1)$, $\begin{pmatrix}1 & 4\\ 1 & -2\end{pmatrix} \to (ab'-a'b) = -6$ x, $\begin{pmatrix}-1 & 6\\ 1 & -2\end{pmatrix}$

Even Andrews scheme of Fig 12, p. 10 is not valid for $n=9$, may be valid for $n=7$.

Again Mathari Rao's problem (p. 37) – Given ~~an~~ one orthogonal or diagonal magic series, can we find the square for $n=5$?

i.e. 5 eqns ~~for~~ in $i + ax + a'y = \alpha$, $j + bx + b'y = \beta$ (x, y, α, β) being known i.e. 5 eqns for 6 unknowns i, j, a, a', b, b' – In M's case (i,j) and $a+a'$, $b+b'$ are given ~~& the pos~~ mean becoming posting 25 & 1 & the other 3 numbers all give same $a+a'$, $b+b'$. So there appears to be no way of finding a, a' & b, b' separately. Does it mean we can take (a, b) arbitrary? $a = \pm 1, \pm 2$, $b = \pm 1, \pm 2$ other values of a & b like $\pm 3, \pm 4$ etc are unnecessary since they reduce to $\mp 2, \mp 1$. Suppose it is given that the square is to be nasik i.e. $a \pm b$, $a' \pm b' \neq 0$. of the 8 choices we have $(a,b) = (1,2), (1,-2), (-1,2), (-1,-2), (2,1), (2,-1), (-2,1), (-2,-1)$.

p. 274 – Teaching the history of Mathematics by Gino Loria
Ref

Nov, 1937 – The whole issue is devoted to teaching of Algebra & Geometry and is very useful for Refresher Course
Ref

p. 360 – Hypersolid concepts by Cyril H. A. Franklin – Mentions models shown at Brit. Assn meeting at Notts. on hyper cubes etc
Exh
Try & get these models

Dec, 1937. p. 365 – Linguistic aspects of mathematical teaching. by M. Black (?)
Ref

p. 376. Practical plane & solid geometry by F. C. Skrine
Ref

Feb, 38, p. 17 – Potential & Dirichlet's problem – Conference at London, Vallée Poussin & others

p. 73. New Geometry for Germany – Pedduck, Borel & Sadler
Ref

3	14	25	36	38	49	60	71	73
13	24	35	37	48	59	70	81	2
23	34	45	47	58	69	80	1	12
33	44	46	57	68	79	9	11	22
43	54	56	67	78	8	10	21	32
53	55	66	77	7	18	20	31	42
63	65	76	6	17	19	30	41	52
64	75	5	16	27	29	40	51	62
74	4	15	26	28	39	50	61	72

Like a fool started with (7,6)
instead of (7,3)

52	63	65	6	17	19	19	30	41
62	64	5	16		27	29	40	51
72	4	15		26	28	39	50	61
3	14		25	36	38	49	60	71
13		24	35	37	48	59	70	2
	23	34	45	47	58	69	1	12
22	33	44	46	57	68	9	21	
32	43	54	56	67	8	~~19~~		21
42	53	55	~~66~~	7	18	18	20	31

mistake after 17

D. D. scheme (p. 60)

$$\begin{pmatrix} 1, & -1 \\ 1, & -2 \end{pmatrix} (c, d) = (4,8), (7,3), (1,5)$$

(4, 8) is the usual centre of the top row, where we get an associated square. Let us write the other two

63	65	76	6	17	19	30	41	52
64	75	5	16	27	29	40	51	62
74	4	15	26	28	39	50	61	72
3	14	25	36	38	49	60	71	73
13	24	35	37	48	59	70	81	2
23	34	45	47	58	69	80	1	12
33	44	46	57	68	79	9	11	22
43	54	56	67	78	8	10	21	32
53	55	66	77	7	18	20	31	42

p. 60 itself should be (7,2) & not (7,3)

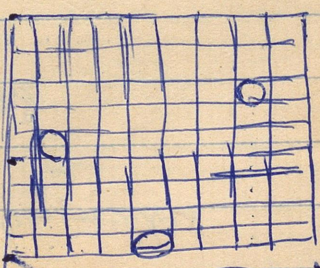


Diagram for Marshall n = 9 case with 68, 14, 41 in Centre

See next page

$(c, d) = (4,8), (7,6), (1,4)$

Acta. Math: 71: 1-2. p. 63 – Kantorovitch – on functional eqns

pp 99 & 123 – Davenport – Character sums in finite fields & Waring's problem for cubes

Comptes Rendus U.S.S.R.: Vol 22, No. 5-6 – ~~All~~

Kopenhagen Memoirs. 17, 3 (1939). Steffensen – Note on divided differences – gives a surprisingly simple formula ~~for~~ corresp. to Leibniz's formula

J. Math & Phys. March, 39: p. 34 W. C. Taylor – Whittaker & Laguerre polynoms

p. 1. W. Mayer – Charactersystems & duality theorems

Crelle. 180, 4, p. 197. Kowalewski – Berührungstransformation

Proc. ~~Math~~ Phys-Math. Soc. Jap: Vol 21, No. 5.

p. 208. Ikehara – On Kalmár's problem in "Factorisatio Numerorum"

5×17 28

54 37

53	55	66	77	7	18	20	31	42
63	65	76	6	17	19	30	41	52
64	75	5	16	27	29	40	51	62
74	4	15	26	28	39	50	61	72
3	14	25	36	38	49	60	71	73
13	24	35	37	48	59	70	81	2
23	34	45	47	58	69	80	1	12
33	44	46	57	68	79	9	11	22
43	54	56	67	78	8	10	21	32

1 in (7,2).
I-D method works

50	61	72	74	4	15	26	28	39
60	71	73	3	14	25	36	38	49
70	81	2	13	24	35	37	48	59
80	1	12	23	34	45	47	58	69
9	11	22	33	44	46	57	68	79
10	21	32	43	54	56	67	78	8
20	31	42	53	55	66	77	7	18
30	41	52	63	65	76	6	17	19
40	51	62	64	75	5	16	27	29

1 in (1,5)

p. 1272. Letter by E. R. Sabato on Alfvén's hypothesis of a "cosmic cyclotron" – criticises the idea that cosmic rays are due to acceleration of particle in the magnetic field of double stars.

