Tables of sizes of random complete arcs in the plane $PG(2, q)$

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Abstract

Tables of sizes of random complete arcs in the plane $PG(2, q)$ are given. The sizes are close to the smallest known sizes of complete arcs in $PG(2, q)$, in particular, to ones constructed by Algorithm FOP (fixed order of points). The random arcs are obtained in the region $\{3 \leq q \leq 46337, \ q \text{ prime}\}$.

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1 Introduction

Let $PG(2, q)$ be the projective plane over the Galois field $F_q$. An $n$-arc is a set of $n$ points no three of which are collinear. An $n$-arc is called complete if it is not contained in an $(n+1)$-arc of $PG(2, q)$. For an introduction to projective geometries over finite fields see [30,47,49].

In [32,55] the close relationship among the theory of $n$-arcs, coding theory, and mathematical statistics is presented. In particular, a complete arc in a plane $PG(2, q)$, the points
of which are treated as 3-dimensional $q$-ary columns, defines a parity check matrix of a $q$-ary linear code with codimension 3, Hamming distance 4, and covering radius 2. Arcs can be interpreted as linear maximum distance separable (MDS) codes [53, Sec. 7], [56] and they are related to optimal coverings arrays [28] and to superregular matrices [33].

One of the main problems in the study of projective planes, which is also of interest in coding theory, is finding of the spectrum of possible sizes of complete arcs. In particular, the value of $t_2(2, q)$, the smallest size of a complete arc in $PG(2, q)$, is interesting. Finding estimates of the minimum size $t_2(2, q)$ is a hard open problem.

This work is devoted to random complete arcs in $PG(2, q)$ and to the comparison of their sizes with upper bounds on $t_2(2, q)$.

Surveys of results on the sizes of plane complete arcs, methods of their construction, and comprehension of the relating properties can be found in [4,6–10,12,16,17,22,29,30,32,34,37,41,43–45,47–54]. Some problems connected with small complete plane arcs are considered in [1,3–5,9,10,18,19,23–26,29,30,32,34,35,40,42,46,57].

The exact values of $t_2(2, q)$ are known only for $q \leq 32$; see [2,21,27,30,31,36,38,39] and work [13] where the equalities $t_2(2, 31) = t_2(2, 32) = 14$ are established.

Let $t(P_q)$ be the size of the smallest complete arc in any (not necessarily Galois) projective plane $P_q$ of order $q$. In [34], for sufficiently large $q$, the following result is proven by probabilistic methods (we give it in the form of [32, Table 2.6] taking into account that all logarithms in [34] have natural base, see [34, p. 10]):

$$t(P_q) \leq D \sqrt{q} \ln C, \quad C \leq 300,$$

(1.1)

where $C$ and $D$ are constants independent of $q$ (so-called universal or absolute constants). The authors of [34] conjecture that the constant can be reduced to $C = 10$. A survey and an analysis of random constructions for geometrical objects can be found in [24]; see also the references therein.

Regarding complete arcs of sizes smaller $\frac{1}{4}q$ obtained by algebraic constructions, following [32, p. 209], complete arcs in $PG(2, q)$ have been constructed with sizes approximately $\frac{1}{3}q$ (see [1,6,34,50,51,57]), $\frac{1}{4}q$ (see [6,35,52]), $2q^{0.9}$ (see [50] where such arcs are constructed for $q > 7^{10}$). It is noted in [24, Sec. 8], that the smallest size of a complete arc in $PG(2, q)$ obtained via algebraic constructions is $cq^{3/4}$ where $c$ is a universal constant; see [52, Sec. 3] and [53, Th. 6.8].

In [6,7], for large ranges of $q$, the form of the bound of (1.1) is applied but the value of the constant $C$ was essentially reduced to $C = 0.75$ [6] and to $C = 0.73$ [7] whereas $D < 1$. In particular, the following results are obtained in [6,7] using randomized greedy algorithms:

$$t_2(2, q) < \sqrt{q} \ln^{0.75} q \quad \text{for} \quad 23 \leq q \leq 5107 \quad [6];$$

(1.2)

$$t_2(2, q) < \sqrt{q} \ln^{0.73} q \quad \text{for} \quad 109 \leq q \leq 13627 \quad [7].$$

(1.3)
In [5], the smallest known sizes of complete arcs in $PG(2, q)$ (up to November 2013) are collected for the following huge region $H$:

$$H = \{ q : 173 \leq q \leq 49727, \text{q power prime}\} \cup \{ q : 173 \leq q \leq 125003, \text{q prime}\} \cup \{ 59 \text{ sporadic prime q’s in the interval [125101...360007], see [5 Table 7]}. \}

The data collected in [5–7] provide the following result.

$$t_2(2, q) < \sqrt{q} \ln^{0.7295} q \text{ for } 109 \leq q \leq 169 \text{ and } q \in H. \quad (1.5)$$

In the recent works of the authors, see [10–12], a new Algorithm FOP (fixed order of points) constructing small complete arcs in $PG(2, q)$ is proposed. Lexicographical and the Singer fixed orders of points are investigated. We denote

$$L = \{ q : 3 \leq q \leq 67993, \text{q prime}\} \cup \{ 43 \text{ sporadic prime q’s in [69997...190027]} \}; \quad (1.6)$$

$$S = \{ q : 5 \leq q \leq 40009, \text{q prime}\}. \quad (1.7)$$

Let $t^L_2(2, q)$ be the size of complete arcs in $PG(2, q)$ obtained by Algorithm FOP with Lexicographical order of points. Let $t^S_2(2, q)$ be the size of complete arcs in $PG(2, q)$ obtained by Algorithm FOP with Singer order of points. Values of $t^L_2(2, q)$ in the region $L$ and $t^S_2(2, q)$ in the region $S$ are collected in [9].

The data collected in [9] provide the following upper bounds on $t_2(2, q)$:

$$t_2(2, q) < t^L_2(2, q) < 1.83 \sqrt{q \ln q} \text{ if } q \in L; \quad (1.8)$$

$$t_2(2, q) < t^S_2(2, q) < 1.83 \sqrt{q \ln q} \text{ if } q \in S. \quad (1.9)$$

In [14, 34] it is noted that, in a preliminary report in 1989, J. C. Fisher obtained by computer search complete arcs in many planes of small orders and conjectured that average size of a complete arc is about

$$\sqrt{3q \log q}. \quad (1.10)$$

We denote

$$R = \{ 3 \leq q \leq 46337, \text{q prime}\}. \quad (1.11)$$

In this work, we collect the sizes $t^R_2(2, q)$ of random complete arcs in $PG(2, q)$ in the region $R$. The collected sizes are represented in Table 1 and in Figure 1. For comparison, we also give Figures 2 and 3 with the sizes $t^L_2(2, q)$ and $t^S_2(2, q)$ of complete arcs obtained by Algorithm FOP with Lexicographical and Singer orders of points. Finally, we represent differences $t^L_2(2, q) - t^R_2(2, q)$ and $t^S_2(2, q) - t^R_2(2, q)$ in Figures 4 and 5.
The random arcs are obtained in this work with the help of a random generator used in a C++ program under the system Linux. A complete arc is constructed step-by-step in a random manner. At every step a point of the plane is selected randomly: if the point is not covered by bisecants of the arc, then it is added to the arc; otherwise, another point is selected. The process stops when a complete arc is obtained.

From Table 1 and Figure 1 it follows that

$$t^R_2(2, q) < 1.83\sqrt{q\ln q} \text{ if } q \in R.$$ (1.12)

So, the sizes of random arcs in the region $R$ satisfy the upper bounds on $t_2(2, q)$ given in (1.8), (1.9). One can say also that the conjecture (1.10) holds in the region $R$, see Figure 1.

2 Table. Figures

The sizes $t^R_2 = t^R_2(2, q)$ of random complete arcs in planes $PG(2, q)$, $3 \leq q \leq 46337$, $q$ prime, are shown in Table 1, see pp. 10–32.

In Figure 1 values $t^R_2(2, q)/\sqrt{q\ln q}$, $q \in R$, are shown. The values oscillate around line $y = 1.803$; it means that the conjecture (1.10) holds in the region $R$.

We denote

$$L^\# = \{195023, 200003, 205019, 210011, 215051, 220009, 225023, 230003\}. \quad (2.1)$$

Sizes $t^L_2(2, q)$ of small complete arcs in $PG(2, q)$ obtained by Algorithm FOP with Lexicographical order in the region $L^\#$ are obtained in this work. Values $t^L_2(2, q)$ corresponding to $q$’s of (2.1) are as follows:

$$\{2781, 2822, 2864, 2886, 2938, 2958, 3002, 3033\}. \quad (2.2)$$

In Figure 2 values $t^L_2(2, q)/\sqrt{q\ln q}$, $q \in L \cup L^\#$, are shown. In Figure 3 values $t^S_2(2, q)/\sqrt{q\ln q}$, $q \in S$, are given.

One can see that Figures 1 and 2, 3 have the very similar structures. It is expected, as Lexicographical order of points is a random order in the geometrical sense. Singer order, of course, has a geometrical sense but this sense is not connected with constructing of arcs and with covering of points by bisecants. It is why Singer order also may be treated as a random order.

In Figures 4 and 5 the differences $t^L_2(2, q) - t^R_2(2, q)$ and $t^S_2(2, q) - t^S_2(2, q)$ in percentage are represented. We show values $\frac{t^L_2(2, q) - t^R_2(2, q)}{t^L_2(2, q)}100\%$ in the region $R$ and values of $\frac{t^S_2(2, q) - t^R_2(2, q)}{t^S_2(2, q)}100\%$ in the region $S$. Note that the differences are less than 3% for $q > 3000.$
Figure 1: **Bound** $1.83\sqrt{q\ln q}$ vs random complete arcs. $y = 1.83$ (the top solid line); $y = 1.803$ (the 2-nd dashed line); values $\frac{t_2^R(2,q)}{\sqrt{q\ln q}}$, $q \in R$, where $t_2^R(2,q)$ is the size of a random complete arc (the solid curve).
Figure 2: Bound $1.83\sqrt{q \ln q}$ vs Algorithm’s FOP Lexicographical results. $y = 1.83$ (the top solid line); $y = 1.803$ (the 2-nd dashed line); values $t^L_2(2, q)/\sqrt{q \ln q}$, $q \in L \cup L^\#$, where $t^L_2(2, q)$ is the size of a complete arc obtained by Algorithm FOP with Lexicographical order of points (the solid curve).
Figure 3: **Bound** $1.83 \sqrt{q \ln q}$ vs Algorithm’s FOP Singer results. $y = 1.83$ (the top solid line); $y = 1.803$ (the 2-nd dashed line); values $t_2^S(2, q)/\sqrt{q \ln q}$, $q \in S$, where $t_2^S(2, q)$ is the size of a complete arc obtained by Algorithm FOP with Singer order of points (the solid curve)
Figure 4: Difference $t_{L}^{2}(2, q) - t_{R}^{2}(2, q)$ in percentage. $\frac{t_{L}^{2}(2, q) - t_{R}^{2}(2, q)}{t_{L}^{2}(2, q)} \times 100\%$, $q \in R$ (the solid curve)
Figure 5: Difference $t^S_2(2, q) - t^R_2(2, q)$ in percentage. $\frac{t^S_2(2, q) - t^R_2(2, q)}{t^R_2(2, q)} \times 100\%$, $q \in S$ (the solid curve)
Table 1 The sizes $t^R_2 = t^R_2(q)$ of random complete arcs in planes $\text{PG}(2,q)$, $3 \leq q \leq 46337$, $q$ prime

| $q$ | $t^R_2$ | $q$ | $t^R_2$ | $q$ | $t^R_2$ | $q$ | $t^R_2$ | $q$ | $t^R_2$ | $q$ | $t^R_2$ |
|-----|--------|-----|--------|-----|--------|-----|--------|-----|--------|-----|--------|
| 3   | 4      | 5   | 6      | 7   | 6      | 11  | 8      | 13  | 10     | 17  | 11     |
| 19  | 13     | 23  | 13     | 29  | 15     | 31  | 16     | 37  | 19     | 41  | 20     |
| 43  | 20     | 47  | 21     | 53  | 24     | 59  | 24     | 61  | 25     | 67  | 28     |
| 71  | 30     | 73  | 28     | 79  | 30     | 83  | 33     | 89  | 34     | 97  | 33     |
| 101 | 37     | 103 | 35     | 107 | 35     | 109 | 36     | 113 | 38     | 127 | 42     |
| 131 | 41     | 137 | 45     | 139 | 44     | 149 | 46     | 151 | 46     | 157 | 47     |
| 163 | 47     | 167 | 48     | 173 | 49     | 179 | 51     | 181 | 52     | 191 | 52     |
| 193 | 56     | 197 | 54     | 199 | 55     | 211 | 58     | 223 | 57     | 227 | 59     |
| 229 | 61     | 233 | 60     | 239 | 61     | 241 | 63     | 251 | 62     | 257 | 63     |
| 263 | 63     | 269 | 66     | 271 | 66     | 277 | 67     | 281 | 68     | 283 | 69     |
| 293 | 68     | 307 | 70     | 311 | 72     | 313 | 72     | 317 | 74     | 331 | 75     |
| 337 | 74     | 347 | 78     | 349 | 79     | 353 | 77     | 359 | 78     | 367 | 81     |
| 373 | 81     | 379 | 82     | 383 | 83     | 389 | 84     | 397 | 84     | 401 | 83     |
| 409 | 83     | 419 | 88     | 421 | 86     | 431 | 90     | 433 | 90     | 439 | 90     |
| 443 | 90     | 449 | 89     | 457 | 91     | 461 | 91     | 463 | 87     | 467 | 93     |
| 479 | 95     | 487 | 96     | 491 | 93     | 499 | 97     | 503 | 96     | 509 | 96     |
| 521 | 98     | 523 | 98     | 541 | 100    | 547 | 102    | 557 | 101    | 563 | 101    |
| 569 | 102    | 571 | 106    | 577 | 105    | 587 | 103    | 593 | 105    | 599 | 107    |
| 601 | 107    | 607 | 108    | 613 | 108    | 617 | 108    | 619 | 107    | 631 | 112    |
| 641 | 109    | 643 | 113    | 647 | 113    | 653 | 111    | 659 | 115    | 661 | 111    |
| 673 | 114    | 677 | 116    | 683 | 116    | 691 | 117    | 701 | 116    | 709 | 118    |
| 719 | 118    | 727 | 120    | 733 | 120    | 739 | 122    | 743 | 122    | 751 | 123    |
| 757 | 121    | 761 | 123    | 769 | 127    | 773 | 126    | 787 | 123    | 797 | 127    |
| 809 | 129    | 811 | 127    | 821 | 129    | 823 | 128    | 827 | 130    | 829 | 132    |
| 839 | 132    | 853 | 131    | 857 | 133    | 859 | 132    | 863 | 133    | 877 | 134    |
| 881 | 135    | 883 | 135    | 887 | 134    | 907 | 135    | 911 | 134    | 919 | 136    |
| 929 | 134    | 937 | 141    | 941 | 141    | 947 | 141    | 953 | 140    | 967 | 141    |
| 971 | 139    | 977 | 143    | 983 | 140    | 991 | 142    | 997 | 146    | 1009 | 148    |
| 1013 | 148    | 1019 | 146    | 1021 | 147    | 1031 | 148    | 1033 | 146    | 1039 | 150    |
| 1049 | 147    | 1051 | 151    | 1061 | 150    | 1063 | 153    | 1069 | 150    | 1087 | 152    |
| 1091 | 155    | 1093 | 149    | 1097 | 155    | 1103 | 156    | 1109 | 155    | 1117 | 154    |
| 1123 | 153    | 1129 | 157    | 1151 | 158    | 1153 | 156    | 1163 | 157    | 1171 | 161    |
| 1181 | 160    | 1187 | 162    | 1193 | 160    | 1201 | 159    | 1213 | 160    | 1217 | 159    |
| 1223 | 164    | 1229 | 164    | 1231 | 166    | 1237 | 161    | 1249 | 167    | 1259 | 164    |
| 1277 | 168    | 1279 | 166    | 1283 | 167    | 1289 | 169    | 1291 | 170    | 1297 | 169    |
Table 1 Continue 1

