More Amicable Numbers

By Paul Bratley and John McKay

A recent paper [1] listed all pairs of amicable numbers below 10^6 . The following extension contains all amicable pairs with the lesser number between 10^6 and 10^7 . Pairs marked with an asterisk are not found in the lists given by Escott [2], Poulet [3], and Garcia [4]. However, our referee has kindly pointed out that 22 of these pairs appear in a paper by Lee [5] which was in the process of publication. The 16 pairs marked † appear to be new, and complete the list of 108 pairs less than 10^7 .

*1077890 = $2 \cdot 5 \cdot 11 \cdot 41 \cdot 239$	1099390 = $2 \cdot 5 \cdot 17 \cdot 29 \cdot 223$
1154450 = $2 \cdot 5^2 \cdot 11 \cdot 2099$	1189150 = $2 \cdot 5^2 \cdot 17 \cdot 1399$
1156870 = $2 \cdot 5 \cdot 11 \cdot 13 \cdot 809$	1292570 = $2 \cdot 5 \cdot 19 \cdot 6803$
1175265 = $3^2 \cdot 5 \cdot 7^2 \cdot 13 \cdot 41$	1438983 = $3^2 \cdot 7^2 \cdot 13 \cdot 251$
1185376 = $2^5 \cdot 17 \cdot 2179$	1286744 = $2^3 \cdot 41 \cdot 3923$
1280565 = $3^2 \cdot 5 \cdot 11 \cdot 13 \cdot 199$	1340235 = $3^2 \cdot 5 \cdot 13 \cdot 29 \cdot 79$
*1328470 = $2 \cdot 5 \cdot 11 \cdot 13 \cdot 929$	1483850 = $2 \cdot 5^2 \cdot 59 \cdot 503$
1358595 = $3^2 \cdot 5 \cdot 7 \cdot 19 \cdot 227$	1486845 = $3^2 \cdot 5 \cdot 19 \cdot 37 \cdot 47$
1392368 = $2^4 \cdot 17 \cdot 5119$	1464592 = $2^4 \cdot 239 \cdot 383$
*1466150 = $2 \cdot 5^2 \cdot 7 \cdot 59 \cdot 71$	1747930 = $2 \cdot 5 \cdot 47 \cdot 3719$
†1468324 = $2^2 \cdot 11 \cdot 13 \cdot 17 \cdot 151$	1749212 = $2^2 \cdot 37 \cdot 53 \cdot 223$
1511930 = $2 \cdot 5 \cdot 7 \cdot 21599$	1598470 = $2 \cdot 5 \cdot 19 \cdot 47 \cdot 179$
*1669910 = $2 \cdot 5 \cdot 11 \cdot 17 \cdot 19 \cdot 47$	2062570 = $2 \cdot 5 \cdot 239 \cdot 863$
†1798875 = $3^3 \cdot 5^3 \cdot 13 \cdot 41$	1870245 = $3^2 \cdot 5 \cdot 13 \cdot 23 \cdot 139$
2082464 = $2^5 \cdot 59 \cdot 1103$	2090656 = $2^5 \cdot 79 \cdot 827$
*2236570 = $2 \cdot 5 \cdot 7 \cdot 89 \cdot 359$	2429030 = $2 \cdot 5 \cdot 23 \cdot 59 \cdot 179$
2652728 = $2^3 \cdot 13 \cdot 23 \cdot 1109$	2941672 = $2^3 \cdot 71 \cdot 5179$
2723792 = $2^4 \cdot 37 \cdot 43 \cdot 107$	2874064 = $2^4 \cdot 263 \cdot 683$
*2728726 = $2 \cdot 7 \cdot 11 \cdot 13 \cdot 29 \cdot 47$	3077354 = $2 \cdot 7 \cdot 19 \cdot 23 \cdot 503$
2739704 = $2^3 \cdot 11 \cdot 163 \cdot 191$	2928136 = $2^3 \cdot 31 \cdot 11807$
2802416 = $2^4 \cdot 17 \cdot 10303$	2947216 = $2^4 \cdot 167 \cdot 1103$
†2803580 = $2^2 \cdot 5 \cdot 13 \cdot 41 \cdot 263$	3716164 = $2^2 \cdot 503 \cdot 1847$
3276856 = $2^3 \cdot 11 \cdot 23 \cdot 1619$	3721544 = $2^3 \cdot 647 \cdot 719$
†3606850 = $2 \cdot 5^2 \cdot 13 \cdot 31 \cdot 179$	3892670 = $2 \cdot 5 \cdot 29 \cdot 31 \cdot 433$
3786904 = $2^3 \cdot 11 \cdot 23 \cdot 1871$	4300136 = $2^3 \cdot 467 \cdot 1151$
3805264 = $2^4 \cdot 29 \cdot 59 \cdot 139$	4006736 = $2^4 \cdot 179 \cdot 1399$
†4238984 = $2^3 \cdot 17 \cdot 71 \cdot 439$	4314616 = $2^3 \cdot 23 \cdot 131 \cdot 179$
4246130 = $2 \cdot 5 \cdot 7 \cdot 60659$	4488910 = $2 \cdot 5 \cdot 23 \cdot 29 \cdot 673$
*4259750 = $2 \cdot 5^3 \cdot 11 \cdot 1549$	4445050 = $2 \cdot 5^2 \cdot 19 \cdot 4679$
4482765 = $3^2 \cdot 5 \cdot 7^2 \cdot 19 \cdot 107$	5120595 = $3^2 \cdot 5 \cdot 19 \cdot 53 \cdot 113$
4532710 = $2 \cdot 5 \cdot 7 \cdot 13 \cdot 17 \cdot 293$	6135962 = $2 \cdot 7 \cdot 71 \cdot 6173$
*4604776 = $2^3 \cdot 11^2 \cdot 67 \cdot 71$	5162744 = $2^3 \cdot 113 \cdot 5711$
*5123090 = $2 \cdot 5 \cdot 7 \cdot 163 \cdot 449$	5504110 = $2 \cdot 5 \cdot 19 \cdot 59 \cdot 491$

