

Corrigendum: An unusual cubic representation problem

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Abstract. We correct some errors in Table 2 of the paper “*An unusual cubic representation problem*” by Bremner & Macleod [3].

For a given positive integer N , the paper Bremner & Macleod [3] considers the smallest positive integers a, b, c such that

$$\frac{a}{b+c} + \frac{b}{c+a} + \frac{c}{a+b} = N. \quad (1)$$

Table 2 of the paper lists the maximum number of digits of a, b, c for the smallest corresponding solution of (1), in the range $4 \leq N \leq 200$. Xianwen Wang points out to us that several of these maximum values are incorrect. We have re-computed the Table 2, and a corrected table is given below, with an asterisk attached to a value of N where the maximum was incorrectly computed.

We cannot explain these errors, other than through incompetence. We publish this correction not only to set the record straight, but also because the paper gave rise to an internet meme and viral following based on the result for $N = 4$, with an apple, a banana, and a pineapple replacing a, b, c . In this instance, a, b, c have 79, 80, 81 digits. See the web reference [1] and Amit [2].

Table 2. The maximum number of digits in a, b, c in the range $1 \leq N \leq 200$.

N	m	# digits	N	m	# digits	N	m	# digits
4	9	81	48	311	418086	136	65	26942
6	11	134	58	221	244860	146	307	259164
10	13	190	60	61	9188	156*	353	5231784
12	35	2707	66	107	215532	158*	1211	6556665
14	47	1876	76	65	23662	162*	457	549410
16	11	414	82	157	85465	178*	2945	173112152
18	49	10323	92	321	252817	182*	853	1228524
24	107	33644	102	423	625533	184*	851	9020686
28	121	81853	112	223	935970	186*	643	2363860
32	65	14836	116	101	112519	196*	701	4917528
38	659	1584369	126	75	196670	198	121	726373
42	419	886344	130*	707	3722878	200*	2957	30932746
46	201	198771	132*	461	1566907			

References

- [1] URL: <https://www.reddit.com/r/mathmemes/comments/11h1cos/diophantineapple>.
- [2] URL: <https://www.quora.com/How-do-you-find-the-positive-integer-solutions-to-fraction-c-x-y+z+-frac-y-z+x+-frac-z-x+y-4>.
- [3] A. BREMNER, A. MACLEOD: *An unusual cubic representation problem*, Annales Mathematicae et Informaticae 43 (2014), pp. 29–41.