Rev. Sci. Instr. June 39, p. 184. H. E. Hanson – New telescopic drive at Harvard observatory

Phys. ZS. 40, Nr. 12 (15/6/39) p. 416 – Plastic-elastic state (Math)

p. 435. Reviews of Bechert & Gerthsen's Atomphysik & Blaschke's Ebene Kinematik

Zs. f. Phys. Bd. 113 (1&2 Heft) (16/6/39)

p. 61. W. Heisenberg – Theorie der explosionartigen Schauer in der kosmischen Strahlung II

– Multiple processes on Yukawa's theory

Ref. to M. Born, Euler-Kockel, Bloch & Nordsieck, Pauli-Fierz etc

p. 115 – Th. Neugebauer – Cotton-Mouton Effect

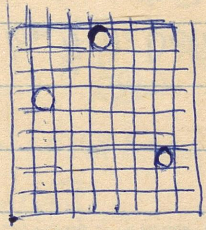
Ann. de l'École norm. sup. t. 56 (1939) (Fasc. 1)

Appln of geometry of numbers to a generalisation of continued fractions by P. H. Pepper.

47	58	69	~~70~~ 80	1	12	23	34	45
57	68	~~69~~ 79	9	11	22	33	44	46
67	~~68~~ 78	8	10	21	32	43	54	56
~~67~~ 77	7	18	20	31	42	53	55	66
6	17	19	30	41	52	63	65	~~66~~ 76
16	27	29	40	51	62	64	75	5
26	28	39	50	61	72	74	4	15
36	38	49	60	71	73	3	14	25
37	48	59	70	~~71~~ 81	2	13	24	35

associated

$(i, j) = (4, 8)$



3 cases of S.O. $(n=9)$.

Since (37, ... 45) is a magic series, let us try 37 in the middle cell & construct the square; we find that the main lower diagonal is not magic given S = 360. So there are not nine positions, but only 3.

Verified.

52	63	65	76	6	17	19	30	41
62	64	75	5	16	27	29	40	51
72	74	4	15	26	28	39	50	61
73	3	14	25	36	38	49	60	71
2	13	24	35	37	48	59	70	81
12	23	34	45	47	58	69	80	1
22	33	44	46	57	68	79	9	11
32	43	54	56	67	78	8	10	21
42	53	55	66	77	7	18	20	31

360

Ibid April 39. p. 453. A. Kalitsinsis (Athens) – Quantum theory of gravitation (ref. to Pryce, Proca etc)

J. Chem. Phys. June, 39, p. 396. Depolarisation measurements of Raman lines – expt – Cleveland & Murray

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Phys. Rev. Vol. 55, No. 12 (15/6/39)

p. 1173. Binding Energy of He^4 & nuclear forces by H. Margenau

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p. 1182. Coulomb Energies & nuclear models – Brown & Inglis

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p. 1218. Many-body interactions in atomic & nuclear systems – H. Primakoff & Holstein (Ref. to Heitler's book, Quantum mesotron theory & Fröhlich-Heitler-Kemmer's paper Stueckelberg

Comprehensive paper

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p. 1261 – Meson theory of nuclear forces by H. A. Bethe – A critical examination of the theory ~~neutral~~ & symmetrical theories & supporting the former

Read

Coming to Kraitchik's case of $n = 15$ (p. 64 of this notebook, bottom)

$\begin{pmatrix} 2 & 8 \\ 7 & 2 \end{pmatrix}$ $a+b = 9$ (not prime to 15), $a-b = -5$ (not prime to 15)

$a'+b' = 10$ (" 15). $a'-b' = 6$. (not prime to 15)

upper diagonal is $-5x + 6y = c$

Lower diagonal is $9x + 10y = c$

10y =

c = $\underline{4}$

$-5x = c - 6y$

$6y + 4$

$36 + 40$

76 $c = 1$

$\frac{105}{15}$ $\frac{226}{2}$ 24,

113.15

10, 9
−5, −6

$y = 7$ is $(0,7), (1,7), (2,7), \ldots (14,7)$ ie $(106, 107, \ldots, 120)$ summing to 1695 is a magic series

$\left[S = \frac{1}{2}\cdot 15 \cdot 226 = 113 \cdot 15 = 1695\right]$

6
12 6
~~112~~
210

$x = 7$ is $(7,0), (7,1), \ldots (7,14)$ ie 8, 17, 26, 35, ..., ~~134~~, 218 summing to $S = 1695$

105 +
30
35

is also a magic series.

$-5+24 = c$

0, 3, 6, 1, 4, 7, 2, 5, 8

14, 29, 44
69
84.

$x = \cancel{(0,4,7)}$ $x =$ (0, 3, 6), (1, 4, 7), (2, 5, 8), (3, 6, 9), (4, 7, 10)

$y =$ (0, 5, 10, $y =$ (0, 5, 10

$c = 24, 19, 14.$ $6y = 4$

$= 9, 4, \cancel{14}.$ 14.

$-5x + 6y = \cancel{14}, 4, 9$

~~6y = ... 14~~

~~6y~~ = 4y = 4

~~6y = 4.~~ //

$x =$ (0, 3, 6, 9, 12), (1, 4, 7, 10, 13), (2, 5, 8, 11, 14).

$y =$ (0, 5, 10), (1, 6, 11), (2, 7, 12), (3, 8, 13), (4, 9, 14), ~~15~~ } Groups for upper diagonal

$6y = 14$ $3y = 4$

$\boxed{-5x + 6y \equiv 9.}$

$y = 4.$

$-5x + 6y = 4$

$x =$ (0, 5, 10), ... (4, 9, 14)

$y =$ (0, 3, 6, 9, 12) ... (2, 5, 8, 11, 14) } Groups for lower diagonal.