| $q$  | $t_2^R$ | $q$  | $t_2^R$ | $q$  | $t_2^R$ | $q$  | $t_2^R$ | $q$  | $t_2^R$ |
|------|---------|------|---------|------|---------|------|---------|------|---------|
| 1301 | 170     | 1303 | 170     | 1307 | 170     | 1319 | 174     | 1321 | 170     |
| 1303 | 170     | 1307 | 170     | 1319 | 174     | 1321 | 170     | 1327 | 173     |
| 1307 | 170     | 1303 | 170     | 1309 | 170     | 1311 | 170     | 1313 | 170     |
| 1309 | 170     | 1307 | 170     | 1311 | 170     | 1313 | 170     | 1319 | 174     |
| 1313 | 170     | 1309 | 170     | 1311 | 170     | 1317 | 173     | 1321 | 170     |
| 1317 | 173     | 1313 | 170     | 1319 | 174     | 1321 | 170     | 1327 | 173     |
| 1319 | 174     | 1317 | 173     | 1321 | 170     | 1327 | 173     | 1331 | 178     |
| 1321 | 170     | 1319 | 174     | 1327 | 173     | 1331 | 178     | 1337 | 175     |
| 1327 | 173     | 1321 | 170     | 1329 | 172     | 1331 | 178     | 1337 | 175     |
| 1329 | 172     | 1327 | 173     | 1331 | 178     | 1337 | 175     | 1341 | 179     |
| 1331 | 178     | 1329 | 172     | 1333 | 176     | 1337 | 175     | 1341 | 179     |
| 1333 | 176     | 1331 | 178     | 1337 | 175     | 1341 | 179     | 1347 | 182     |
| 1337 | 175     | 1333 | 176     | 1339 | 177     | 1341 | 179     | 1347 | 182     |
| 1339 | 177     | 1337 | 175     | 1341 | 179     | 1347 | 182     | 1353 | 185     |
| 1341 | 179     | 1339 | 177     | 1343 | 180     | 1347 | 182     | 1353 | 185     |
| 1343 | 180     | 1341 | 179     | 1347 | 182     | 1353 | 185     | 1359 | 188     |
| 1347 | 182     | 1343 | 180     | 1349 | 183     | 1353 | 185     | 1359 | 188     |


