RICHARD P. BRENT, Australian National University, Canberra, ACT 2600, Australia. New factors of Mersenne numbers. Preliminary report.

The following factors of Mersenne numbers $M_k = 2^k - 1$ have been found. Factors given in parentheses were already known. prpN (resp. cN) denotes a number of N decimal digits which is probably prime (resp. composite).

k	$M_k = 2^k - 1$
283	(9623).68492481833.prp71
331	16937389168607.(86511880293 6559).prp72
337	(18199.2806537).9576 3203297.726584894969.prp68
367	(12479.5179104l).781385818 82953.c85
379	18081880808679.prp103
401	85697l565399.c109
409	4480666067023.760256266898 33.prp97
419	(839).90378002161 3921.c109
439	(104110607).1273214 91658223.c111
443	(887).20781899065 3657.prp117
449	(1256303).687119748 6841.c117
491	(983.7707719).11009743 6327057.c124
691	906642603313.c197
733	6946535257 43.c209

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New factors of Mersenne numbers, II. Preliminary report.

The following factors of Mersenne numbers $M_k = 2^k - 1$ have been found since my first report (these Abstracts 2(1981), 367, 81T-10-246). Factors given in parentheses were already known. pN (cN) denotes a number of N decimal digits which is prime (resp. composite). The new factors of M_{617} and M_{797} were found independently by H. Suyama and the author.

$$M_k = 2^k - 1$$

k	
229	(1504073.20492753).5983345746497018346779512018758372353428000034874323236593
431	(863.3449.36238481.76859369.558062249.46421527 37).1428503127990174521 69.p70
433	22086765417396827057.c112
439	(104110607.12732149165822 3).12255175273300305543.p90
461	(2767).358288564417709 27.c118
463	(11113.3407681).448747600991881.c115
503	321368498497927 9.c136
587	(554129.2926783).73208283304744901303.c145
617	(59233).6895412329 7.c171
797	(200685875 3).5457336 9937.c220

The largest factors p71, p72, p68 and p97 of M_{283}, M_{331}, M_{337}, and M_{409} respectively have been shown to be prime by H. C. Williams and the author. They were previously given as "probably prime".

RICHARD P. BRENT, Australian National University, Canberra, ACT 2600, Australia. New factors of Mersenne numbers, III. Preliminary report.

The following factors of Mersenne numbers $M_k = 2^k - 1$ have been found or proved prime since my earlier report (these Abstracts 3(1982), 132, 82T-10-34). Factors given in parentheses were already known; others are new or were not previously known to be prime. pN (cN) denotes a number of N decimal digits which is prime (resp. composite). M_{227} is the last of Mersenne's original numbers which was known to be composite, but for which no factor was known. An asterisk indicates that primality was proved by H. Cohen and H. W. Lenstra.

$$M_k = 2^k - 1$$

k	
227	26986334343777017.79921777382059796264915069508677209535456601121688631
373	(25569151).p105*
379	(18081880808679).p103*
509	(12619129).19089479845124902223.c127
541	(431279030327).611520994009.c141
577	(3463).13230577431697.p157*
587	(554129.2926783).394833307666889.(73208283304744901303).c132
613	445994768330089207.c168
619	(110183).710820995447.c170
659	(1319).115274292775326482441.c177
677	(19431186631).531132717139346021081.c174