$-5x + 42 = c.$

42, ~~37~~, 32

$c = 12, 7, 2$ //

(0,4), (3,4), (6,4), (9,4), (12,4), (1,4), ... (2,4)

(4,0), (4,5), ~~(4,10)~~ (4,10), (4,1) ... (4,2) ... (1,5), ... (4,4) –

$6y - 35 = c.$

$-35, -29, -23$

10, 1, 7

(0,4), (3,4), ..., (4,4), –

63 75
47

80
42

$\boxed{c = 7 \text{ common}}$

(4,0) ... (4,1) ... (4,2)

$-5x + 6y = 7$

$6y \equiv 7$

~~...~~ 1884 (9)

$i + 2x + 8y = 7$ $i + 14 + 56 = 7$ $i = -63 = \cancel{12}$ 12

113
$= \underline{(7,7)}$

$j + 7x + 2y = 7$ $j + 49 + 14 = 7$ $j = -56 = 4$

p. 693. H. Dingle : on Ive's experimental work and Michelson - Morley, Kennedy - Thorndike experiments - holds that these do not refute relativity. Criticises Ive's interpretation. This paper would be quite useful to answer critics of relativity. Finally the author remarks " The principle of relativity is of precisely the same character as the 2nd law of thermodynamics - a negative statement based on all the relevant evidence available. It can never be proved that absolute motion is meaningless, ~~just~~ any more than it can be proved that heat cannot move spontaneously against a temp. gradient; whereas either hypotheses might be disproved by a single observation. Those who accept the relativity hypotheses treat absolute motion detectors as those who accept thermodynamics treat perpetual motion machines. They are ready to consider any exp. evidence that absolute motion has meaning, but they no longer consider that a detailed examination of the reasons why particular experiments must fail is a profitable occupation

p. 770. Review of Hardy & Wright's book

$9x = -9 \equiv 6.$

$$-5x + 6y = c \quad -(1)$$

$$9x + 10y = d. \quad -(2)$$

For (1) put $y = 7$, $-5x + 42 = c$, for the three groups $c = 42, 37, 32, \cancel{27}, 27, 22, 17, -$
$\equiv \underline{12, 7, 2}, 12, 7, 2, -$

$9x = -6$
$= 9$

$6y = 12 + 5x, \ 7 + 5x, \ 2 + 5x$

1^{st} group. $c = 12$, $6y = 12$, $y = 2$,	$c = 7$, 1^{st} group $6y = 7$ x	$c = 2$, 1^{st} group $6y = 2$ (
2^{nd} group $c = 12$, $6y = 13$, x	2^{nd} group $6y = 12$, $y = 2$	2^{nd} group $6y = 7$ x
3^{rd} group $c = 12$, $6y = 22$ x	3^{rd} group $6y = 17$ x	3^{rd} group $6y = 12$, $y = 2$ //

$9x = -33$
$\equiv 12.$
$9x = -3$
$\equiv 12$
$9x = 3$

Putting $x = 7$, $6y = 35 + c$, $c = -35, -29, -23, -17, -11 \equiv 10, 1, 7, 13, 4$

$9x = -36 \equiv 9$ $\quad \cancel{c=10}$, $9x = c - 10y$.

$6y - 35 = c$
$-35, -29, -23, -17, -11$
$10, 1, 7, 13, 4$

		$c = 1$,	$c = 7$,	13	4
$c = 10$, 1^{st} group,	$9x \equiv 10$ x	x	x	x	x
2^{nd} "	$9x = 0$, $x = 0$	4	3	2	1
3^{rd} "	$9x = -10$ x	x	x	x	x
4^{th} "	$9x = -20$ x	x	x	x	x
5^{th} "	$9x = -30$, $x = 0$	4	3	2	1

$9x \equiv -9$
$\equiv 6$
$13 - 40$
$9x = -27 \equiv 3$
$9x = -39$
$\equiv 6$

Too complicated. Shall prove that (7, 7) is the only common ~~group~~ element of all groups.

$104y \equiv 9c + 5d.$ $\quad c = 7,$
$104x \equiv 8d - 10c.$ $\quad d = 133$
120

(13)

$63 + 65$ $\quad 128$ $\quad \cancel{728}$ $\quad 728$
$104y = 128$, $y = 7$
$104x = 78 - 70 = 8$
$x = 7$

54
59
728
63
665
113 +
(11)
798
70
728
113 +
678
70
133
798 $\quad$ 70
70
728
88
106.
79
88 97 106

$9x + 10y = d$ $\quad y = 7$, $\cancel{9x = d - 70}$ $\quad 9x + 70 = d$

$d = 10, 4, 13, 7, 1.$

$x = 7$, $10y + 63 = d$ $\quad$ 83. $\quad$ 73.

$d = 3, 13, 8, 3, 13$ $\quad \boxed{d = 13}$, $\underline{c = 7}$ $\quad$ 93. $\quad$ 83 $\quad$ 103.

ibid June 1939. p. 801. Condon – Theory of nuclear structure

|| Discussion on same by Swann

p. 819 – Permanence of finger prints! by T. Coulson

Naturwiss. 27, H. 22 (2/6/39).

" " 23/24 (9/6/39) p. 393. Nernst on Gibbs.

p. 402. Flügge – Can energy content of atomic nuclei be ~~used~~ made technically useful? – Discuss

|| technical role of Uranium fission – interesting

p. 423. Review of Smart's book by Heckmann – lot of criticisms.

ibid. H. 25 (23/6/39). p. 427. H. Phillips – Principal problems of theoretical meteorology

Ann. d. Phys. p. 359. F. Borgnis – Elec. mag schwing. dielek. Raumen

Phil Mag. Vol 27. No. 185. June 1939.

This method of finding c & d as 7 & 13 as common values for choices of graphs in the two eqns appears quite simple. Could this be applied for $n = 9$.

(A) $\begin{pmatrix} -1 & 1 \\ 2 & -1 \end{pmatrix}$ & $\begin{pmatrix} 1, & 2 \\ 4, & -5 \end{pmatrix}$ (B)

~~axy~~ =

(2) (A) $a+b = 1,\ a-b = -3,\ a'+b' = 0,\ a'-b' = 2$ $(0,3,6), (1,4,7), (2,5,8)$

upper regions $-3x+2y = c$, $8,5,2,8,5$ $-3x+8 = c$

lower $x = d$, $0,1,2,3,4$ $-1\ -4\ 2y-12 = c$ -16 -8 -6

$0,3,6$ (B) $\left.\begin{matrix} -3x+2y = 5 \\ x = 4 \end{matrix}\right\}$ $2y = 17 \equiv 8,\ y = 4$ $\boxed{1,4,7}$ -10 $14-12 = 2$