Table 1 Continue 2

| $q$  | $t_R^1$ | $q$  | $t_R^2$ | $q$  | $t_R^3$ | $q$  | $t_R^4$ | $q$  | $t_R^5$ |
|------|---------|------|---------|------|---------|------|---------|------|---------|
| 2917 | 268     | 2927 | 271     | 2939 | 271     | 2953 | 272     | 2957 | 267     | 2963 | 269     |
| 2969 | 275     | 2971 | 274     | 2999 | 274     | 3001 | 272     | 3011 | 275     | 3019 | 274     |
| 3023 | 279     | 3037 | 276     | 3041 | 272     | 3049 | 281     | 3061 | 277     | 3067 | 276     |
| 3079 | 275     | 3083 | 279     | 3089 | 281     | 3109 | 279     | 3119 | 285     | 3121 | 283     |
| 3137 | 285     | 3163 | 279     | 3167 | 283     | 3169 | 282     | 3181 | 283     | 3187 | 285     |
| 3191 | 280     | 3203 | 288     | 3209 | 286     | 3217 | 283     | 3221 | 288     | 3229 | 288     |
| 3251 | 287     | 3253 | 290     | 3257 | 289     | 3259 | 289     | 3271 | 290     | 3299 | 290     |
| 3301 | 287     | 3307 | 290     | 3313 | 292     | 3319 | 293     | 3323 | 291     | 3329 | 292     |
| 3331 | 293     | 3343 | 292     | 3347 | 291     | 3359 | 296     | 3361 | 294     | 3371 | 289     |
| 3373 | 299     | 3389 | 292     | 3391 | 295     | 3407 | 293     | 3413 | 292     | 3433 | 296     |
| 3449 | 298     | 3457 | 298     | 3461 | 296     | 3463 | 297     | 3467 | 296     | 3469 | 297     |
| 3491 | 301     | 3499 | 301     | 3511 | 298     | 3517 | 300     | 3527 | 302     | 3529 | 302     |
| 3533 | 304     | 3539 | 304     | 3541 | 305     | 3547 | 301     | 3557 | 307     | 3559 | 302     |
| 3571 | 301     | 3581 | 302     | 3583 | 302     | 3593 | 304     | 3607 | 303     | 3613 | 307     |
| 3617 | 306     | 3623 | 307     | 3631 | 304     | 3637 | 315     | 3643 | 309     | 3659 | 305     |
| 3671 | 309     | 3673 | 307     | 3677 | 310     | 3691 | 309     | 3697 | 308     | 3701 | 310     |
| 3709 | 308     | 3719 | 313     | 3727 | 310     | 3733 | 311     | 3739 | 315     | 3761 | 314     |
| 3767 | 314     | 3769 | 314     | 3779 | 307     | 3793 | 315     | 3797 | 317     | 3803 | 317     |
| 3821 | 320     | 3823 | 319     | 3833 | 318     | 3847 | 320     | 3851 | 319     | 3853 | 321     |
| 3863 | 314     | 3877 | 316     | 3881 | 319     | 3889 | 325     | 3907 | 319     | 3911 | 317     |
| 3917 | 320     | 3919 | 319     | 3923 | 317     | 3929 | 320     | 3931 | 323     | 3943 | 315     |
| 3947 | 320     | 3967 | 322     | 3989 | 329     | 4001 | 320     | 4003 | 327     | 4007 | 328     |
| 4013 | 322     | 4019 | 323     | 4021 | 323     | 4027 | 327     | 4049 | 321     | 4051 | 326     |
| 4057 | 324     | 4073 | 327     | 4079 | 328     | 4091 | 329     | 4093 | 330     | 4099 | 327     |
| 4111 | 329     | 4127 | 325     | 4129 | 332     | 4133 | 329     | 4139 | 326     | 4153 | 333     |
| 4157 | 331     | 4159 | 332     | 4177 | 338     | 4201 | 333     | 4211 | 333     | 4217 | 334     |
| 4219 | 332     | 4229 | 334     | 4231 | 335     | 4241 | 336     | 4243 | 337     | 4253 | 337     |
| 4259 | 334     | 4261 | 336     | 4271 | 340     | 4273 | 337     | 4283 | 338     | 4289 | 337     |
| 4297 | 335     | 4327 | 338     | 4337 | 335     | 4339 | 337     | 4349 | 339     | 4357 | 337     |
| 4363 | 342     | 4373 | 336     | 4391 | 342     | 4397 | 342     | 4409 | 339     | 4421 | 340     |
| 4423 | 346     | 4441 | 344     | 4447 | 344     | 4451 | 344     | 4457 | 346     | 4463 | 346     |
| 4481 | 353     | 4483 | 352     | 4493 | 344     | 4507 | 344     | 4513 | 347     | 4517 | 346     |
| 4519 | 348     | 4523 | 345     | 4547 | 346     | 4549 | 351     | 4561 | 352     | 4567 | 346     |
| 4583 | 353     | 4591 | 347     | 4597 | 349     | 4603 | 349     | 4621 | 354     | 4637 | 350     |
| 4639 | 352     | 4643 | 350     | 4649 | 351     | 4651 | 353     | 4657 | 352     | 4663 | 355     |
| $q$  | $t_2^R$ | $q$  | $t_2^R$ | $q$  | $t_2^R$ | $q$  | $t_{2y}$ | $q$  | $t_2^R$ |
|------|---------|------|---------|------|---------|------|---------|------|---------|
| 4673 | 354     | 4679 | 355     | 4691 | 357     | 4703 | 357     | 4721 | 358     | 4723 | 354     |
| 4729 | 354     | 4733 | 356     | 4751 | 357     | 4759 | 360     | 4783 | 361     | 4787 | 357     |
| 4789 | 362     | 4793 | 357     | 4799 | 362     | 4801 | 360     | 4813 | 360     | 4817 | 361     |
| 4831 | 357     | 4861 | 362     | 4871 | 364     | 4877 | 361     | 4889 | 364     | 4903 | 363     |
| 4909 | 364     | 4919 | 365     | 4931 | 362     | 4933 | 362     | 4937 | 365     | 4943 | 364     |
| 4951 | 367     | 4957 | 363     | 4967 | 368     | 4969 | 368     | 4973 | 365     | 4987 | 365     |
| 4993 | 367     | 4999 | 366     | 5003 | 370     | 5009 | 366     | 5011 | 370     | 5021 | 371     |
| 5023 | 372     | 5039 | 370     | 5051 | 369     | 5059 | 373     | 5077 | 368     | 5081 | 368     |
| 5087 | 369     | 5099 | 370     | 5101 | 372     | 5107 | 368     | 5113 | 371     | 5119 | 375     |
| 5147 | 372     | 5153 | 372     | 5167 | 373     | 5171 | 371     | 5179 | 378     | 5189 | 375     |
| 5197 | 375     | 5209 | 373     | 5227 | 372     | 5231 | 380     | 5233 | 370     | 5237 | 377     |
| 5261 | 379     | 5273 | 378     | 5279 | 383     | 5281 | 378     | 5297 | 381     | 5303 | 381     |
| 5309 | 378     | 5323 | 376     | 5333 | 381     | 5347 | 382     | 5351 | 383     | 5381 | 383     |
| 5387 | 386     | 5393 | 380     | 5399 | 381     | 5407 | 383     | 5413 | 384     | 5417 | 382     |
| 5419 | 384     | 5431 | 384     | 5437 | 386     | 5441 | 384     | 5443 | 387     | 5449 | 385     |
| 5471 | 386     | 5477 | 385     | 5479 | 387     | 5483 | 388     | 5501 | 391     | 5503 | 388     |
| 5507 | 386     | 5519 | 392     | 5521 | 388     | 5527 | 388     | 5531 | 390     | 5557 | 387     |
| 5563 | 389     | 5569 | 393     | 5573 | 390     | 5581 | 393     | 5591 | 391     | 5623 | 391     |
| 5639 | 397     | 5641 | 393     | 5647 | 392     | 5651 | 392     | 5653 | 391     | 5657 | 393     |
| 5659 | 393     | 5669 | 392     | 5683 | 400     | 5689 | 392     | 5693 | 399     | 5701 | 394     |
| 5711 | 397     | 5717 | 400     | 5737 | 400     | 5741 | 395     | 5743 | 393     | 5749 | 400     |
| 5779 | 400     | 5783 | 397     | 5791 | 402     | 5801 | 400     | 5807 | 401     | 5813 | 402     |
| 5821 | 401     | 5827 | 402     | 5839 | 405     | 5843 | 403     | 5849 | 402     | 5851 | 402     |
| 5857 | 402     | 5861 | 405     | 5867 | 400     | 5869 | 399     | 5879 | 402     | 5881 | 400     |
| 5897 | 407     | 5903 | 405     | 5923 | 404     | 5927 | 403     | 5939 | 401     | 5953 | 409     |
| 5981 | 403     | 5987 | 407     | 6007 | 407     | 6011 | 408     | 6029 | 410     | 6037 | 412     |
| 6043 | 410     | 6047 | 403     | 6053 | 403     | 6067 | 408     | 6073 | 410     | 6079 | 409     |
| 6089 | 409     | 6091 | 411     | 6101 | 409     | 6113 | 409     | 6121 | 414     | 6131 | 414     |
| 6133 | 416     | 6143 | 412     | 6151 | 410     | 6163 | 413     | 6173 | 418     | 6197 | 418     |
| 6199 | 414     | 6203 | 417     | 6211 | 414     | 6217 | 418     | 6221 | 412     | 6229 | 416     |
| 6247 | 415     | 6257 | 413     | 6263 | 414     | 6269 | 419     | 6271 | 418     | 6277 | 412     |
| 6287 | 420     | 6299 | 415     | 6301 | 421     | 6311 | 414     | 6317 | 419     | 6323 | 419     |
| 6329 | 420     | 6337 | 421     | 6343 | 418     | 6353 | 422     | 6359 | 422     | 6361 | 416     |
| 6367 | 415     | 6373 | 422     | 6379 | 422     | 6389 | 422     | 6397 | 425     | 6421 | 425     |
| 6427 | 423     | 6449 | 426     | 6451 | 424     | 6469 | 424     | 6473 | 428     | 6481 | 431     |
| $q$ | $t_{i_1}^R$ | $q$ | $t_{i_2}^R$ | $q$ | $t_{i_3}^R$ | $q$ | $t_{i_4}^R$ |
|-----|-------------|-----|-------------|-----|-------------|-----|-------------|
| 6491 | 427        | 6521 | 423        | 6529 | 426        | 6547 | 427        | 6551 | 425        | 6553 | 432        |
| 6563 | 423        | 6569 | 431        | 6571 | 429        | 6577 | 432        | 6581 | 425        | 6599 | 427        |
| 6607 | 434        | 6619 | 432        | 6637 | 431        | 6653 | 429        | 6659 | 435        | 6661 | 429        |
| 6673 | 435        | 6679 | 431        | 6689 | 435        | 6691 | 434        | 6701 | 434        | 6703 | 428        |
| 6709 | 434        | 6719 | 435        | 6733 | 438        | 6737 | 437        | 6761 | 435        | 6763 | 441        |
| 6779 | 439        | 6781 | 436        | 6791 | 435        | 6793 | 437        | 6803 | 433        | 6823 | 436        |
| 6827 | 437        | 6829 | 436        | 6833 | 432        | 6841 | 437        | 6857 | 441        | 6863 | 440        |
| 6869 | 440        | 6871 | 439        | 6883 | 439        | 6899 | 443        | 6907 | 439        | 6911 | 438        |
| 6917 | 447        | 6947 | 441        | 6949 | 443        | 6959 | 442        | 6961 | 443        | 6967 | 449        |
| 6971 | 447        | 6977 | 446        | 6983 | 447        | 6991 | 447        | 6997 | 449        | 7001 | 442        |
| 7013 | 447        | 7019 | 445        | 7027 | 446        | 7039 | 445        | 7043 | 447        | 7057 | 448        |
| 7069 | 445        | 7079 | 446        | 7103 | 448        | 7109 | 449        | 7121 | 453        | 7127 | 446        |
| 7129 | 446        | 7151 | 447        | 7159 | 451        | 7177 | 454        | 7187 | 453        | 7193 | 450        |
| 7207 | 453        | 7211 | 457        | 7213 | 448        | 7219 | 453        | 7229 | 454        | 7237 | 450        |
| 7243 | 455        | 7247 | 456        | 7253 | 455        | 7283 | 456        | 7297 | 454        | 7307 | 454        |
| 7309 | 453        | 7321 | 453        | 7331 | 451        | 7333 | 453        | 7349 | 458        | 7351 | 455        |
| 7369 | 459        | 7393 | 461        | 7411 | 463        | 7417 | 456        | 7433 | 469        | 7451 | 456        |
| 7457 | 457        | 7459 | 465        | 7477 | 458        | 7481 | 458        | 7487 | 459        | 7489 | 465        |
| 7499 | 463        | 7507 | 459        | 7517 | 467        | 7523 | 462        | 7529 | 467        | 7537 | 461        |
| 7541 | 466        | 7547 | 462        | 7549 | 464        | 7559 | 458        | 7561 | 464        | 7573 | 467        |
| 7577 | 465        | 7583 | 467        | 7589 | 459        | 7591 | 469        | 7603 | 465        | 7607 | 462        |
| 7621 | 465        | 7639 | 465        | 7643 | 462        | 7649 | 470        | 7669 | 469        | 7673 | 470        |
| 7681 | 467        | 7687 | 469        | 7691 | 469        | 7699 | 471        | 7703 | 471        | 7717 | 468        |
| 7723 | 471        | 7727 | 469        | 7741 | 467        | 7753 | 475        | 7757 | 467        | 7759 | 468        |
| 7789 | 473        | 7793 | 470        | 7817 | 471        | 7823 | 474        | 7829 | 472        | 7841 | 473        |
| 7853 | 471        | 7867 | 475        | 7873 | 479        | 7877 | 474        | 7879 | 475        | 7883 | 473        |
| 7901 | 476        | 7907 | 475        | 7919 | 479        | 7927 | 478        | 7933 | 478        | 7937 | 478        |
| 7949 | 473        | 7951 | 474        | 7963 | 476        | 7993 | 484        | 8009 | 476        | 8011 | 474        |
| 8017 | 481        | 8039 | 482        | 8053 | 480        | 8059 | 482        | 8069 | 486        | 8081 | 481        |
| 8087 | 482        | 8089 | 481        | 8093 | 484        | 8101 | 483        | 8111 | 484        | 8117 | 488        |
| 8123 | 484        | 8147 | 482        | 8161 | 483        | 8167 | 483        | 8171 | 487        | 8179 | 486        |
| 8191 | 487        | 8209 | 489        | 8219 | 488        | 8221 | 485        | 8231 | 484        | 8233 | 490        |
| 8237 | 487        | 8243 | 487        | 8263 | 488        | 8269 | 491        | 8273 | 486        | 8287 | 493        |
| 8291 | 492        | 8293 | 491        | 8297 | 483        | 8311 | 492        | 8317 | 489        | 8329 | 492        |
| 8353 | 495        | 8363 | 495        | 8369 | 490        | 8377 | 493        | 8387 | 491        | 8389 | 491        |
| $q$  | $t_2^R$ | $q$  | $t_2^R$ | $q$  | $t_2^R$ | $q$  | $t_2^R$ | $q$  | $t_2^R$ |
|------|---------|------|---------|------|---------|------|---------|------|---------|
| 8419 | 496     | 8423 | 495     | 8429 | 496     | 8431 | 495     | 8443 | 494     |
| 8461 | 497     | 8467 | 497     | 8501 | 495     | 8513 | 497     | 8521 | 495     |
| 8537 | 493     | 8539 | 497     | 8543 | 498     | 8563 | 495     | 8573 | 497     |
| 8597 | 500     | 8599 | 497     | 8609 | 502     | 8623 | 496     | 8627 | 499     |
| 8641 | 505     | 8647 | 504     | 8663 | 507     | 8669 | 503     | 8677 | 500     |
| 8689 | 503     | 8693 | 507     | 8699 | 506     | 8707 | 504     | 8713 | 507     |
| 8731 | 506     | 8737 | 502     | 8741 | 506     | 8747 | 504     | 8753 | 508     |
| 8779 | 503     | 8783 | 504     | 8803 | 509     | 8807 | 502     | 8819 | 501     |
| 8831 | 511     | 8837 | 507     | 8839 | 506     | 8849 | 501     | 8861 | 505     |
| 8867 | 506     | 8887 | 507     | 8903 | 511     | 8923 | 513     | 8929 | 510     |
| 8941 | 507     | 8951 | 509     | 8963 | 511     | 8969 | 506     | 8971 | 510     |
| 9001 | 511     | 9007 | 517     | 9011 | 514     | 9013 | 519     | 9029 | 511     |
| 9043 | 520     | 9049 | 514     | 9059 | 512     | 9067 | 515     | 9091 | 514     |
| 9109 | 513     | 9127 | 517     | 9133 | 514     | 9137 | 515     | 9151 | 513     |
| 9161 | 511     | 9173 | 517     | 9181 | 521     | 9187 | 517     | 9199 | 517     |
| 9209 | 520     | 9221 | 520     | 9227 | 519     | 9239 | 523     | 9241 | 514     |
| 9277 | 522     | 9281 | 523     | 9283 | 523     | 9293 | 520     | 9311 | 523     |
| 9323 | 521     | 9337 | 525     | 9341 | 518     | 9343 | 523     | 9349 | 523     |
| 9377 | 524     | 9391 | 527     | 9397 | 522     | 9403 | 529     | 9413 | 527     |
| 9421 | 522     | 9431 | 526     | 9433 | 525     | 9437 | 529     | 9439 | 527     |
| 9463 | 527     | 9467 | 524     | 9473 | 531     | 9479 | 523     | 9491 | 521     |
| 9511 | 525     | 9521 | 530     | 9533 | 532     | 9539 | 529     | 9547 | 526     |
| 9587 | 532     | 9601 | 535     | 9613 | 530     | 9619 | 531     | 9623 | 533     |
| 9631 | 529     | 9643 | 530     | 9649 | 541     | 9661 | 534     | 9677 | 531     |
| 9689 | 534     | 9697 | 530     | 9719 | 539     | 9721 | 536     | 9733 | 536     |
| 9743 | 537     | 9749 | 539     | 9767 | 542     | 9769 | 531     | 9781 | 533     |
| 9791 | 537     | 9803 | 536     | 9811 | 539     | 9817 | 541     | 9829 | 540     |
| 9839 | 536     | 9851 | 541     | 9857 | 537     | 9859 | 539     | 9871 | 538     |
| 9887 | 536     | 9901 | 535     | 9907 | 545     | 9923 | 540     | 9929 | 539     |
| 9941 | 547     | 9949 | 541     | 9967 | 544     | 9973 | 539     | 9973 | 545     |
| 10009| 542     | 10037| 547     | 10039| 545     | 10061| 545     | 10067| 547     |
| 10079| 545     | 10091| 549     | 10093| 545     | 10099| 548     | 10103| 550     |
| 10133| 547     | 10139| 548     | 10141| 551     | 10151| 548     | 10159| 547     |
| 10169| 546     | 10177| 551     | 10181| 553     | 10193| 546     | 10211| 551     |
| 10243| 554     | 10247| 548     | 10253| 552     | 10259| 555     | 10267| 547     |
| q  | $t^R_2$ | q  | $t^R_2$ | q  | $t^R_2$ | q  | $t^R_2$ | q  | $t^R_2$ |
|----|---------|----|---------|----|---------|----|---------|----|---------|
| 10273 | 549 | 10289 | 549 | 10301 | 555 | 10313 | 550 | 10321 | 553 |
| 10331 | 555 | 10333 | 554 | 10337 | 554 | 10343 | 555 | 10357 | 556 |
| 10369 | 556 | 10399 | 553 | 10427 | 555 | 10429 | 554 | 10433 | 552 |
| 10453 | 564 | 10457 | 555 | 10463 | 556 | 10477 | 558 | 10487 | 560 |
| 10499 | 557 | 10501 | 559 | 10529 | 559 | 10531 | 562 | 10559 | 561 |
| 10567 | 564 | 10589 | 563 | 10601 | 564 | 10607 | 564 | 10613 | 563 |
| 10627 | 564 | 10631 | 557 | 10651 | 560 | 10657 | 565 | 10663 | 567 |
| 10667 | 561 | 10687 | 566 | 10709 | 562 | 10711 | 564 | 10723 | 568 |
| 10729 | 566 | 10733 | 569 | 10753 | 572 | 10771 | 563 | 10781 | 565 |
| 10789 | 568 | 10799 | 568 | 10837 | 566 | 10847 | 572 | 10853 | 567 |
| 10859 | 569 | 10861 | 576 | 10883 | 570 | 10889 | 569 | 10891 | 572 |
| 10903 | 574 | 10909 | 572 | 10939 | 573 | 10949 | 567 | 10957 | 572 |
| 10973 | 575 | 10979 | 575 | 10993 | 575 | 11003 | 576 | 11027 | 576 |
| 11047 | 570 | 11057 | 567 | 11059 | 573 | 11069 | 572 | 11071 | 574 |
| 11083 | 577 | 11087 | 585 | 11103 | 577 | 11131 | 582 | 11149 | 582 |
| 11197 | 579 | 11213 | 583 | 11239 | 580 | 11243 | 581 | 11251 | 577 |
| 11257 | 586 | 11261 | 579 | 11279 | 584 | 11287 | 585 | 11299 | 575 |
| 11311 | 584 | 11317 | 575 | 11319 | 573 | 11321 | 584 | 11351 | 584 |
| 11353 | 587 | 11369 | 585 | 11383 | 580 | 11443 | 586 | 11447 | 587 |
| 11471 | 583 | 11483 | 586 | 11489 | 584 | 11491 | 585 | 11497 | 586 |
| 11503 | 587 | 11519 | 590 | 11527 | 588 | 11549 | 588 | 11551 | 590 |
| 11579 | 592 | 11587 | 592 | 11593 | 592 | 11597 | 597 | 11617 | 583 |
| 11621 | 591 | 11633 | 596 | 11657 | 590 | 11677 | 595 | 11681 | 592 |
| 11689 | 596 | 11699 | 597 | 11701 | 597 | 11717 | 592 | 11719 | 594 |
| 11731 | 596 | 11743 | 594 | 11777 | 593 | 11779 | 596 | 11789 | 597 |
| 11801 | 600 | 11807 | 598 | 11813 | 595 | 11821 | 593 | 11827 | 599 |
| 11831 | 603 | 11833 | 596 | 11839 | 595 | 11863 | 597 | 11867 | 596 |
| 11887 | 604 | 11897 | 600 | 11903 | 599 | 11909 | 600 | 11923 | 600 |
| 11927 | 602 | 11933 | 601 | 11939 | 599 | 11941 | 607 | 11953 | 602 |
| 11959 | 602 | 11969 | 600 | 11971 | 601 | 11981 | 597 | 11987 | 602 |
| 12007 | 599 | 12011 | 607 | 12037 | 599 | 12041 | 601 | 12043 | 603 |
| 12049 | 603 | 12071 | 606 | 12097 | 605 | 12101 | 605 | 12107 | 607 |
| 12109 | 604 | 12113 | 605 | 12143 | 605 | 12149 | 607 | 12157 | 608 |
| 12161 | 602 | 12163 | 600 | 12203 | 605 | 12211 | 608 | 12227 | 611 |
| 12239 | 605 | 12241 | 607 | 12253 | 609 | 12263 | 609 | 12269 | 607 |
| 12277 | 608 | 12281 | 606 | 12289 | 611 |
| q  | $t_R^2$ | q  | $t_R^2$ | q  | $t_R^2$ | q  | $t_R^2$ | q  | $t_R^2$ |
|----|--------|----|--------|----|--------|----|--------|----|--------|
| 12301 | 613 | 12323 | 608 | 12329 | 607 | 12343 | 616 | 12347 | 609 | 12373 | 619 |
| 12377 | 613 | 12379 | 611 | 12391 | 617 | 12401 | 612 | 12409 | 610 | 12413 | 613 |
| 12421 | 612 | 12433 | 610 | 12437 | 613 | 12451 | 616 | 12457 | 608 | 12473 | 618 |
| 12479 | 612 | 12487 | 617 | 12491 | 614 | 12497 | 620 | 12503 | 617 | 12511 | 618 |
| 12517 | 614 | 12527 | 616 | 12539 | 622 | 12541 | 620 | 12547 | 617 | 12553 | 617 |
| 12569 | 624 | 12577 | 612 | 12589 | 618 | 12601 | 622 | 12609 | 618 | 12611 | 619 |
| 12613 | 621 | 12619 | 619 | 12637 | 622 | 12641 | 622 | 12647 | 628 | 12653 | 618 |
| 12659 | 617 | 12671 | 623 | 12689 | 627 | 12697 | 623 | 12703 | 618 | 12713 | 620 |
| 12721 | 616 | 12739 | 620 | 12743 | 623 | 12757 | 629 | 12763 | 622 | 12781 | 625 |
| 12791 | 625 | 12799 | 625 | 12809 | 625 | 12821 | 625 | 12823 | 618 | 12829 | 623 |
| 12841 | 619 | 12853 | 623 | 12889 | 624 | 12893 | 626 | 12899 | 627 | 12907 | 624 |
| 12911 | 625 | 12917 | 630 | 12919 | 628 | 12923 | 626 | 12941 | 622 | 12953 | 622 |
| 12959 | 633 | 12967 | 628 | 12973 | 628 | 12979 | 630 | 12983 | 630 | 13001 | 626 |
| 13003 | 633 | 13007 | 632 | 13009 | 631 | 13033 | 635 | 13037 | 633 | 13043 | 630 |
| 13049 | 634 | 13063 | 632 | 13093 | 628 | 13099 | 627 | 13103 | 627 | 13109 | 634 |
| 13121 | 629 | 13127 | 636 | 13147 | 632 | 13151 | 635 | 13159 | 628 | 13163 | 639 |
| 13171 | 636 | 13177 | 633 | 13183 | 632 | 13187 | 629 | 13217 | 638 | 13219 | 637 |
| 13229 | 639 | 13241 | 633 | 13249 | 635 | 13259 | 633 | 13267 | 636 | 13291 | 635 |
| 13297 | 635 | 13309 | 638 | 13313 | 637 | 13327 | 637 | 13331 | 643 | 13337 | 643 |
| 13339 | 638 | 13367 | 638 | 13381 | 639 | 13397 | 641 | 13399 | 642 | 13411 | 639 |
| 13417 | 636 | 13421 | 642 | 13441 | 636 | 13451 | 642 | 13457 | 642 | 13463 | 637 |
| 13469 | 641 | 13477 | 646 | 13487 | 643 | 13499 | 636 | 13513 | 647 | 13523 | 641 |
| 13537 | 645 | 13553 | 645 | 13567 | 651 | 13577 | 646 | 13591 | 646 | 13597 | 650 |
| 13613 | 648 | 13619 | 645 | 13627 | 649 | 13633 | 648 | 13649 | 648 | 13669 | 644 |
| 13679 | 641 | 13681 | 648 | 13687 | 650 | 13691 | 646 | 13693 | 648 | 13697 | 650 |
| 13709 | 648 | 13711 | 653 | 13721 | 639 | 13723 | 651 | 13729 | 645 | 13751 | 646 |
| 13757 | 648 | 13759 | 652 | 13763 | 652 | 13781 | 652 | 13789 | 650 | 13799 | 654 |
| 13807 | 645 | 13829 | 648 | 13831 | 647 | 13841 | 650 | 13859 | 651 | 13873 | 654 |
| 13877 | 647 | 13879 | 655 | 13883 | 653 | 13901 | 650 | 13903 | 655 | 13907 | 651 |
| 13913 | 655 | 13921 | 647 | 13931 | 651 | 13933 | 654 | 13963 | 653 | 13967 | 651 |
| 13997 | 653 | 13999 | 657 | 14009 | 656 | 14011 | 652 | 14029 | 654 | 14033 | 659 |
| 14051 | 658 | 14057 | 656 | 14071 | 664 | 14081 | 659 | 14083 | 665 | 14087 | 658 |
| 14107 | 661 | 14143 | 661 | 14149 | 664 | 14153 | 658 | 14159 | 659 | 14173 | 658 |
| 14177 | 662 | 14197 | 662 | 14207 | 666 | 14221 | 663 | 14243 | 661 | 14249 | 661 |
| 14251 | 661 | 14281 | 661 | 14293 | 663 | 14303 | 666 | 14321 | 662 | 14323 | 663 |
Table 1 Continue 8