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$5147032 = 2^3 \cdot 11 \cdot 23 \cdot 2543$	$5843048 = 2^3 \cdot 383 \cdot 1907$
$\dagger * 5232010 = 2 \cdot 5 \cdot 7 \cdot 41 \cdot 1823$	$5799542 = 2 \cdot 7^2 \cdot 23 \cdot 31 \cdot 83$
$* 5357625 = 3 \cdot 5^3 \cdot 7 \cdot 13 \cdot 157$	$5684679 = 3^2 \cdot 7 \cdot 11 \cdot 13 \cdot 631$
$\dagger * 5385310 = 2 \cdot 5 \cdot 7 \cdot 107 \cdot 719$	$5812130 = 2 \cdot 5 \cdot 17 \cdot 179 \cdot 191$
$* 5459176 = 2^3 \cdot 17 \cdot 137 \cdot 293$	$5495264 = 2^5 \cdot 83 \cdot 2069$
$\dagger * 5726072 = 2^3 \cdot 11 \cdot 31 \cdot 2099$	$6369928 = 2^3 \cdot 79 \cdot 10079$
$* 5730615 = 3^3 \cdot 5 \cdot 11 \cdot 17 \cdot 227$	$6088905 = 3^3 \cdot 5 \cdot 23 \cdot 37 \cdot 53$
$\dagger * 5864660 = 2^2 \cdot 5 \cdot 17 \cdot 47 \cdot 367$	$7489324 = 2^2 \cdot 53 \cdot 35327$
$* 6329416 = 2^3 \cdot 23 \cdot 41 \cdot 839$	$6371384 = 2^3 \cdot 19 \cdot 167 \cdot 251$
$* 6377175 = 3^2 \cdot 5^2 \cdot 7 \cdot 4049$	$6680025 = 3^2 \cdot 5^2 \cdot 11 \cdot 2699$
$6955216 = 2^4 \cdot 19 \cdot 137 \cdot 167$	$7418864 = 2^4 \cdot 463679$
$6993610 = 2 \cdot 5 \cdot 13 \cdot 23 \cdot 2339$	$7158710 = 2 \cdot 5 \cdot 13 \cdot 53 \cdot 1039$
$\dagger * 7275532 = 2^2 \cdot 11 \cdot 37 \cdot 41 \cdot 109$	$7471508 = 2^2 \cdot 11^2 \cdot 43 \cdot 359$
$* 7288930 = 2 \cdot 5 \cdot 11 \cdot 23 \cdot 43 \cdot 67$	$8221598 = 2 \cdot 7 \cdot 11 \cdot 197 \cdot 271$
$* 7489112 = 2^3 \cdot 17 \cdot 53 \cdot 1039$	$7674088 = 2^3 \cdot 23 \cdot 179 \cdot 233$
$* 7577350 = 2 \cdot 5^2 \cdot 11 \cdot 23 \cdot 599$	$8493050 = 2 \cdot 5^2 \cdot 59 \cdot 2879$
$7677248 = 2^6 \cdot 139 \cdot 863$	$7684672 = 2^6 \cdot 167 \cdot 719$
$7800544 = 2^5 \cdot 43 \cdot 5669$	$7916696 = 2^3 \cdot 17 \cdot 58211$