$-3x+2y \equiv 2$ $\left.\begin{matrix} -3x+2y = 8 \\ x = 4 \end{matrix}\right\}$ $2y = 20, \equiv 2 = 1.$

$x = 4.$

$2y = 14$

$y = 7.$

$-3x+8 = c$ Take all values of x from 0 to 8, $c = 8, 5, 2, -1, -4, -7, -10, -13, -16$

$2y-12 = c$,, $= 8,5,2,8,5,2,8,5,2.$

$c = -12, -10, -8, -6, -4, -2, 0, 2, 4$

2, 5, 8 are common) $= 6, 8, 1, 3, 5, 6, 0, 2, 4.$

$-3x+2y = 2,5,8 \rightarrow y = 1,7,4$

$x = 4$

$-12+40$

$-8\ -2$

$-12+16$

$(4,1), (4,7), (4,4) = 14, 68, 41$ // Put these in centre //

(B) $a+b = 5,\ a-b = -3,\ a'+b' = -3,\ a'-b' = 7.$

u.d.s $-3x+7y = c$

l.d.s $5x-3y = d$

Trans. Amer. Math. Soc : p. 256 Vol. 45, No. 2, March 39.

N. G. Grove – geometry of surface near a "spine"

ibid. May 39, p. 474

J. F. Murray – Bilinear tr. in Hilbert-space

Sci. Reports of Nat. Tsing Hua Univ. Vol 3, No. 3.

p. 239. Wiener – Fabry's Gap Theorem

(Prof at Univ in 1935–36).

~~Ital. Appl. Math. Mech~~

23/7/39 : Atti. R. Accad. Naz. Lincei : Vol. 29 – Fasc 5

p. 175 · Gauss's theorem on geodesic triangles

by A. Tonolo.

J. Fr. Inst : May 1939. p. 623 : Baños – Cosmic radiation

p. 728 – Good review of Jubilee Volume by R. H. Oppermann

" He is recognised as the leader in the promotion of scientific thinking & research in India". As a result India is making –

$y = 4, \quad -3x + 28 = c, \quad c = 28, 25, 22, 19, 16, 13, 10, 7, 4$

$\equiv 1, 7, 4, 1, 7, 4, 1, 7, 4.$

$x = 4, \quad -12 + 7y = c, \quad c = -12, -5, 2, 9, 16, 23, 30, 37, 44$

$\equiv 6, \underline{4}, 2, 0, \underline{7}, 5, 3, \underline{1}, 8.$

Common values of c are $1, 4, 7$

$5x - 3y = d, \quad 5x - 12 = d, \quad d = -12, -7, -2, 3, 8, 13, 18, 23, 28$

$\equiv 6, \underline{2}, 7, 3, \underline{8}, 4, 0, \underline{5}, 1$

$20 - 3y = d, \quad d = 20, 17, 14, 11, 8, 5, 2, -1, -4$

$\equiv 2, 8, 5, 2, 8, 5, 2, 8, 5$

Common values of $\underline{d}$ are $2, 5, 8$.

Solving these eqns $-3x + 7y = c$, $5x - 3y = d$. we get $\underline{9}$ values

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For the I.D. Case:

$\begin{pmatrix} 1 & -1 \\ 1 & -2 \end{pmatrix} \quad a + b = 2, \; a - b = 0, \; a' + b' = -3, \; a' - b' = 1$

u.d given by $y \equiv c$

l.d " $2x - 3y = d$

$2x - 12 = d \to d = -12, -10, -8, -6, -4, -2, 0, 2, 4 \equiv 6, \underline{8}, 1, 3, \underline{5}, 7, 0, \underline{2}, 4$

$8 - 3y = d \to d = 8, 5, 2, -1, -4, -7, -10, -13, -16 \equiv 8, 5, 2, 8, 5, 2, 8, 5, 2$

$d = 2, 5, 8, \quad c = 4$

$$\text{ie } \left.\begin{aligned} 2x - 3y &= 2, 5, 8 \\ y &= 4 \end{aligned}\right\} \text{3 cases}$$

that every birational transformation can be deduced from

$$\text{I} \quad x' = y, \quad y' = x \quad (\text{Exchange } T)$$

$$\underline{\text{II}} \quad x' = x, \quad y' = \frac{a_0 + a_1 x + a_2 y + a_3 xy}{b_0 + b_1 x + b_2 y + b_3 xy}$$

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p. 172. Wintner – Amer. J. math, 60, 463–72 (1938) – Liouville systems & almost periodic functions

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Weyl – ibid, 61, 143–48 (1939) – On mean motion II

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p. 173. G. Hamel – S-B. Berlin math Ges. 37, 41–52 (1938) – Non-holonomic systems of higher kinds

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p. 174 – Two papers by Armellini which ~~sound~~ look like Sulaiman's equations

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p. 180. A. Jablónski – Wave-mech treatment of line broadening in Acta Phys. polon

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p. 189. Jordan on Sokolow's paper

Islamic method

$$\begin{pmatrix} 1, & -1 \\ -1, & -1 \end{pmatrix}$$ $a+b=0$, $a-b=2$, $a'+b'=-2$, $a'-b'=0$

l.d is $2x \equiv c$, u.d is $-2y \equiv d$ ~~or 2y = d~~ $2y=d$

$x=4$, $y=+4$ ~~or 5~~ ~~c=d=~~ $c=8$, $d=\cancel{+}8=$

$-36+5$
-31

~~(4,4) (4,7)≡(4,8)≡77.~~ ~~(4,5)→50.~~ $(4,4)\to 41$ only case

Bechet's method also leads to a single case

$n=15$, p. 64

$$\begin{pmatrix} 2 & 8 \\ 7 & 2 \end{pmatrix}$$ $a+b=9$, $a-b=-5$, $a'+b'=10$, $a'-b'=6$.

u.d is $-5x+6y=c$

l.d is $9x+10y=d$

$y=7 \to -5x+42=c$, $c=42,37,32,27,22,17,12,7,2,-3,-8,-13,-18,-23,-28$

$\equiv 12,7,2,12,7,2,12,7,2,12,7,2,12,7,2.$

$x=7$, $-35+6y=c$ ~~-30x~~ ~~-35+x~~ ~~-35x+6~~ $\to c \equiv -35,-29,-23,-17,-11,-5,1,7,13,20,26,32,38,44,50$

$\equiv 1,7,4,1,7,4,1,7,13,2,8,5,11,8,5.$

only 7 is common ie $c=7$.