| q   | \( t^R_2 \) | q   | \( t^R_2 \) | q   | \( t^R_2 \) | q   | \( t^R_2 \) | q   | \( t^R_2 \) |
|-----|-------------|-----|-------------|-----|-------------|-----|-------------|-----|-------------|
| 14327 | 660 | 14341 | 666 | 14347 | 667 | 14369 | 663 | 14387 | 664 |
| 14401 | 664 | 14411 | 665 | 14419 | 668 | 14423 | 670 | 14431 | 665 |
| 14437 | 668 | 14441 | 666 | 14461 | 671 | 14479 | 667 | 14489 | 672 |
| 14503 | 667 | 14519 | 676 | 14537 | 668 | 14543 | 666 | 14549 | 668 |
| 14551 | 665 | 14557 | 667 | 14561 | 668 | 14563 | 668 | 14591 | 674 |
| 14621 | 672 | 14627 | 671 | 14633 | 671 | 14639 | 672 | 14653 | 674 |
| 14657 | 676 | 14669 | 676 | 14683 | 666 | 14699 | 671 | 14713 | 672 |
| 14723 | 676 | 14731 | 678 | 14741 | 677 | 14747 | 678 | 14753 | 675 |
| 14759 | 674 | 14767 | 675 | 14779 | 674 | 14783 | 676 | 14797 | 674 |
| 14813 | 673 | 14821 | 678 | 14831 | 678 | 14843 | 671 | 14851 | 677 |
| 14867 | 683 | 14869 | 685 | 14879 | 679 | 14887 | 676 | 14891 | 675 |
| 14923 | 677 | 14929 | 681 | 14939 | 679 | 14947 | 685 | 14951 | 681 |
| 14969 | 682 | 14983 | 683 | 15013 | 683 | 15017 | 684 | 15031 | 683 |
| 15053 | 684 | 15061 | 686 | 15073 | 686 | 15077 | 683 | 15083 | 682 |
| 15101 | 687 | 15107 | 685 | 15121 | 685 | 15131 | 689 | 15137 | 687 |
| 15149 | 687 | 15161 | 689 | 15173 | 688 | 15187 | 687 | 15193 | 684 |
| 15217 | 680 | 15227 | 688 | 15233 | 689 | 15241 | 683 | 15259 | 685 |
| 15269 | 684 | 15271 | 693 | 15277 | 685 | 15287 | 688 | 15289 | 686 |
| 15307 | 687 | 15313 | 689 | 15319 | 692 | 15329 | 689 | 15331 | 686 |
| 15359 | 685 | 15361 | 692 | 15373 | 687 | 15377 | 692 | 15383 | 691 |
| 15401 | 688 | 15413 | 691 | 15427 | 690 | 15439 | 690 | 15443 | 694 |
| 15461 | 689 | 15467 | 698 | 15473 | 686 | 15493 | 692 | 15497 | 687 |
| 15527 | 696 | 15541 | 693 | 15551 | 696 | 15559 | 690 | 15569 | 698 |
| 15583 | 694 | 15601 | 702 | 15607 | 694 | 15619 | 696 | 15629 | 700 |
| 15643 | 696 | 15647 | 697 | 15649 | 694 | 15661 | 703 | 15667 | 692 |
| 15679 | 705 | 15683 | 698 | 15727 | 703 | 15731 | 699 | 15733 | 697 |
| 15739 | 698 | 15749 | 699 | 15761 | 699 | 15767 | 695 | 15773 | 697 |
| 15791 | 695 | 15797 | 702 | 15803 | 703 | 15809 | 703 | 15817 | 696 |
| 15859 | 698 | 15877 | 704 | 15881 | 705 | 15887 | 703 | 15889 | 707 |
| 15907 | 706 | 15913 | 700 | 15919 | 702 | 15923 | 705 | 15937 | 711 |
| 15971 | 704 | 15973 | 706 | 15991 | 706 | 16001 | 709 | 16007 | 708 |
| 16057 | 708 | 16061 | 710 | 16063 | 708 | 16067 | 711 | 16069 | 708 |
| 16087 | 714 | 16091 | 706 | 16097 | 706 | 16103 | 712 | 16111 | 709 |
| 16139 | 713 | 16141 | 716 | 16183 | 707 | 16187 | 715 | 16189 | 713 |
| 16217 | 716 | 16223 | 713 | 16229 | 711 | 16231 | 713 | 16249 | 714 |
| 16253 | 715 |
| $q$   | $t_{q_1}^R$ | $q$   | $t_{q_2}^R$ | $q$   | $t_{q_3}^R$ | $q$   | $t_{q_4}^R$ | $q$   | $t_{q_5}^R$ |
|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|
| 16267 | 715         | 16273 | 708         | 16301 | 710         | 16319 | 719         | 16333 | 709         |
| 16349 | 714         | 16361 | 718         | 16363 | 719         | 16369 | 715         | 16381 | 712         |
| 16417 | 719         | 16421 | 717         | 16427 | 727         | 16433 | 717         | 16447 | 716         |
| 16453 | 717         | 16477 | 714         | 16481 | 722         | 16487 | 721         | 16493 | 714         |
| 16529 | 719         | 16547 | 719         | 16553 | 722         | 16561 | 723         | 16567 | 717         |
| 16603 | 717         | 16607 | 720         | 16619 | 718         | 16631 | 716         | 16633 | 719         |
| 16651 | 722         | 16657 | 720         | 16661 | 724         | 16673 | 725         | 16691 | 719         |
| 16699 | 720         | 16703 | 730         | 16729 | 722         | 16741 | 722         | 16747 | 723         |
| 16763 | 731         | 16787 | 724         | 16811 | 724         | 16823 | 722         | 16829 | 723         |
| 16843 | 729         | 16871 | 721         | 16879 | 726         | 16883 | 730         | 16889 | 733         |
| 16903 | 733         | 16921 | 729         | 16927 | 727         | 16931 | 726         | 16937 | 724         |
| 16963 | 735         | 16979 | 733         | 16981 | 729         | 16987 | 727         | 16993 | 728         |
| 17021 | 727         | 17027 | 732         | 17029 | 735         | 17033 | 727         | 17041 | 734         |
| 17053 | 734         | 17077 | 730         | 17093 | 737         | 17099 | 733         | 17107 | 731         |
| 17123 | 735         | 17137 | 732         | 17159 | 729         | 17167 | 736         | 17183 | 737         |
| 17191 | 740         | 17203 | 737         | 17207 | 732         | 17209 | 733         | 17231 | 732         |
| 17257 | 738         | 17291 | 733         | 17293 | 744         | 17299 | 734         | 17317 | 734         |
| 17327 | 739         | 17333 | 737         | 17341 | 740         | 17351 | 737         | 17359 | 740         |
| 17383 | 738         | 17387 | 740         | 17389 | 739         | 17393 | 734         | 17401 | 742         |
| 17419 | 744         | 17431 | 743         | 17443 | 741         | 17449 | 739         | 17467 | 743         |
| 17477 | 737         | 17483 | 745         | 17489 | 746         | 17491 | 740         | 17497 | 742         |
| 17519 | 743         | 17539 | 744         | 17551 | 741         | 17569 | 740         | 17573 | 740         |
| 17581 | 745         | 17597 | 745         | 17599 | 744         | 17609 | 744         | 17623 | 741         |
| 17657 | 750         | 17659 | 747         | 17669 | 748         | 17681 | 747         | 17683 | 745         |
| 17713 | 747         | 17729 | 751         | 17737 | 745         | 17747 | 749         | 17749 | 751         |
| 17783 | 749         | 17789 | 744         | 17791 | 749         | 17807 | 755         | 17827 | 747         |
| 17839 | 756         | 17851 | 750         | 17863 | 749         | 17881 | 753         | 17891 | 752         |
| 17909 | 751         | 17911 | 749         | 17921 | 752         | 17923 | 745         | 17929 | 755         |
| 17957 | 754         | 17959 | 754         | 17971 | 753         | 17977 | 755         | 17981 | 747         |
| 17989 | 752         | 18013 | 750         | 18041 | 750         | 18043 | 753         | 18047 | 756         |
| 18059 | 760         | 18061 | 756         | 18077 | 754         | 18089 | 754         | 18097 | 759         |
| 18121 | 758         | 18127 | 756         | 18131 | 759         | 18133 | 758         | 18143 | 754         |
| 18169 | 758         | 18181 | 758         | 18191 | 762         | 18199 | 750         | 18211 | 754         |
| 18233 | 763         | 18229 | 760         | 18233 | 758         | 18251 | 763         | 18253 | 762         |
| 18269 | 759         | 18287 | 760         | 18289 | 763         | 18301 | 758         | 18307 | 762         |
| $q$  | $t_R^2$ | $q$  | $t_R^2$ | $q$  | $t_R^2$ | $q$  | $t_R^2$ | $q$  | $t_R^2$ |
|------|---------|------|---------|------|---------|------|---------|------|---------|
| 18313 | 761     | 18329 | 762     | 18341 | 758     | 18353 | 768     | 18367 | 765     |
| 18379 | 763     | 18401 | 760     | 18413 | 759     | 18427 | 764     | 18433 | 764     |
| 18439 | 772     | 18451 | 768     | 18457 | 765     | 18461 | 772     | 18481 | 762     |
| 18493 | 770     | 18517 | 767     | 18521 | 767     | 18523 | 768     | 18539 | 768     |
| 18541 | 770     | 18553 | 767     | 18583 | 768     | 18587 | 767     | 18593 | 769     |
| 18637 | 774     | 18661 | 772     | 18671 | 766     | 18679 | 772     | 18691 | 778     |
| 18713 | 774     | 18719 | 770     | 18731 | 769     | 18743 | 772     | 18749 | 766     |
| 18773 | 763     | 18787 | 767     | 18793 | 775     | 18797 | 780     | 18803 | 773     |
| 18859 | 778     | 18869 | 774     | 18909 | 777     | 18911 | 772     | 18913 | 778     |
| 18919 | 773     | 18947 | 778     | 18959 | 777     | 18973 | 773     | 18979 | 780     |
| 19009 | 774     | 19013 | 773     | 19031 | 778     | 19037 | 778     | 19051 | 779     |
| 19073 | 783     | 19079 | 779     | 19081 | 779     | 19087 | 778     | 19121 | 774     |
| 19141 | 783     | 19157 | 778     | 19163 | 783     | 19181 | 778     | 19183 | 783     |
| 19211 | 784     | 19213 | 783     | 19219 | 784     | 19231 | 780     | 19237 | 787     |
| 19259 | 784     | 19267 | 786     | 19273 | 787     | 19289 | 780     | 19301 | 785     |
| 19319 | 787     | 19333 | 791     | 19373 | 784     | 19379 | 781     | 19381 | 783     |
| 19391 | 790     | 19403 | 785     | 19417 | 783     | 19421 | 792     | 19423 | 781     |
| 19429 | 786     | 19433 | 786     | 19441 | 787     | 19447 | 784     | 19457 | 794     |
| 19469 | 785     | 19471 | 794     | 19477 | 790     | 19483 | 795     | 19489 | 787     |
| 19507 | 785     | 19531 | 792     | 19541 | 784     | 19543 | 789     | 19553 | 791     |
| 19571 | 792     | 19577 | 793     | 19583 | 794     | 19597 | 793     | 19603 | 794     |
| 19661 | 793     | 19681 | 795     | 19687 | 797     | 19697 | 791     | 19699 | 799     |
| 19717 | 798     | 19727 | 800     | 19739 | 795     | 19751 | 787     | 19753 | 790     |
| 19763 | 795     | 19777 | 799     | 19793 | 797     | 19801 | 792     | 19813 | 793     |
| 19841 | 795     | 19843 | 794     | 19853 | 796     | 19861 | 797     | 19867 | 800     |
| 19891 | 799     | 19913 | 791     | 19919 | 796     | 19927 | 796     | 19937 | 798     |
| 19961 | 797     | 19963 | 802     | 19973 | 799     | 19979 | 797     | 19991 | 800     |
| 19997 | 795     | 19997 | 796     | 20011 | 804     | 20021 | 800     | 20023 | 795     |
| 20047 | 797     | 20051 | 801     | 20063 | 801     | 20071 | 801     | 20089 | 796     |
| 20107 | 806     | 20113 | 798     | 20117 | 794     | 20123 | 804     | 20129 | 796     |
| 20147 | 796     | 20149 | 811     | 20161 | 804     | 20173 | 808     | 20177 | 805     |
| 20201 | 800     | 20219 | 805     | 20231 | 803     | 20233 | 800     | 20249 | 806     |
| 20269 | 810     | 20287 | 807     | 20297 | 804     | 20323 | 810     | 20327 | 809     |
| 20341 | 811     | 20347 | 805     | 20353 | 808     | 20357 | 810     | 20359 | 811     |
| 20389 | 807     | 20393 | 806     | 20399 | 810     | 20407 | 808     | 20411 | 810     |

