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FRACTIONAL PARTITION

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ABSTRACT

The purpose of this article to introduce a new concept Fractional Partition and also discuss its few properties.

***Key wards**: Exact values, not exact values, fractional partition.*

INTRODUCTION:

The formal concepts and properties of partitions have been investigated for over 300 years by few of the genius scholars in mathematics such as L. Euler (1707-1783), G. H. Hardy (1877-1947) and S. Ramanujan (1887-1920). The purpose of this paper is to discuss a new idea *Fractional Partition*, motivated by the concept of partitions, but directly not related and therefore may not adhere the general properties of partitions. After giving general introduction, we would like give certain properties of *Fractional Partition,* but unable to prove them. However there are conclusive numerical data's and evidence in their support.

If we divide positive natural numbers by certain integers (1, 2, 3, 4, 5, 6, 7, 8, and 9), we find two kind of result as,

I. Some numbers are being divided completely and giving exact values (e. v.)
II. Some numbers are being not divided completely and therefore giving not exact values (n. e. v.).

As example, the divisions of 1 by 1, 2, 3, 4, 5, 6, 7, 8, and 9 are shown below;

1/1= 1.0000	(completely divided and giving e. v.)
1/2 = 0.5000	(completely divided and giving e. v.)
1/3 = 0.3333	(not completely divided and giving n. e. v.)
¼ = 0.2500	(completely divided and giving e. v.)
1/5 = 0.2000	(completely divided and giving e. v.)
1/6 = 0.1666	(not completely divided and giving n. e. v.)
1/7 = 0.1428	(not completely divided and giving n. e. v.)
1/8 = 0.1250	(completely divided and giving e. v.)
1/9 = 0.1111	(not completely divided and giving n. e. v.)

Finally, we calculate the total number of exact values (not their quantities) and with the help of these numbers we would like to introduce the term *Fractional Partition* and denote it by symbol Fp. In case of above example, Fp = 5. In general we would like to say that the *Fractional Partition* of 1 is 5 i.e. total numbers of exact values.

In the given Table, we have computed the *Fractional Partition* (i.e. total no of e. v) for 1 to 50.

Rank of *Fractional Partition*: It is denoted by R-(Fp) and is define as,
R-(Fp) = Fp - minimum e. v.
In the case of above example, we have;
R-(Fp) = 5.000 – 0.125 = 4.8750.

Crank of *Fractional Partition*: It is denoted by C-(Fp) and is defined as,
C-(Fp) = Fp – minimum of n. e. v.
In the case of above example, we have;
C-(Fp) = 5.000 – 0.1111 = 4.8889.

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<u>First Maximum Constant of *Fractional Partition*</u>: We will denote it by Mp(c-i) and define as,

R-(Fp) = Fp – maximum e. v.

In the case of above example, we have;

R-(Fp) = 5.0000 – 1.0000 = 4.0000.

<u>Second Maximum Constant of *Fractional Partition*</u>: We will denote it by Mp(c-ii) and define as,

C-(Fp) = Fp – maximum n. e. v.

In the case of above example, we have;

C-(Fp) = 5.0000 – 0.3333 = 4.6667.

Following Table, containing different values for numbers between 1 to 50 after dividing them by integers (1, 2, 3, 4, 5, 6, 7, 8, and 9). In the table aberrations are exact values (e. v.) and not exact values (n. e. v.). Due to shortage of spaces in few columns exact values are written only up to two decimal places and also not exact values are also written up to three or four places only. We are using m (for e. v.), p (for n. e. v.), c (for total), cm (for number of e. v.), and cp (for number of n. e. v.).