$* 7850512 = 2^4 \cdot 37 \cdot 89 \cdot 149$	$8052488 = 2^3 \cdot 29 \cdot 61 \cdot 569$
$* 8262136 = 2^3 \cdot 17 \cdot 79 \cdot 769$	$8369864 = 2^3 \cdot 29 \cdot 43 \cdot 839$
$\dagger * 8619765 = 3 \cdot 5 \cdot 7 \cdot 11 \cdot 17 \cdot 439$	$9627915 = 3 \cdot 5 \cdot 11 \cdot 23 \cdot 43 \cdot 59$
$* 8666860 = 2^2 \cdot 5 \cdot 23 \cdot 83 \cdot 227$	$10638356 = 2^2 \cdot 47 \cdot 71 \cdot 797$
$8754130 = 2 \cdot 5 \cdot 7 \cdot 11 \cdot 11369$	$10893230 = 2 \cdot 5 \cdot 757 \cdot 1439$
$\dagger * 8826070 = 2 \cdot 5 \cdot 11 \cdot 19 \cdot 41 \cdot 103$	$10043690 = 2 \cdot 5 \cdot 31 \cdot 179 \cdot 181$
$9071685 = 3^2 \cdot 5 \cdot 7 \cdot 31 \cdot 929$	$9498555 = 3^2 \cdot 5 \cdot 11 \cdot 31 \cdot 619$
$9199496 = 2^3 \cdot 19 \cdot 29 \cdot 2087$	$9592504 = 2^3 \cdot 29 \cdot 173 \cdot 239$
$\dagger * 9206925 = 3 \cdot 5^2 \cdot 7 \cdot 13 \cdot 19 \cdot 71$	$10791795 = 3 \cdot 5 \cdot 7 \cdot 79 \cdot 1301$
$* 9339704 = 2^3 \cdot 11 \cdot 211 \cdot 503$	$9892936 = 2^3 \cdot 47 \cdot 83 \cdot 317$
$9363584 = 2^7 \cdot 191 \cdot 383$	$9437056 = 2^7 \cdot 73727$
$\dagger * 9478910 = 2 \cdot 5 \cdot 7 \cdot 19 \cdot 7127$	$11049730 = 2 \cdot 5 \cdot 71 \cdot 79 \cdot 197$
$\dagger * 9491625 = 3^2 \cdot 5^3 \cdot 11 \cdot 13 \cdot 59$	$10950615 = 3^2 \cdot 5 \cdot 13 \cdot 18719$
$* 9660950 = 2 \cdot 5^2 \cdot 13 \cdot 89 \cdot 167$	$10025290 = 2 \cdot 5 \cdot 11 \cdot 91139$
$\dagger * 9773505 = 3^2 \cdot 5 \cdot 7 \cdot 19 \cdot 23 \cdot 71$	$11791935 = 3^2 \cdot 5 \cdot 31 \cdot 79 \cdot 107$

It is conjectured that all odd amicable numbers are divisible by 3. (The apparent counterexample on p. 168 of Garcia's paper is a misprint, the common factor 2^3 being missing.)

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