20
| $q$ | $t^R_2$ | $q$ | $t^R_2$ | $q$ | $t^R_2$ | $q$ | $t^R_2$ | $q$ | $t^R_2$ |
|-----|---------|-----|---------|-----|---------|-----|---------|-----|---------|
| 20441 | 808 | 20477 | 808 | 20479 | 815 | 20483 | 807 | 20507 | 807 |
| 20509 | 813 | 20533 | 815 | 20543 | 815 | 20549 | 812 | 20551 | 814 |
| 20563 | 813 | 20593 | 813 | 20611 | 816 | 20627 | 814 | 20639 | 812 |
| 20641 | 819 | 20681 | 819 | 20693 | 811 | 20707 | 812 | 20717 | 814 |
| 20719 | 812 | 20743 | 819 | 20747 | 817 | 20749 | 811 | 20753 | 815 |
| 20759 | 815 | 20771 | 818 | 20789 | 816 | 20807 | 817 | 20809 | 812 |
| 20849 | 817 | 20857 | 821 | 20879 | 820 | 20887 | 819 | 20897 | 824 |
| 20899 | 818 | 20921 | 815 | 20929 | 822 | 20939 | 819 | 20947 | 824 |
| 20959 | 822 | 20963 | 827 | 20983 | 823 | 21001 | 822 | 21011 | 820 |
| 21013 | 816 | 21019 | 823 | 21023 | 817 | 21031 | 825 | 21059 | 826 |
| 21061 | 824 | 21067 | 825 | 21101 | 823 | 21107 | 818 | 21121 | 823 |
| 21139 | 832 | 21143 | 819 | 21149 | 822 | 21157 | 820 | 21163 | 824 |
| 21179 | 819 | 21187 | 823 | 21193 | 826 | 21211 | 828 | 21221 | 830 |
| 21227 | 828 | 21247 | 831 | 21269 | 830 | 21283 | 828 | 21313 | 827 |
| 21317 | 826 | 21319 | 829 | 21341 | 828 | 21347 | 833 | 21377 | 834 |
| 21379 | 833 | 21383 | 825 | 21391 | 830 | 21397 | 823 | 21401 | 827 |
| 21419 | 833 | 21433 | 831 | 21467 | 825 | 21481 | 829 | 21487 | 836 |
| 21493 | 834 | 21499 | 830 | 21503 | 830 | 21517 | 823 | 21521 | 829 |
| 21529 | 831 | 21557 | 829 | 21559 | 832 | 21563 | 832 | 21569 | 833 |
| 21578 | 836 | 21589 | 836 | 21599 | 837 | 21601 | 831 | 21611 | 838 |
| 21617 | 837 | 21647 | 845 | 21649 | 835 | 21661 | 836 | 21673 | 834 |
| 21701 | 835 | 21713 | 844 | 21727 | 834 | 21737 | 831 | 21739 | 837 |
| 21757 | 836 | 21767 | 835 | 21773 | 835 | 21787 | 843 | 21799 | 840 |
| 21817 | 838 | 21821 | 836 | 21839 | 848 | 21841 | 847 | 21851 | 839 |
| 21863 | 845 | 21871 | 841 | 21881 | 838 | 21893 | 839 | 21911 | 838 |
| 21937 | 842 | 21943 | 841 | 21961 | 837 | 21977 | 843 | 21991 | 850 |
| 22003 | 846 | 22013 | 844 | 22027 | 846 | 22031 | 845 | 22037 | 845 |
| 22051 | 841 | 22063 | 842 | 22073 | 841 | 22079 | 846 | 22091 | 843 |
| 22093 | 846 | 22109 | 841 | 22111 | 851 | 22123 | 847 | 22129 | 842 |
| 22147 | 846 | 22153 | 845 | 22157 | 846 | 22159 | 849 | 22171 | 850 |
| 22193 | 844 | 22229 | 854 | 22247 | 848 | 22259 | 849 | 22271 | 847 |
| 22277 | 852 | 22279 | 854 | 22283 | 845 | 22291 | 847 | 22303 | 852 |
| 22343 | 848 | 22349 | 853 | 22367 | 849 | 22369 | 848 | 22381 | 851 |
| 22397 | 854 | 22409 | 846 | 22433 | 859 | 22441 | 849 | 22447 | 855 |
| 22469 | 852 | 22481 | 857 | 22483 | 846 | 22501 | 854 | 22511 | 852 |

Table 1 Continue 11
| q   | $t^R_2$ | q   | $t^R_2$ | q   | $t^R_2$ | q   | $t^R_2$ | q   | $t^R_2$ |
|-----|--------|-----|--------|-----|--------|-----|--------|-----|--------|
| 22541 853 | 22543 856 | 22549 857 | 22567 858 | 22571 859 | 22573 856 |
| 22613 853 | 22619 854 | 22621 857 | 22637 858 | 22639 857 | 22643 853 |
| 22651 855 | 22659 863 | 22671 857 | 22672 856 | 22739 858 | 22741 864 |
| 22751 856 | 22769 853 | 22777 863 | 22783 853 | 22797 856 | 22807 857 |
| 22811 868 | 22817 861 | 22853 858 | 22859 856 | 22861 859 | 22871 866 |
| 22977 866 | 22901 857 | 22907 863 | 22921 867 | 22937 859 | 22943 866 |
| 22961 855 | 22963 862 | 22973 866 | 22993 862 | 23003 861 | 23011 859 |
| 23017 864 | 23021 862 | 23027 865 | 23029 862 | 23039 866 | 23041 867 |
| 23053 865 | 23057 870 | 23059 864 | 23063 862 | 23071 868 | 23081 871 |
| 23087 870 | 23099 863 | 23117 864 | 23131 860 | 23143 868 | 23159 876 |
| 23167 872 | 23173 867 | 23189 864 | 23197 875 | 23201 867 | 23203 870 |
| 23209 862 | 23227 863 | 23251 862 | 23269 869 | 23279 871 | 23291 868 |
| 23293 865 | 23297 873 | 23311 866 | 23321 871 | 23327 867 | 23333 872 |
| 23339 872 | 23357 872 | 23369 874 | 23371 868 | 23399 876 | 23417 872 |
| 23431 875 | 23447 880 | 23459 875 | 23473 877 | 23497 875 | 23509 875 |
| 23531 874 | 23537 877 | 23539 880 | 23549 876 | 23557 877 | 23561 881 |
| 23563 871 | 23567 877 | 23581 871 | 23593 879 | 23599 884 | 23603 878 |
| 23609 878 | 23623 882 | 23627 875 | 23629 877 | 23633 875 | 23663 878 |
| 23669 878 | 23671 879 | 23677 878 | 23687 876 | 23689 882 | 23719 883 |
| 23741 875 | 23743 883 | 23747 881 | 23753 874 | 23761 879 | 23767 883 |
| 23773 885 | 23789 885 | 23801 882 | 23813 881 | 23819 881 | 23827 879 |
| 23831 879 | 23833 882 | 23857 885 | 23869 877 | 23873 882 | 23879 879 |
| 23887 884 | 23893 888 | 23899 886 | 23909 880 | 23911 884 | 23917 882 |
| 23929 881 | 23957 887 | 23971 889 | 23977 884 | 23981 883 | 23993 879 |
| 24001 885 | 24007 881 | 24019 887 | 24023 884 | 24029 885 | 24043 891 |
| 24049 890 | 24061 881 | 24071 889 | 24077 883 | 24083 886 | 24091 881 |
| 24097 884 | 24103 883 | 24107 886 | 24109 881 | 24113 889 | 24121 884 |
| 24133 886 | 24137 892 | 24151 891 | 24169 888 | 24179 886 | 24181 891 |
| 24197 889 | 24203 891 | 24223 891 | 24229 888 | 24239 895 | 24247 889 |
| 24251 895 | 24281 896 | 24317 892 | 24329 890 | 24337 891 | 24359 887 |
| 24371 892 | 24373 898 | 24379 893 | 24391 890 | 24407 896 | 24413 896 |
| 24419 896 | 24421 899 | 24439 895 | 24443 896 | 24469 891 | 24473 895 |
| 24481 896 | 24499 895 | 24509 899 | 24517 899 | 24527 897 | 24533 895 |
| 24547 901 | 24551 898 | 24571 901 | 24593 891 | 24611 902 | 24623 900 |
| \( q \) | \( t_2^R \) | \( q \) | \( t_2^R \) | \( q \) | \( t_2^R \) | \( q \) | \( t_2^R \) | \( q \) | \( t_2^R \) |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 24631 | 888   | 24659 | 901   | 24671 | 896   | 24677 | 899   | 24683 | 898   |
| 24697 | 899   | 24709 | 903   | 24733 | 899   | 24749 | 895   | 24763 | 894   |
| 24781 | 900   | 24793 | 906   | 24799 | 896   | 24809 | 901   | 24821 | 904   |
| 24847 | 908   | 24851 | 901   | 24859 | 907   | 24877 | 906   | 24889 | 910   |
| 24917 | 902   | 24919 | 905   | 24923 | 902   | 24943 | 905   | 24953 | 903   |
| 24971 | 903   | 24977 | 905   | 24979 | 905   | 24989 | 901   | 24989 | 911   |
| 25031 | 909   | 25033 | 900   | 25037 | 908   | 25057 | 901   | 25073 | 905   |
| 25097 | 908   | 25111 | 904   | 25117 | 899   | 25121 | 909   | 25127 | 908   |
| 25153 | 905   | 25163 | 918   | 25169 | 906   | 25171 | 918   | 25183 | 906   |
| 25219 | 912   | 25229 | 910   | 25237 | 908   | 25243 | 917   | 25247 | 923   |
| 25261 | 913   | 25301 | 911   | 25303 | 905   | 25307 | 916   | 25309 | 915   |
| 25339 | 909   | 25343 | 915   | 25349 | 905   | 25357 | 917   | 25367 | 914   |
| 25391 | 915   | 25409 | 905   | 25411 | 914   | 25423 | 909   | 25439 | 912   |
| 25453 | 913   | 25457 | 922   | 25463 | 901   | 25469 | 914   | 25471 | 909   |
| 25537 | 913   | 25541 | 915   | 25561 | 917   | 25577 | 912   | 25579 | 920   |
| 25589 | 918   | 25601 | 917   | 25603 | 915   | 25609 | 918   | 25621 | 919   |
| 25639 | 913   | 25643 | 923   | 25657 | 915   | 25667 | 919   | 25673 | 918   |
| 25693 | 913   | 25703 | 917   | 25717 | 914   | 25733 | 913   | 25741 | 913   |
| 25759 | 925   | 25763 | 921   | 25771 | 919   | 25793 | 921   | 25799 | 920   |
| 25819 | 914   | 25841 | 919   | 25847 | 920   | 25849 | 918   | 25867 | 918   |
| 25889 | 920   | 25903 | 919   | 25913 | 927   | 25919 | 924   | 25931 | 920   |
| 25939 | 921   | 25943 | 929   | 25951 | 927   | 25969 | 929   | 25981 | 921   |
| 25999 | 917   | 26003 | 928   | 26017 | 923   | 26021 | 927   | 26029 | 927   |
| 26053 | 921   | 26083 | 926   | 26099 | 924   | 26107 | 932   | 26111 | 927   |
| 26119 | 932   | 26141 | 923   | 26153 | 930   | 26161 | 929   | 26171 | 929   |
| 26183 | 930   | 26189 | 929   | 26203 | 929   | 26209 | 932   | 26227 | 926   |
| 26249 | 935   | 26251 | 929   | 26261 | 930   | 26263 | 938   | 26267 | 927   |
| 26297 | 930   | 26309 | 930   | 26317 | 930   | 26321 | 930   | 26339 | 929   |
| 26357 | 934   | 26371 | 924   | 26387 | 929   | 26393 | 932   | 26399 | 928   |
| 26417 | 934   | 26423 | 935   | 26431 | 929   | 26437 | 929   | 26449 | 936   |
| 26479 | 937   | 26489 | 933   | 26497 | 939   | 26501 | 932   | 26513 | 934   |
| 26557 | 933   | 26561 | 941   | 26573 | 936   | 26591 | 935   | 26597 | 939   |
| 26633 | 936   | 26641 | 939   | 26647 | 936   | 26669 | 938   | 26681 | 939   |
| 26687 | 940   | 26693 | 936   | 26699 | 937   | 26701 | 944   | 26711 | 938   |
| 26717 | 937   | 26723 | 936   | 26729 | 936   | 26731 | 940   | 26737 | 936   |