	n/1	n/1	n/2	n/2	n/3	n/3	n/4	n/4	n/5	n/5	n/6	n/6	n/7	n/7	n/8	n/8	n/9	n/9	c	c
n	m	p	m	p	m	p	m	p	m	p	m	p	m	p	m	p	m	p	cm	cp
1	1		0.50			0.333	0.25		0.20			0.166		01428	0.125			0.111	5	4
2	2		1.00			0.666	0.50		0.40			0.333		0.2857	0.250			0.222	5	4
3	3		1.50		1		0.75		0.60		0.50			0.4285	0.375			0.333	7	2
4	4		2.00			1.333	1.00		0.80			0.666		0.5871	0.500			0.444	5	4
5	5		2.50			1.666	1.25		1.00			0.833		0.7142	0.625			0.555	5	4
6	6		3.00		2		1.50		1.20		1.00			0.5555	0.750			1.333	6	3
7	7		3.50			2.333	1.75		1.40			1.166	1		0.875			0.777	6	3
8	8		4.00			2.666	2.00		1.60			1.333		1.428	1.000			0.888	5	4
9	9		4.50		3		2.25		1.80		1.50			1.285	1.120		1		8	1
10	10		5.00			3.333	2.50		2.00			1.666		1.428	1.250			1.111	5	4
11	11		5.50			3.666	2.75		2.20			1.833		1.585	1.375			1.222	5	4
12	12		6.00		4		3.00		2.40		2.00			1.714	1.500			1.333	7	2
13	13		6.50			4.333	3.25		2.60			2.166		1.857	1.625			1.444	5	4
14	14		7.00			4.666	3.50		2.80			2.333	2		1.750			1.555	6	3
15	15		7.50		5		3.75		3.00		2.50			2.142	1.875			1.666	7	2
16	16		8.00			5.333	4.00		3.20			2.666		2.285	2.000			1.777	5	4
17	17		8.50			5.666	4.25		3.40			2.833		2.428	2.125			1.888	6	3
18	18		9.00		6		4.50		3.60		3.00			2.571	2.250		2		8	1
19	19		9.50			6.333	4.75		3.80			3.166		2.714	2.375			2.111	5	4
20	20		10.0			6.666	5.00		4.00			3.333		2.857	2.500			2.222	5	4
21	21		10.5		7		5.25		4.20		3.50		3		2.625			2.333	8	1
22	22		11.0			7.333	5.50		4.40			3.666		3.142	2.750			2.444	5	4
23	23		11.5			7.666	5.75		4.60			3.833		3.285	2.875			2.555	5	4
24	24		12.0		8		6.00		4.80		4.00			3.428	3.000			2.666	7	2
25	25		12.5			8.333	6.25		5.00			4.166		3.571	3.125			2.777	5	4
26	26		13.0			8.666	6.50		5.20			4.333		3.714	3.250			2.888	5	4
27	27		13.5		9		6.75		5.40		4.50			3.587	3.375		3		8	1
28	28		14.0			9.333	7.00		5.60			4.666	4		3.500			3.111	6	3
29	29		14.5			9.666	7.25		5.80			4.833		4.142	3.625			3.222	5	4
30	30		15.0		10		7.50		6.00		5.00			4.285	3.750			3.333	7	2
31	31		15.5			10.33	7.75		6.20			5.166		4.428	3.875			3.444	5	4
32	32		16.0			10.66	8.00		6.40			5.333		4.571	4.000			3.555	5	4
33	33		16.5		11		8.25		6.60		5.50			4.712	4.125			3.666	7	2
34	34		17.0			11.33	8.50		6.80			5.666		4.857	4.250			3777	5	4
35	35		17.5			11.66	8.75		7.00			5.833	5		4.375			3.888	6	3
36	36		18.0		12		9.00		7.20		6.00			5.142	4.500		4		8	1
37	37		18.5			12.33	9.25		7.40			6.166		5.285	4.625			4.111	5	4
38	38		19.0			12.66	9.50		7.60			6.333		5.428	4.750			4.222	5	4
39	39		19.5		13		9.75		7.80		6.50			5.571	4.875			4.333	7	2
40	40		20.0			13.33	10.0		8.00			6.666		5.571	5.000			4.444	5	4
41	41		20.5			13.66	10.2		8.20			6.833		5.857	5.125			4.555	5	4
42	42		21.0		14		10.5		8.40		7.00		6		5.250			4.666	8	1
43	43		21.5			14.33	10.7		8.60			7.166		6.142	5.375			4.777	5	4
44	44		22.0			14.66	11.0		8.80			7.333		6.285	5.500			4.888	5	4
45	45		22.5		15		11.2		9.00		7.50			6.428	5.625		5		8	1
46	46		23.0			15.33	11.5		9.20			7.666		6.571	5.750			5.111	6	3
47	47		23.5			15.66	11.7		9.40			7.833		6.714	5.875			5.222	5	4
48	48		24.0		16		12.0		9.60		8.00			6.857	6.000			5.333	7	2
49	49		24.5			16.33	12.2		9.80			8.166	7		6.125			5.444	6	3
50	50		25.0			16.66	12.5		10.0			8.333		7.142	6.250			5.555	5	4

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REFERENCE:

This idea is motivated by the work of F. Dyson, Eureka, 8, 1944, 10-15.

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