Using $9x+10y=d$ gives 178, 187, 196

72
70

$9x+70=d \to d=70,79,88,97,106,115, \dots 142 \equiv 7,4,13,7,1,10,4,13,7,1,10,4,13,7,1$

$63+10y=d \to d=63,73,83,93, \dots 143 \equiv 3,13,8,3,13,8,3,13,8,3,13,8,3,13,8.$

only common value is $d=13$.

102 103

ie solving the eqns $-5x+6y=7$, $9x+10y=13$ give $x=7$, $y=7$

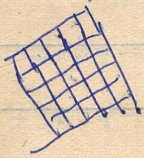
$\frac{14}{36}$ $\frac{49}{14}$ 70 63

cell (7,7) ie 113 at the centre associated

$i+2x+8y=7$, $i=-63$ ~~(i,j)=~~

$j+7x+2y=7$, $j=-56$ $(i,j)=(12,4)$.

p. 140. L. Hibbert — Bull. Soc. Math. France 66, 81–113 & 115–54. —



Univalence & automorphy for polynomials & integral fns —

Study of curves $|f(z)| = \text{const}$ & $\arg f(z) = \text{const}$

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ibid. Heft 4 (27/5/39)

Ent || p. 154. Tudor A. Tănăsescu — Elektrische Lösungsverfahren für alg. Gleichungen — Gaz-mat (Rumanian) 44, 287–292 (1939)

(Very interesting)

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p. 157. J. H. Rüegg — Book on notable points of a triangle

BK || — a big figure with large number of points & 79 theorems without proof : Zurich, 1938, 16. S.

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p. 158. Menger's "joining" & "intersecting" axioms

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p. 15 Gambier — On a configuration of 3 conics — Bull. Roy. Soc. Belgique V. S, 24, 765–80 (1938

Problem for Sastri ?

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p. 162. H. W. E. Jung. Crelle. 180, 97–109 (1939) — Proof

So we have evolved a far simpler method for the case of composite $\underline{m}$: viz $m = 9$, $m = 15$. $\boxed{\text{merely mechanical}}$

This method should also hold good ~~for~~ n = prime = 5.

See pp. 139 ~~-92~~ onwards

Take Kraitchik's cases.

(a) $(1,1) + r(1,2) + s(1,-1)$, K. p. 159

From p. 52, the scheme is $\begin{pmatrix} 2, & -3 \\ -1, & 3 \end{pmatrix}$; $a+b=1$, $a-b=3$, $a'+b'=0$, $a'-b'=-6$

u.d is $3x-6y=c$,

l.d is $x=d$.

$3x-6y=c$, $y=2$, $3x-12=c$, $c=-12,-9,-6,-3,0 \equiv 3,1,4,2,0$.

$x=2$, $6-6y=c$, $c=6,0,-6,-12,-18 \equiv 1,0,4,3,2$. All common

$\left.\begin{array}{l} 3x-6y=0,1,2,3,4 \\ x=2 \end{array}\right\}$ $6-6y=0,1,2,3,4$

$3x-6y=0$.

$-6y=$

$6y=3$

18

$6y \equiv 6,5,4,3,2$

$y=1,0,4,3,2$.

$i + 2x - 3y = 2$

$j - x + 3y = 2$

$(2,1), (2,0), (2,4), (2,3), (2,2)$ five cases. ; $(i,j) = (1,1), (3,4), (0,2), (4,0), (4,3)$

$(8, 3, 23, 18, 13)$ Fig 36, K, p. 160 has 23 in the centre with $(i,j)=(0,2)$

(b) $(1,1) + r(2,1) + s(1,2)$

$\begin{pmatrix} -1, & 3 \\ -2, & 4 \end{pmatrix}$ $a+b=-3$, $a-b=1$, $a'+b'=7 \equiv 2$, $a'-b' \equiv -1$

$\left.\begin{array}{l} \text{u.d is } x-y=c \\ \text{l.d is } -3x+2y=d \end{array}\right\}$ $c=(-2,-1,0,1,2),(2,1,0,-1,-2) \equiv (0,1,2,3,4)$

$d=(4,1,-2,-5,-7),(-6,-4,-2,0,2)$

$\equiv (4,1,3,0,2),(4,1,3,0,2)$

$x-2=c$.

$2-y=c$

$-3x+4=d$

$-6+2y=d$

25 cases i.e. Nasik square.

p. 65. N. G. Touganoff (Compts Rend. U.S.S.R. N.S. 20, 511–12 (1938).
— lines on a surface whose torsion (geodesic) and normal curvature are connected linearly – extension of Bertrand curves

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p. 67 – Review of Blaschke & Bol's book by Haupt

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p. 90. R. J. Duffin – Phys. Rev, II S, 54, 1114 (1938) – Characteristic matrices of covariant systems

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p. 93. K. Yano – Proc. Imp. Acad, Jap – on Einstein-Bergmann theory

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Ibid. Heft. 3, p. 98. Logic of algebra by P. Dreies (Actualité Series) – criticised adversely by H. B. Curry

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p. 115. T. Satô – Tôhoku J. 45, 120–23 (1938) – A brief proof of the closure of Hermite functions

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p. 130. M. Tsuji – Jap. J. Math, 15, 19–26 (1938) – limits of indetermination of bounded harmonic fns

For the D. D. method $\begin{pmatrix} 1 & -1 \\ 1, & -2 \end{pmatrix}$ $a-b=0$, $a+b=2$, $a'-b'=1$, $a'+b'=-3$.

$n=5$. u.d is $y\equiv c$, l.d is $2x-3y=d$.

$c=2$, $2x-6=d$, $d=-6,-4,-2,0,2. \equiv 4,1,3,0,2$

$4-3y=d$, $d=4,1,-2,-5,-8 \equiv 4,1,3,0,2$

$2x-3y=0,1,2,3,4$. $\qquad 2x-6=3$.

$y=2$

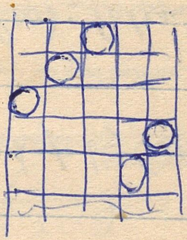
$x=3$, $2x\equiv 7$, 4, $2x\equiv 9$, 5

$3,1,4,2,5$.