23
## Table 1

| $q$ | $t^R_2$ | $q$ | $t^R_2$ | $q$ | $t^R_2$ | $q$ | $t^R_2$ | $q$ | $t^R_2$ |
|-----|---------|-----|---------|-----|---------|-----|---------|-----|---------|
| 26777 | 935 | 26783 | 935 | 26801 | 939 | 26813 | 939 | 26821 | 945 | 26833 | 937 |
| 26839 | 944 | 26849 | 936 | 26861 | 937 | 26863 | 943 | 26879 | 940 | 26881 | 942 |
| 26891 | 947 | 26893 | 946 | 26903 | 937 | 26921 | 941 | 26927 | 940 | 26947 | 947 |
| 26951 | 942 | 26953 | 939 | 26959 | 941 | 26981 | 940 | 26987 | 942 | 26993 | 940 |
| 27011 | 954 | 27017 | 942 | 27031 | 945 | 27043 | 951 | 27059 | 944 | 27061 | 942 |
| 27067 | 944 | 27073 | 950 | 27077 | 939 | 27091 | 944 | 27103 | 945 | 27107 | 949 |
| 27109 | 945 | 27127 | 949 | 27143 | 944 | 27179 | 946 | 27191 | 945 | 27197 | 950 |
| 27211 | 953 | 27239 | 953 | 27241 | 949 | 27253 | 954 | 27259 | 949 | 27271 | 947 |
| 27277 | 949 | 27281 | 953 | 27283 | 951 | 27299 | 953 | 27329 | 951 | 27337 | 957 |
| 27361 | 946 | 27367 | 950 | 27397 | 956 | 27407 | 949 | 27409 | 949 | 27427 | 955 |
| 27431 | 962 | 27437 | 954 | 27449 | 955 | 27457 | 947 | 27479 | 952 | 27481 | 958 |
| 27487 | 952 | 27509 | 956 | 27527 | 946 | 27529 | 955 | 27539 | 960 | 27541 | 963 |
| 27551 | 949 | 27581 | 957 | 27583 | 960 | 27611 | 957 | 27617 | 963 | 27631 | 958 |
| 27647 | 959 | 27653 | 953 | 27673 | 953 | 27689 | 955 | 27691 | 959 | 27697 | 957 |
| 27701 | 967 | 27733 | 960 | 27737 | 962 | 27739 | 953 | 27743 | 953 | 27749 | 961 |
| 27751 | 957 | 27763 | 960 | 27767 | 963 | 27773 | 963 | 27779 | 961 | 27791 | 955 |
| 27793 | 960 | 27799 | 961 | 27803 | 957 | 27809 | 953 | 27817 | 962 | 27823 | 962 |
| 27827 | 957 | 27847 | 955 | 27851 | 964 | 27883 | 961 | 27893 | 971 | 27901 | 961 |
| 27917 | 959 | 27919 | 966 | 27941 | 963 | 27943 | 959 | 27947 | 965 | 27953 | 967 |
| 27961 | 968 | 27967 | 961 | 27983 | 958 | 27997 | 963 | 28001 | 959 | 28019 | 966 |
| 28027 | 965 | 28031 | 964 | 28051 | 963 | 28057 | 967 | 28069 | 967 | 28081 | 970 |
| 28087 | 975 | 28097 | 961 | 28099 | 964 | 28109 | 967 | 28111 | 965 | 28123 | 963 |
| 28151 | 963 | 28163 | 961 | 28181 | 965 | 28183 | 967 | 28201 | 974 | 28211 | 972 |
| 28219 | 970 | 28229 | 965 | 28277 | 966 | 28279 | 968 | 28283 | 965 | 28289 | 967 |
| 28297 | 967 | 28307 | 974 | 28309 | 969 | 28319 | 968 | 28349 | 972 | 28351 | 969 |
| 28387 | 973 | 28393 | 979 | 28403 | 971 | 28409 | 968 | 28411 | 962 | 28429 | 975 |
| 28433 | 971 | 28439 | 971 | 28447 | 969 | 28463 | 969 | 28477 | 970 | 28493 | 975 |
| 28499 | 974 | 28513 | 977 | 28517 | 982 | 28537 | 967 | 28541 | 971 | 28547 | 968 |
| 28549 | 966 | 28559 | 972 | 28571 | 977 | 28573 | 969 | 28579 | 975 | 28591 | 979 |
| 28597 | 979 | 28603 | 973 | 28607 | 983 | 28619 | 974 | 28621 | 978 | 28627 | 973 |
| 28631 | 974 | 28643 | 965 | 28649 | 977 | 28657 | 976 | 28661 | 980 | 28663 | 976 |
| 28669 | 977 | 28687 | 968 | 28697 | 973 | 28703 | 978 | 28711 | 977 | 28723 | 974 |
| 28729 | 981 | 28751 | 980 | 28753 | 978 | 28759 | 979 | 28771 | 977 | 28789 | 980 |
| 28793 | 973 | 28807 | 971 | 28813 | 976 | 28817 | 988 | 28837 | 981 | 28843 | 980 |
| 28859 | 988 | 28867 | 979 | 28871 | 979 | 28879 | 972 | 28901 | 977 | 28909 | 983 |
Table 1 Continue 15

| $q$  | $t_q^R$ | $q$  | $t_q^R$ | $q$  | $t_q^R$ | $q$  | $t_q^R$ | $q$  | $t_q^R$ |
|------|---------|------|---------|------|---------|------|---------|------|---------|
| 28921| 980     | 28927| 978     | 28933| 982     | 28949| 976     | 28961| 985     |
| 28979| 982     | 28991| 992     | 29017| 985     | 29023| 980     | 29027| 978     |
| 29033| 980     | 29059| 983     | 29063| 980     | 29077| 989     | 29101| 985     |
| 29123| 986     | 29129| 985     | 29131| 984     | 29137| 988     | 29153| 987     |
| 29167| 987     | 29173| 989     | 29179| 988     | 29201| 996     | 29207| 983     |
| 29209| 992     | 29221| 986     | 29231| 985     | 29269| 985     | 29287| 986     |
| 29297| 989     | 29303| 998     | 29311| 994     | 29327| 990     | 29333| 985     |
| 29347| 989     | 29363| 993     | 29383| 993     | 29387| 986     | 29389| 988     |
| 29399| 990     | 29401| 986     | 29411| 996     | 29423| 990     | 29437| 989     |
| 29443| 991     | 29453| 991     | 29473| 986     | 29483| 994     | 29501| 991     |
| 29531| 989     | 29537| 988     | 29567| 996     | 29569| 991     | 29573| 995     |
| 29587| 993     | 29599| 999     | 29611| 990     | 29629| 992     | 29633| 993     |
| 29663| 992     | 29669| 1002    | 29671| 995     | 29683| 995     | 29717| 996     |
| 29723| 991     | 29741| 994     | 29759| 993     | 29761| 994     | 29789| 993     |
| 29803| 998     | 29819| 993     | 29837| 996     | 29867| 1005    | 29867| 1001    |
| 29873| 997     | 29879| 992     | 29881| 998     | 29917| 1001    | 29927| 1000    |
| 29947| 1001    | 29959| 1006    | 29983| 1000    | 29987| 1000    | 29989| 997     |
| 29995| 1002    | 30047| 1002    | 30059| 1002    | 30071| 1008    | 30089| 1001    |
| 30091| 1001    | 30097| 1004    | 30103| 1006    | 30133| 1006    | 30137| 1007    |
| 30149| 1007    | 30203| 1007    | 30211| 1007    | 30223| 1006    | 30241| 1006    |
| 30253| 1003    | 30259| 1012    | 30269| 1012    | 30271| 1006    | 30293| 1015    |
| 30307| 997     | 30313| 1003    | 30319| 1004    | 30323| 1006    | 30341| 1011    |
| 30347| 1000    | 30367| 1006    | 30389| 1007    | 30391| 1012    | 30403| 1004    |
| 30427| 1005    | 30431| 1014    | 30449| 1008    | 30467| 1004    | 30469| 1009    |
| 30491| 1010    | 30493| 1013    | 30497| 1010    | 30509| 1005    | 30517| 1007    |
| 30529| 1011    | 30539| 1012    | 30553| 1009    | 30557| 1008    | 30577| 1011    |
| 30593| 1015    | 30631| 1015    | 30637| 1013    | 30643| 1019    | 30649| 1014    |
| 30661| 1018    | 30671| 1011    | 30677| 1009    | 30689| 1014    | 30697| 1019    |
| 30703| 1016    | 30707| 1011    | 30713| 1014    | 30727| 1007    | 30757| 1021    |
| 30763| 1016    | 30773| 1014    | 30781| 1016    | 30803| 1017    | 30809| 1011    |
| 30817| 1013    | 30829| 1013    | 30839| 1015    | 30841| 1019    | 30851| 1015    |
| 30853| 1016    | 30859| 1021    | 30869| 1013    | 30871| 1019    | 30881| 1013    |
| 30893| 1018    | 30911| 1015    | 30931| 1008    | 30937| 1014    | 30941| 1015    |
| 30949| 1019    | 30971| 1019    | 30977| 1018    | 30983| 1018    | 31013| 1018    |
| 31019| 1017    | 31033| 1015    | 31039| 1026    | 31051| 1019    | 31063| 1023    |
| 31069| 1018    | 31079| 1024    | 31081| 1018    | 31091| 1013    | 31121| 1017    |
| 31139| 1024    | 31147| 1020    | 31151| 1028    | 31153| 1020    |
Table 1 Continue 16

| \( q \)  | \( t_R^2 \) | \( q \)  | \( t_R^2 \) | \( q \)  | \( t_R^2 \) | \( q \)  | \( t_R^2 \) | \( q \)  | \( t_R^2 \) |
|-------|----------|-------|----------|-------|----------|-------|----------|-------|----------|
| 31159 | 1021     | 31177 | 1026     | 31181 | 1020     | 31183 | 1022     | 31189 | 1017     |
| 31219 | 1025     | 31223 | 1021     | 31231 | 1018     | 31237 | 1027     | 31247 | 1024     |
| 31253 | 1023     | 31259 | 1025     | 31267 | 1026     | 31271 | 1022     | 31277 | 1018     |
| 31319 | 1020     | 31321 | 1027     | 31327 | 1030     | 31333 | 1030     | 31337 | 1024     |
| 31379 | 1032     | 31387 | 1019     | 31391 | 1031     | 31393 | 1031     | 31397 | 1030     |
| 31477 | 1023     | 31481 | 1031     | 31489 | 1028     | 31511 | 1028     | 31513 | 1029     |
| 31531 | 1024     | 31541 | 1031     | 31543 | 1028     | 31547 | 1025     | 31567 | 1024     |
| 31583 | 1035     | 31601 | 1030     | 31607 | 1026     | 31627 | 1035     | 31643 | 1036     |
| 31657 | 1030     | 31663 | 1031     | 31667 | 1027     | 31687 | 1027     | 31699 | 1034     |
| 31723 | 1033     | 31727 | 1032     | 31729 | 1035     | 31741 | 1029     | 31751 | 1029     |
| 31771 | 1037     | 31793 | 1034     | 31799 | 1035     | 31817 | 1032     | 31847 | 1037     |
| 31859 | 1038     | 31873 | 1035     | 31883 | 1032     | 31891 | 1032     | 31907 | 1033     |
| 31963 | 1036     | 31973 | 1031     | 31981 | 1036     | 31991 | 1039     | 32003 | 1041     |
| 32027 | 1036     | 32029 | 1043     | 32051 | 1040     | 32057 | 1034     | 32059 | 1043     |
| 32069 | 1041     | 32077 | 1036     | 32083 | 1039     | 32089 | 1038     | 32099 | 1037     |
| 32119 | 1040     | 32141 | 1040     | 32143 | 1036     | 32159 | 1042     | 32173 | 1036     |
| 32189 | 1040     | 32191 | 1034     | 32203 | 1035     | 32213 | 1043     | 32233 | 1038     |
| 32251 | 1045     | 32257 | 1038     | 32261 | 1040     | 32297 | 1046     | 32299 | 1043     |
| 32309 | 1040     | 32321 | 1044     | 32323 | 1039     | 32327 | 1034     | 32341 | 1049     |
| 32359 | 1043     | 32363 | 1040     | 32369 | 1042     | 32371 | 1051     | 32377 | 1044     |
| 32401 | 1048     | 32411 | 1046     | 32413 | 1040     | 32423 | 1044     | 32429 | 1044     |
| 32443 | 1040     | 32467 | 1053     | 32479 | 1045     | 32491 | 1044     | 32497 | 1046     |
| 32507 | 1041     | 32531 | 1043     | 32533 | 1045     | 32537 | 1054     | 32561 | 1045     |
| 32569 | 1045     | 32573 | 1053     | 32579 | 1049     | 32587 | 1049     | 32603 | 1042     |
| 32611 | 1050     | 32621 | 1051     | 32633 | 1048     | 32647 | 1048     | 32653 | 1053     |
| 32693 | 1047     | 32707 | 1053     | 32713 | 1053     | 32717 | 1050     | 32719 | 1047     |
| 32771 | 1047     | 32779 | 1048     | 32783 | 1054     | 32789 | 1056     | 32797 | 1054     |
| 32803 | 1051     | 32831 | 1055     | 32833 | 1050     | 32839 | 1051     | 32843 | 1050     |
| 32887 | 1045     | 32909 | 1045     | 32911 | 1055     | 32917 | 1048     | 32933 | 1057     |
| 32941 | 1050     | 32957 | 1055     | 32969 | 1053     | 32971 | 1044     | 32983 | 1049     |
| 32993 | 1047     | 32999 | 1058     | 32999 | 1058     | 33013 | 1053     | 33023 | 1054     |
| 33037 | 1055     | 33049 | 1058     | 33053 | 1052     | 33071 | 1060     | 33073 | 1055     |
| 33091 | 1053     | 33107 | 1056     | 33113 | 1063     | 33119 | 1059     | 33149 | 1055     |
| 33161 | 1064     | 33179 | 1058     | 33181 | 1061     | 33191 | 1060     | 33199 | 1047     |
| 33211 | 1063     | 33223 | 1063     | 33247 | 1057     | 33287 | 1062     | 33289 | 1063     |
| $q$ | $t_R^1$ | $q$ | $t_R^2$ | $q$ | $t_R^3$ | $q$ | $t_R^4$ | $q$ | $t_R^5$ | $q$ | $t_R^6$ |
|-----|--------|-----|--------|-----|--------|-----|--------|-----|--------|-----|--------|
| 33311 | 1064 | 33317 | 1057 | 33329 | 1064 | 33331 | 1058 | 33343 | 1056 | 33347 | 1064 |
| 33349 | 1053 | 33353 | 1061 | 33359 | 1065 | 33377 | 1067 | 33391 | 1063 | 33403 | 1059 |
| 33409 | 1058 | 33413 | 1062 | 33427 | 1061 | 33457 | 1061 | 33461 | 1062 | 33469 | 1058 |
| 33479 | 1063 | 33487 | 1060 | 33493 | 1074 | 33503 | 1064 | 33521 | 1059 | 33529 | 1068 |
| 33533 | 1063 | 33547 | 1058 | 33563 | 1067 | 33569 | 1069 | 33577 | 1071 | 33581 | 1065 |
| 33587 | 1073 | 33589 | 1064 | 33599 | 1063 | 33601 | 1070 | 33613 | 1071 | 33617 | 1069 |
| 33619 | 1061 | 33623 | 1069 | 33629 | 1069 | 33637 | 1069 | 33641 | 1068 | 33647 | 1067 |
| 33679 | 1067 | 33703 | 1067 | 33713 | 1064 | 33721 | 1064 | 33739 | 1067 | 33749 | 1066 |
| 33751 | 1065 | 33757 | 1067 | 33767 | 1065 | 33769 | 1066 | 33773 | 1066 | 33791 | 1070 |
| 33797 | 1072 | 33809 | 1069 | 33811 | 1071 | 33827 | 1068 | 33829 | 1064 | 33851 | 1072 |
| 33857 | 1070 | 33863 | 1074 | 33871 | 1068 | 33889 | 1071 | 33893 | 1077 | 33911 | 1072 |
| 33923 | 1071 | 33931 | 1069 | 33937 | 1062 | 33941 | 1067 | 33961 | 1077 | 33967 | 1078 |
| 33997 | 1066 | 34019 | 1076 | 34031 | 1075 | 34033 | 1079 | 34039 | 1075 | 34057 | 1065 |
| 34061 | 1077 | 34123 | 1078 | 34127 | 1071 | 34129 | 1073 | 34141 | 1075 | 34147 | 1075 |
| 34157 | 1074 | 34159 | 1077 | 34171 | 1076 | 34183 | 1069 | 34211 | 1073 | 34213 | 1071 |
| 34217 | 1078 | 34231 | 1075 | 34253 | 1070 | 34259 | 1087 | 34261 | 1076 | 34267 | 1083 |
| 34273 | 1079 | 34283 | 1076 | 34297 | 1077 | 34301 | 1075 | 34303 | 1077 | 34313 | 1077 |
| 34319 | 1076 | 34327 | 1068 | 34337 | 1080 | 34351 | 1078 | 34361 | 1076 | 34367 | 1082 |
| 34369 | 1081 | 34381 | 1078 | 34403 | 1077 | 34421 | 1081 | 34429 | 1083 | 34439 | 1077 |
| 34457 | 1084 | 34469 | 1082 | 34471 | 1077 | 34483 | 1077 | 34487 | 1076 | 34499 | 1085 |
| 34501 | 1081 | 34511 | 1078 | 34513 | 1079 | 34519 | 1087 | 34537 | 1082 | 34543 | 1077 |
| 34549 | 1082 | 34583 | 1087 | 34589 | 1084 | 34591 | 1083 | 34603 | 1079 | 34607 | 1088 |
| 34613 | 1079 | 34631 | 1087 | 34649 | 1084 | 34651 | 1085 | 34667 | 1087 | 34673 | 1080 |
| 34679 | 1080 | 34687 | 1087 | 34693 | 1083 | 34703 | 1085 | 34721 | 1088 | 34729 | 1086 |
| 34739 | 1087 | 34747 | 1086 | 34757 | 1082 | 34759 | 1082 | 34763 | 1085 | 34781 | 1085 |
| 34807 | 1090 | 34819 | 1083 | 34841 | 1095 | 34843 | 1087 | 34847 | 1079 | 34849 | 1084 |
| 34871 | 1082 | 34877 | 1090 | 34883 | 1089 | 34897 | 1097 | 34913 | 1096 | 34919 | 1090 |
| 34939 | 1090 | 34949 | 1088 | 34961 | 1093 | 34963 | 1087 | 34981 | 1083 | 35023 | 1092 |
| 35027 | 1093 | 35051 | 1095 | 35053 | 1083 | 35059 | 1094 | 35069 | 1087 | 35081 | 1090 |
| 35083 | 1097 | 35089 | 1092 | 35099 | 1088 | 35107 | 1099 | 35111 | 1090 | 35117 | 1089 |
| 35129 | 1093 | 35141 | 1088 | 35149 | 1091 | 35153 | 1083 | 35159 | 1096 | 35171 | 1097 |
| 35201 | 1096 | 35221 | 1094 | 35227 | 1098 | 35251 | 1094 | 35257 | 1091 | 35267 | 1091 |
| 35279 | 1094 | 35281 | 1094 | 35291 | 1098 | 35311 | 1092 | 35317 | 1101 | 35323 | 1094 |
| 35327 | 1094 | 35339 | 1093 | 35353 | 1097 | 35363 | 1094 | 35381 | 1094 | 35393 | 1103 |
| 35401 | 1096 | 35407 | 1101 | 35419 | 1096 | 35423 | 1094 | 35437 | 1103 | 35447 | 1099 |
| $q$   | $t_2^R$ | $q$   | $t_2^R$ | $q$   | $t_2^R$ | $q$   | $t_2^R$ | $q$   | $t_2^R$ |
|-------|---------|-------|---------|-------|---------|-------|---------|-------|---------|
| 35449 | 1096    | 35461 | 1095    | 35491 | 1094    | 35507 | 1098    | 35509 | 1097    |
| 35527 | 1098    | 35531 | 1095    | 35533 | 1099    | 35537 | 1093    | 35543 | 1097    |
| 35573 | 1102    | 35591 | 1108    | 35593 | 1104    | 35597 | 1102    | 35603 | 1100    |
| 35671 | 1105    | 35677 | 1096    | 35729 | 1108    | 35731 | 1099    | 35747 | 1107    |
| 35759 | 1102    | 35771 | 1099    | 35797 | 1111    | 35801 | 1099    | 35803 | 1111    |
| 35831 | 1106    | 35837 | 1107    | 35839 | 1100    | 35851 | 1105    | 35863 | 1103    |
| 35879 | 1100    | 35897 | 1104    | 35909 | 1099    | 35911 | 1098    | 35923 | 1106    |
| 35951 | 1111    | 35963 | 1113    | 35969 | 1099    | 35977 | 1103    | 35983 | 1101    |
| 35999 | 1109    | 35999 | 1110    | 36007 | 1107    | 36011 | 1102    | 36013 | 1108    |
| 36037 | 1105    | 36061 | 1103    | 36067 | 1112    | 36073 | 1113    | 36083 | 1105    |
| 36107 | 1104    | 36109 | 1109    | 36131 | 1104    | 36137 | 1099    | 36151 | 1104    |
| 36187 | 1108    | 36191 | 1111    | 36209 | 1108    | 36217 | 1113    | 36229 | 1112    |
| 36251 | 1118    | 36263 | 1111    | 36269 | 1111    | 36277 | 1111    | 36293 | 1113    |
| 36307 | 1107    | 36313 | 1108    | 36319 | 1107    | 36341 | 1111    | 36343 | 1109    |
| 36373 | 1110    | 36383 | 1109    | 36389 | 1113    | 36433 | 1113    | 36451 | 1111    |
| 36467 | 1113    | 36469 | 1111    | 36473 | 1116    | 36479 | 1109    | 36493 | 1112    |
| 36523 | 1113    | 36527 | 1122    | 36529 | 1116    | 36541 | 1118    | 36551 | 1114    |
| 36563 | 1118    | 36571 | 1117    | 36583 | 1116    | 36587 | 1120    | 36599 | 1114    |
| 36629 | 1116    | 36637 | 1116    | 36643 | 1115    | 36653 | 1117    | 36671 | 1117    |
| 36683 | 1119    | 36691 | 1114    | 36691 | 1121    | 36709 | 1122    | 36713 | 1114    |
| 36739 | 1121    | 36749 | 1116    | 36761 | 1115    | 36767 | 1119    | 36779 | 1116    |
| 36787 | 1117    | 36791 | 1124    | 36793 | 1124    | 36809 | 1118    | 36821 | 1116    |
| 36847 | 1122    | 36857 | 1117    | 36871 | 1116    | 36877 | 1116    | 36887 | 1123    |
| 36901 | 1128    | 36913 | 1122    | 36919 | 1122    | 36923 | 1129    | 36929 | 1124    |
| 36943 | 1124    | 36947 | 1127    | 36973 | 1116    | 36979 | 1124    | 36997 | 1127    |
| 37013 | 1125    | 37019 | 1121    | 37021 | 1117    | 37039 | 1127    | 37049 | 1121    |
| 37061 | 1127    | 37087 | 1127    | 37097 | 1123    | 37117 | 1126    | 37123 | 1129    |
| 37159 | 1130    | 37171 | 1128    | 37181 | 1130    | 37189 | 1125    | 37199 | 1132    |
| 37217 | 1128    | 37223 | 1134    | 37243 | 1116    | 37253 | 1129    | 37273 | 1127    |
| 37307 | 1124    | 37309 | 1132    | 37313 | 1127    | 37321 | 1127    | 37337 | 1133    |
| 37357 | 1133    | 37361 | 1130    | 37363 | 1127    | 37369 | 1128    | 37379 | 1131    |
| 37409 | 1126    | 37423 | 1137    | 37441 | 1125    | 37447 | 1135    | 37463 | 1129    |
| 37489 | 1128    | 37493 | 1136    | 37501 | 1127    | 37507 | 1129    | 37511 | 1137    |
| 37529 | 1131    | 37537 | 1134    | 37547 | 1131    | 37549 | 1133    | 37561 | 1137    |
| 37571 | 1131    | 37573 | 1138    | 37579 | 1139    | 37589 | 1131    | 37591 | 1136    |
|       |         |       |         |       |         |       |         | 37607 | 1136    |
| q  | t^R_1 | q  | t^R_1 | q  | t^R_1 | q  | t^R_1 | q  | t^R_1 |
|----|-------|----|-------|----|-------|----|-------|----|-------|
| 37619 | 1128 | 37633 | 1132 | 37643 | 1137 | 37649 | 1133 | 37657 | 1133 | 37663 | 1129 |
| 37691 | 1130 | 37693 | 1131 | 37699 | 1132 | 37717 | 1135 | 37747 | 1142 | 37781 | 1135 |
| 37783 | 1147 | 37799 | 1135 | 37811 | 1139 | 37813 | 1138 | 37831 | 1142 | 37847 | 1142 |
| 37853 | 1138 | 37861 | 1139 | 37871 | 1139 | 37879 | 1144 | 37889 | 1134 | 37897 | 1139 |
| 37907 | 1138 | 37951 | 1131 | 37957 | 1135 | 37963 | 1137 | 37967 | 1143 | 37987 | 1128 |
| 37991 | 1136 | 37993 | 1131 | 37997 | 1137 | 38011 | 1136 | 38039 | 1139 | 38047 | 1142 |
| 38053 | 1141 | 38069 | 1146 | 38083 | 1144 | 38113 | 1141 | 38119 | 1139 | 38149 | 1139 |
| 38153 | 1138 | 38167 | 1152 | 38177 | 1140 | 38183 | 1143 | 38189 | 1147 | 38197 | 1146 |
| 38201 | 1147 | 38219 | 1138 | 38231 | 1145 | 38237 | 1139 | 38239 | 1141 | 38261 | 1142 |
| 38273 | 1138 | 38281 | 1146 | 38287 | 1146 | 38299 | 1148 | 38303 | 1139 | 38317 | 1145 |
| 38321 | 1145 | 38327 | 1148 | 38329 | 1145 | 38333 | 1144 | 38351 | 1149 | 38371 | 1142 |
| 38377 | 1143 | 38393 | 1149 | 38431 | 1149 | 38447 | 1151 | 38449 | 1150 | 38453 | 1148 |
| 38459 | 1145 | 38461 | 1155 | 38501 | 1145 | 38543 | 1139 | 38557 | 1145 | 38561 | 1150 |
| 38567 | 1148 | 38569 | 1145 | 38593 | 1146 | 38603 | 1148 | 38609 | 1153 | 38611 | 1150 |
| 38629 | 1148 | 38639 | 1148 | 38651 | 1154 | 38653 | 1147 | 38669 | 1155 | 38671 | 1142 |
| 38677 | 1148 | 38693 | 1155 | 38699 | 1148 | 38707 | 1157 | 38711 | 1144 | 38713 | 1152 |
| 38723 | 1153 | 38729 | 1151 | 38737 | 1148 | 38747 | 1154 | 38749 | 1147 | 38767 | 1153 |
| 38783 | 1151 | 38791 | 1154 | 38803 | 1153 | 38821 | 1149 | 38833 | 1152 | 38839 | 1152 |
| 38851 | 1159 | 38861 | 1156 | 38867 | 1157 | 38873 | 1146 | 38891 | 1157 | 38903 | 1158 |
| 38917 | 1164 | 38921 | 1146 | 38923 | 1152 | 38933 | 1160 | 38953 | 1158 | 38959 | 1152 |
| 38971 | 1156 | 38977 | 1157 | 38993 | 1159 | 39019 | 1153 | 39023 | 1159 | 39041 | 1155 |
| 39043 | 1163 | 39047 | 1157 | 39079 | 1158 | 39089 | 1158 | 39097 | 1155 | 39103 | 1160 |
| 39107 | 1152 | 39113 | 1163 | 39119 | 1162 | 39133 | 1160 | 39139 | 1158 | 39157 | 1153 |
| 39161 | 1161 | 39163 | 1158 | 39181 | 1153 | 39191 | 1166 | 39199 | 1156 | 39209 | 1158 |
| 39217 | 1155 | 39227 | 1168 | 39229 | 1156 | 39233 | 1162 | 39239 | 1162 | 39241 | 1158 |
| 39251 | 1160 | 39293 | 1156 | 39301 | 1164 | 39313 | 1166 | 39317 | 1160 | 39323 | 1159 |
| 39341 | 1163 | 39343 | 1163 | 39359 | 1164 | 39367 | 1160 | 39371 | 1159 | 39373 | 1162 |
| 39383 | 1160 | 39397 | 1161 | 39409 | 1160 | 39419 | 1156 | 39439 | 1158 | 39443 | 1162 |
| 39451 | 1167 | 39461 | 1171 | 39499 | 1169 | 39503 | 1163 | 39509 | 1158 | 39511 | 1168 |
| 39521 | 1163 | 39541 | 1168 | 39551 | 1174 | 39563 | 1161 | 39569 | 1164 | 39581 | 1161 |
| 39607 | 1167 | 39619 | 1167 | 39623 | 1158 | 39631 | 1166 | 39659 | 1161 | 39667 | 1162 |
| 39671 | 1159 | 39679 | 1174 | 39703 | 1172 | 39709 | 1164 | 39719 | 1167 | 39727 | 1170 |
| 39733 | 1170 | 39749 | 1174 | 39761 | 1166 | 39769 | 1173 | 39779 | 1168 | 39791 | 1176 |
| 39799 | 1170 | 39821 | 1164 | 39827 | 1171 | 39829 | 1171 | 39839 | 1171 | 39841 | 1169 |
| 39847 | 1174 | 39857 | 1174 | 39863 | 1165 | 39869 | 1177 | 39877 | 1167 | 39883 | 1165 |
| $q$ | $t^R_2$ | $q$ | $t^R_2$ | $q$ | $t^R_2$ | $q$ | $T_2y$ | $q$ | $t^R_2$ | $q$ | $t^R_2$ |
|-----|--------|-----|--------|-----|--------|-----|--------|-----|--------|-----|--------|
| 39887 | 1173 | 39910 | 1181 | 39929 | 1175 | 39937 | 1165 | 39953 | 1173 | 39971 | 1178 |
| 39979 | 1169 | 39983 | 1180 | 39989 | 1169 | 39989 | 1172 | 40009 | 1173 | 40013 | 1179 |
| 40031 | 1179 | 40037 | 1167 | 40039 | 1166 | 40063 | 1177 | 40087 | 1164 | 40093 | 1174 |
| 40099 | 1174 | 40111 | 1170 | 40123 | 1169 | 40127 | 1176 | 40129 | 1174 | 40151 | 1172 |
| 40153 | 1185 | 40163 | 1174 | 40169 | 1172 | 40177 | 1166 | 40189 | 1173 | 40193 | 1172 |
| 40213 | 1173 | 40231 | 1173 | 40237 | 1173 | 40241 | 1181 | 40253 | 1173 | 40277 | 1176 |
| 40283 | 1181 | 40289 | 1185 | 40343 | 1175 | 40351 | 1180 | 40357 | 1184 | 40361 | 1178 |
| 40387 | 1183 | 40423 | 1176 | 40427 | 1176 | 40429 | 1183 | 40433 | 1177 | 40459 | 1179 |
| 40471 | 1181 | 40483 | 1173 | 40487 | 1179 | 40493 | 1178 | 40499 | 1177 | 40507 | 1182 |
| 40519 | 1186 | 40529 | 1182 | 40531 | 1177 | 40543 | 1182 | 40559 | 1184 | 40577 | 1174 |
| 40583 | 1179 | 40591 | 1185 | 40597 | 1185 | 40609 | 1183 | 40627 | 1183 | 40637 | 1180 |
| 40639 | 1182 | 40693 | 1183 | 40697 | 1186 | 40699 | 1187 | 40709 | 1185 | 40739 | 1176 |
| 40751 | 1184 | 40759 | 1185 | 40763 | 1192 | 40771 | 1191 | 40787 | 1186 | 40801 | 1191 |
| 40813 | 1181 | 40819 | 1182 | 40823 | 1179 | 40829 | 1192 | 40841 | 1185 | 40847 | 1188 |
| 40849 | 1179 | 40853 | 1186 | 40867 | 1186 | 40879 | 1183 | 40883 | 1191 | 40897 | 1189 |
| 40903 | 1184 | 40927 | 1185 | 40933 | 1188 | 40939 | 1190 | 40949 | 1191 | 40961 | 1189 |
| 40973 | 1189 | 40993 | 1183 | 40997 | 1186 | 40999 | 1187 | 41009 | 1185 | 41020 | 1183 |
| 41047 | 1188 | 41051 | 1192 | 41057 | 1191 | 41077 | 1186 | 41081 | 1191 | 41113 | 1188 |
| 41117 | 1193 | 41131 | 1189 | 41141 | 1192 | 41143 | 1188 | 41149 | 1189 | 41161 | 1195 |
| 41177 | 1192 | 41179 | 1194 | 41183 | 1197 | 41189 | 1200 | 41201 | 1186 | 41203 | 1193 |
| 41213 | 1194 | 41221 | 1194 | 41227 | 1190 | 41231 | 1199 | 41233 | 1195 | 41243 | 1196 |
| 41257 | 1185 | 41263 | 1204 | 41269 | 1203 | 41281 | 1194 | 41299 | 1185 | 41333 | 1201 |
| 41341 | 1196 | 41351 | 1196 | 41357 | 1199 | 41381 | 1191 | 41387 | 1192 | 41389 | 1193 |
| 41399 | 1209 | 41411 | 1201 | 41413 | 1202 | 41443 | 1195 | 41453 | 1190 | 41467 | 1192 |
| 41479 | 1202 | 41491 | 1197 | 41507 | 1200 | 41513 | 1191 | 41519 | 1196 | 41521 | 1198 |
| 41539 | 1197 | 41543 | 1206 | 41549 | 1204 | 41579 | 1200 | 41593 | 1203 | 41597 | 1193 |
| 41603 | 1202 | 41609 | 1201 | 41611 | 1199 | 41617 | 1199 | 41621 | 1196 | 41627 | 1196 |
| 41641 | 1202 | 41647 | 1195 | 41651 | 1197 | 41659 | 1198 | 41669 | 1199 | 41681 | 1196 |
| 41687 | 1199 | 41719 | 1202 | 41729 | 1204 | 41737 | 1199 | 41759 | 1199 | 41761 | 1207 |
| 41771 | 1192 | 41777 | 1200 | 41801 | 1201 | 41809 | 1201 | 41813 | 1199 | 41843 | 1203 |
| 41849 | 1200 | 41851 | 1209 | 41863 | 1203 | 41879 | 1206 | 41887 | 1200 | 41893 | 1206 |
| 41897 | 1199 | 41903 | 1204 | 41911 | 1199 | 41927 | 1202 | 41941 | 1203 | 41947 | 1203 |
| 41953 | 1205 | 41957 | 1204 | 41959 | 1213 | 41969 | 1197 | 41981 | 1207 | 41983 | 1203 |
| 41999 | 1208 | 42013 | 1208 | 42017 | 1204 | 42019 | 1209 | 42023 | 1212 | 42043 | 1201 |
| 42061 | 1208 | 42071 | 1207 | 42073 | 1211 | 42083 | 1200 | 42089 | 1200 | 42101 | 1194 |
Table 1 Continue 21