$\cancel{(3,2)}, \cancel{(1,2)}, (1,2), (2,2), (3,2), (4,2), (0,2)$.

$11, 12, 13, 14, 15$. $\quad i+x-2y=2$, $j+x-2y=2$

corresponding to the $(i,j)=(4,6), \cancel{(3,5)}\ (3,5), (2,4), (1,3), (0,2)$

$\equiv (4,1), (3,0), (2,1), (1,3), (0,2) \longrightarrow$  ✓

K. p. 163, $n=35=5\times 7$, $(1,1)+r(2,1)+s(1,2)$

~~$D=1-2=-1$, $a=-2$, $b=-1$, $a+a'=34(-2)/1=-34$. $b+b'$~~ $=-34\cdot 1/-1=34$.

$D=4-1=3$, $a=2/3$ | $3a\equiv 2$ | $a+a'\equiv -34/3$

$b=-1/3$, $3b\equiv -1$ | $b+b'\equiv -34/3$

$a=24$, $b=23$, $3(a+a')=-34\equiv 1$, $a+a'=12=b+b'$

$a'=-12$, $b'=-11$. $\begin{pmatrix} 24, & -12 \\ 23, & -11 \end{pmatrix}$ $\quad ab'-a'b=-264+276=-8$.

$a+b=47\equiv 12$, $a-b=1$, $a'+b'=-23$ $\quad 23$

$a'-b'=-1$. ~~[illegible]~~

Just a nasik square

p. 19. J. Delsarte ; Acta Math, 69, 259–317. New extension of theory of A. P. fns – Fenchel calls these eingehend untersuchten Integral transf

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BK. Physik in Streifzügen von Dr H. Greinacher (Springer) R. M. 4.80

Ibid . Heft 2. (5/5/39)

p. 49. Review of Steinhaus' Math. Snapshots by Geppert

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p. 52. V. Strazzeri – bi-apolar conic – Rend. Palermo 61, 100 – 110 (1937)

G. Biggiogero – theorem about $x^2/a^2 - y^2/b^2 = 1$ &

$x^2/b^2 - y^2/a^2 = 1$

and circle of radius $\sqrt{ab}$.

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p. 54. Review of Roomi's Geometry of determinantal loci by E. A. Weiss

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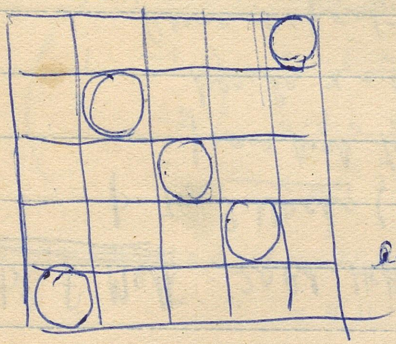
3/8/77



The adjoining is one Friesen's diagrams (Andrews. Fig. 419, p. 250)

Can we find a scheme which will give these five as starting points

$(i,j) = (0,0), (1,3), (2,2), (3,1), (4,4)$.

$\cancel{2+}\ + ax_1 + a'y_1 = 2$, $bx_1 + b'y_1 = 2$ | $ax_2 + a'y_2 = 1$, $bx_2 + b'y_2 = -1$ | $ax_3 + a'y_3 = 0$, $bx_3 + b'y_3 = 0$ | $ax_4 + a'y_4 = -1$, $bx_4 + b'y_4 = 1$

$ax_5 + a'x_5 = -2$, $bx_5 + b'x_5 = -2$

Taking $(x_3, y_3) = (2,2)$ to give 13 in centre, $\cancel{0}\ 2a + 2a' = 0$, $2b + 2b' = 0$.

$a + a' = 0, b + b' = 0$ ie break move $= (0,0)$ which is meaningless. So this choice of (x_3, y_3) is meaningless. $y_3/x_3 = -\frac{a}{b} = -a'/b'$ ie $ab' - a'b = 0$. forbidden. Whatever (x_3, y_3) other than $(0,0)$

But there is a magic square with 1 in the centre. Fig 47, p. 33. for $\begin{pmatrix} 1, & -1 \\ 2, & -3 \end{pmatrix}$

$2 + ax + a'y = 2$, $2 + bx + b'y = 2$ — $(x = 0, y = 0)$

~~a-b=1~~

$2, -1$
$2, -2$

$a - b = 0, a + b = 4$

$a' - b' = 1, a' + b' = -3$

$x_1(a-b) + y_1(a'-b') = 0.$

$x_2(a+b) + y_2(a'+b') = 0.$

$x_3(a \pm b) + y_3(a' \pm b') = 0.$

$x_4(a+b) + y_4(a'+b') = 0$

$x_5(a-b) + y_5(a'-b') = 0$

u.d is $y = c$

l.d is $4x - 3y = d$. $c = 2$.

$4x - 6 = d$, $d = -6, -2, 2, 6, 10 \equiv 4, 3, 2, 1, 0$.

$8 - 3y = d$, $d = 8, 5, 2, -1, -4 \equiv 3, 0, 2, 4, 1$.

$4x - 3y = 0, 1, 2, 3, 4$, $4x - 6 = 0, 1, 2, 3, 4$

$y = 2$

$4x \equiv 6, 7, 8, 9, 10 \equiv 1, 2, 3, 4, 0$

$x = 4, 3, 2, 1, 0.$

$i + 2x - y = 2$, $j + 2x - 3y = 2$ $\}$ $(i,j) = (4$ $\cancel{(2,0)}$, $(0,2)$, $(1,2)$, $(4,2)$ ✗ not obvious

Proc. Lond. Math. Vol 45. Part 3, p. 229. Kober – Self-reciprocal fns

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ibid. Pt. 4. p. 243, J. H. C. Whitehead – Simplicial spaces, nuclei & m-groups (Topology)

Quart. J. Math. Vol. 10, No. 37, March 39.

p. 28. Rado – Elem. Tauberian Theorems

p. 45. Kober – Hankel, Fourier etc transforms

p. 60. Bailey – Product of 2 deg. Polynoms

p. 75. E. C. Titchmarsh – Example of spect. of fn

J. Hiroima Univ: Vol 9, No. 2, March, 39.

p. 73 & 85 – F. Maeda – Continuous geometry

Zbl. f. Math: 20 Bd. Heft. 1 (28/4/39)

p. 7. S. Wachs (Bull. Soc. Math. France, 66, 164–70 (1938) proves that Fermat's eqn $(2x^2-1)^2 = 2y^2-1$ has besides $x=1, y=1$, $x=2, y=5$ no other integral solns.

Reviewer points out this has been already shown by Genocchi (Nouv. Ann. (3), 2, 306–310, 1885).

~~Take J.M.S. magic square literature available.~~

Let us try I.D. method for $n = 15$

$$\begin{pmatrix} 1 & -1 \\ 1, & -2 \end{pmatrix} \quad \begin{array}{l} a-b=0,\ a+b=2,\ a'-b'=1,\ a'+b'=-3. \\ \text{u.d is } y=c \qquad c=7 \\ \text{l.d is } 2x-3y=d. \end{array}$$

$y=7,\ 2x-21=d,\ d=-21,-19,-17,-15,-13,-11,-9,-7,-5,-3,-1,1,3,5,7$

$\equiv 9,11,13,0,2,4,6,8,10,12,14,1,3,5,7$

$x=7,\ 14-3y=d,\ d=14,11,8,5,2,-1,-4,-7,-10,-13,-16,-19,-22,-25,-28$

$\equiv 14,11,8,5,2,14,11,8,5,2,14,11,8,5,2.$

ie common values of d are $2,5,8,11,14$. ie 5 cases.

$y=7,\quad 2x-21=2,5,8,11,14,\ 2x\equiv 23,26,29,32,35 \equiv 8,26,14,2,20$

$x=4,13,7,1,10.\ (1,4,7,10,13)$

~~(...), (...), (4,7), (4,10), (4,13) (4,7)~~ $(1,7),(4,7),(7,7),(10,7),(13,7).$

$$\left.\begin{array}{l} i+x-y=7 \\ j+x-2y=7 \end{array}\right\} (i,j)=(13,20),(10,17),(7,14),(4,11),(0,8)$$

$\equiv (13,5),(10,2),(7,14),(4,11),(1,8).$

$(7,14)$ usual point of starting at middle of top row giving associated square. For diagram see next page

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Now let us go to J.I.M.S. magic square items.

(1) Vol. 16, No. 9. 1926 – S. Ananarayan (Geometric magic squares of H.A. Sayles, Andrews, p. 283)

Omit this

Math. Ann. Bd. 116. Heft 4 (20/3/39)

p. 534. E. R. Neumann — Boundary value problems & Green's function

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p. 555. Rellich's article III on Spektralzerlegung

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p. 57. C. F. Yu — on vertices of an oval — Reference to Hurwitz, Graustein, Hayashi, Suss & Ganapathi

Theorem proved is — An oval of class n ($n = 1, 2, 3$ —) has at least $2n+2$ mean points & $2n+2$ primary vertices

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Monat. f. Math. u. Phys. 47 Bd. 2 Heft.

p. 179. H. Baron — Der Grenzkegelschnitt — Kommerell's Fachwerke construction - Fortsetzung

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Proc. Phys-Math. Soc. Jap. Vol 21, No. 2

p. 58. Sakata & Tanikawa — Capture of mesotron by atomic nucleus

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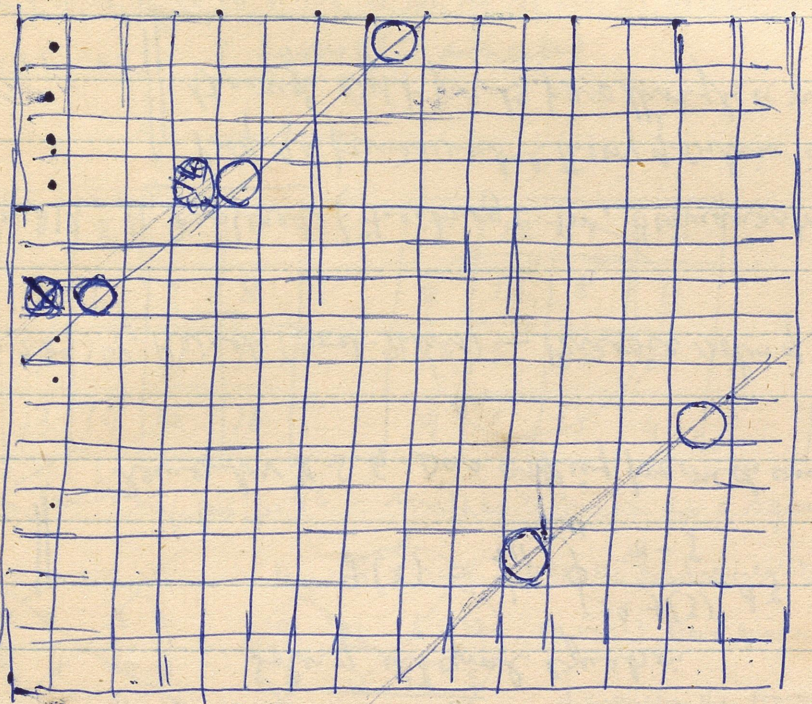

along broken diagonals.

(J.D method for $n = 15$, 5 cases)

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(2) Vol. 16, No. 10, 1926 (N.P. Pandya)

Problem about $n = 3$ with lowest prime numbers. — Dudeney's soln (See Rouse-Ball, Fig XXV, p. 211) is given by reflecting same about vertical line thro' Centre i.e. interchange of 1st & 3rd cols. Next lowest primes case is given as

101	5	71
29	59	89
47	113	17

by solvers N.B. Mitra & Mehta Kanhyalal — Quite trivial.

2nd part of Pandya's question is to find a $n = 3$ square all numbers being perfect squares.

p. 201. S. A. Savin – Abridged formulas for integral polynomials – appl. to Sph. Harmonics

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ibid, March 39, p. 28. B. McMillan – on transcendental numbers

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p. 34. W. C. Taylor – Whittaker fns & Laguerre polynomials

Math. ZS. Bd. 45, 2 Heft, (28/4/39)

p. 245. H. Söhngen (Berlin-Adlershof, Hoffmannstrasse 2)

Soln of integral equation

$$g(x) = \frac{1}{2\pi} \oint_{-a}^{+a} \frac{f(\xi)}{x-\xi}\, d\xi$$

Remember K. S. G. Das asking for such an eqn

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p. 289. P. Reisch (Doct. Thesis) – Periodic solns of 3 body problem

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p. 312, H. Kapferer (Freiburg i. Br, Hermannstrasse 17) –

Proof of a fundamental theorem of cubics ie All cubics through eight points pass through a ninth

---

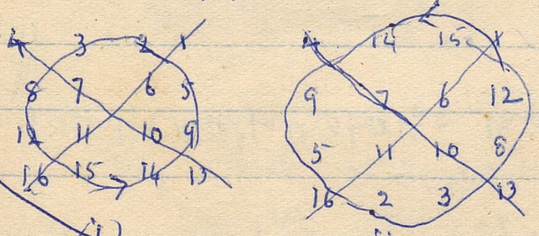
	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39
1	4	9	16	25	36	49	64	81	100	121	144	169	196	225	256	289	324	361	400

1, 25, 49. (Looks too difficult)

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

7	12	1	14
2	13	8	11
16	3	10	5
9	6	15	4

from Carrés magiques, p. 44 – Agrippa's construction for a square $n = 4$



(i) (ii)

with the fundamental square written as in (i), leave diagonals intact & encircling the remaining the nos, rotate them along the circle through $180°$ to get the magic square (ii) – Quite elegant

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a^2	b^2	c^2
d^2	e^2	f^2
g^2	h^2	i^2

~~$a^2+c^2=2b^2$~~ $b^2 = a^2 + x$, $c^2 = b^2 + x$, $e^2 = d^2 + x$, $f^2 = e^2 + x$

$d^2 = a^2 + y$, $f^2 = d^2 + y$.

$a^2 \quad a^2 + x \quad a^2 + 2x$

$a^2 + y$, $a^2 + x + y$, $a^2 + 2x + y$

$a^2 + 2y$; $a^2 + 2y + x$, $a^2 + 2x + 2y$.

1	15	14	4
12	6	7	9
8	10	11	5
13	2	3	16

Jahr. d. deut. Math. Verein. 49 Bd. Ht 1. (29/4/39)

p. 1. L. Vietoris – n-gliedrige Verschlingungen (Topology)

|| p. 86 – H. Schmidt on High School mathematics

|| p. 1 of Aufgaben: Example of D. Arany on ellipse inscribed in Δ^le.

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p. 25 – Review of Albert's book by W. Landherr

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p. 27 Siefert & Threlfall's book on Variationsrechnung – Teubner, 1938
R.M. 9

BK ||

Crelle's Journal: Bd. 180, Heft 3. (12/5/39)

p. 129. G. Nöbeling: Topological structure of classes of finite order

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J. of Math & Phys. Jan 39, p. 233 – Wiener & Wintner – Singular distributions

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p. 247. Wiener & Pitt – Generalisation of Ikehara's theorem

$m+x$	$m-(x+y)$	$m+y$
$m-(x-y)$	m	$m+(x-y)$
$m-y$	$m+(x+y)$	$m-x$

$m=a^2,\ a^2+x=b^2,\ a^2-x=c^2$

$x=b^2-a^2=a^2-c^2$ $2a^2=b^2+c^2$

~~a+b+~~

46	a	b	c	16
d	54	112-(a+d)	39	d'
e	101-(a+d)	27	131-(c+d)	e'
f	50	120-(f+f')	35	f'
73	~~89-a~~ a'	~~89-b~~ b'	~~89-c~~ c'	43

Vol. 10, No. 2, 1918, p. 330

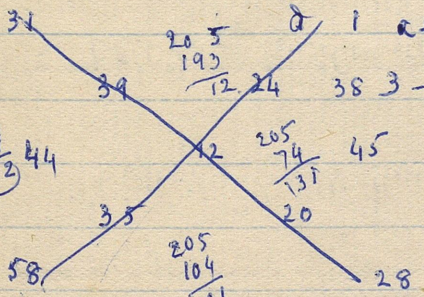
Sadanand - Fill up the vacant cells of the following magic square.

~~808~~

$163-a+c=205;\ c-a=42$

~~193~~ ~~193+a-c=205~~ ~~a-(a+42)~~ =12

$193+a-c=$ ~~205~~ ~~a-c=12~~ ~~a-c=12~~ ~~c-a~~ =42



~~89~~ 27 ~~62~~ 44

$a+b+c=205-62=143$

$383-(a+b+c)=205$. 45

383
205
178

~~a+b+c=178~~ =143

383
143
240

$a+a'=101$

$c+c'=131$

$a+d'=$

$104+a+a'=205$

$74+$ ~~c+c'~~ $=205$

59
12
47

~~13~~ 0

205
93
112

205
85
120

27
89
116

205
62
143

205
89

~~97~~ 8

Sadanand initially deceived me by suggesting an associated square.

$a+b+c=143;\ d+e+f=86$

$a'+b'+c'=89;\ d'+e'+f'=146.$

48, ~~37, 49, 58~~ 48, 37, 58

232
108

~~30~~
32, 24, 33

205
116
89

205
119
86

205
59
146

$259+(b+b')-(d+d')-(f+f')=205$

$259-(a+a')-(c+c')+e+e'=205$

259

$D+E+F-A-B+C=108$

356

$A+B-C=124$

$A+B+C=232$

108

259
205
54

~~B-D=1~~ $D+F-B=54;\ A+B+C=232=D+E+F$

$C+E-A=54,$

$A+B=178$

$C=54$

$D+F-B$

$-C-E+A=0.$ $D+F-E=B+C-A.$ $A+B+C=D+E+F$

$-A+B+C=D-E+F$

$A=E,\ B+C=D+F$

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(1) ~~gravitation~~ General theory of relativity

(2) its mathematical achievements.

(2) Its astronomical achievements – Expanding Universe, white dwarf stars.

(3) Its physical achievements – Unified theories.

(4) Principle of relativity & 2nd law of thermodynamics – negative statement based on all relevant evidence i.e. absolute motion is meaningless. This can be no more proved than 2nd law. relativity absolute motion detectors perpetual machine makers

either hypothesis might be disproved by a single observation. Any exp evidence that absolute motion has meaning can be considered. A detailed examination of the reasons why a particular experiment fails is a profitable occupation

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