| $q$ | $t_{y_2}^R$ | $q$ | $t_{y_2}^R$ | $q$ | $t_{y_2}^R$ | $q$ | $t_{y_2}^R$ | $q$ | $t_{y_2}^R$ |
|-----|-------------|-----|-------------|-----|-------------|-----|-------------|-----|-------------|
| 42131 | 1206 | 42139 | 1214 | 42157 | 1198 | 42169 | 1214 | 42179 | 1206 |
| 42187 | 1208 | 42193 | 1205 | 42197 | 1204 | 42209 | 1205 | 42221 | 1205 |
| 42227 | 1210 | 42239 | 1209 | 42257 | 1215 | 42281 | 1212 | 42283 | 1216 |
| 42299 | 1214 | 42307 | 1210 | 42323 | 1205 | 42331 | 1209 | 42337 | 1204 |
| 42359 | 1207 | 42373 | 1214 | 42379 | 1218 | 42391 | 1211 | 42397 | 1214 |
| 42407 | 1213 | 42409 | 1205 | 42433 | 1207 | 42437 | 1212 | 42443 | 1207 |
| 42457 | 1205 | 42461 | 1215 | 42463 | 1217 | 42467 | 1214 | 42473 | 1210 |
| 42491 | 1207 | 42499 | 1211 | 42509 | 1212 | 42533 | 1211 | 42557 | 1211 |
| 42571 | 1209 | 42577 | 1207 | 42589 | 1210 | 42611 | 1211 | 42641 | 1222 |
| 42649 | 1209 | 42667 | 1220 | 42677 | 1217 | 42683 | 1210 | 42689 | 1213 |
| 42701 | 1219 | 42703 | 1213 | 42709 | 1220 | 42719 | 1221 | 42727 | 1216 |
| 42743 | 1220 | 42751 | 1212 | 42767 | 1221 | 42773 | 1216 | 42787 | 1213 |
| 42797 | 1224 | 42821 | 1214 | 42829 | 1216 | 42839 | 1220 | 42841 | 1221 |
| 42859 | 1219 | 42863 | 1211 | 42899 | 1223 | 42901 | 1215 | 42923 | 1222 |
| 42937 | 1214 | 42943 | 1210 | 42953 | 1213 | 42961 | 1218 | 42967 | 1226 |
| 42989 | 1226 | 43003 | 1217 | 43013 | 1223 | 43019 | 1222 | 43037 | 1217 |
| 43051 | 1220 | 43063 | 1225 | 43067 | 1219 | 43093 | 1222 | 43103 | 1222 |
| 43133 | 1221 | 43151 | 1225 | 43159 | 1223 | 43177 | 1224 | 43189 | 1218 |
| 43207 | 1220 | 43223 | 1222 | 43237 | 1220 | 43261 | 1215 | 43271 | 1221 |
| 43291 | 1221 | 43313 | 1224 | 43319 | 1232 | 43321 | 1230 | 43331 | 1221 |
| 43397 | 1227 | 43399 | 1224 | 43403 | 1225 | 43411 | 1223 | 43427 | 1219 |
| 43451 | 1230 | 43457 | 1229 | 43481 | 1223 | 43487 | 1231 | 43499 | 1229 |
| 43541 | 1226 | 43543 | 1231 | 43573 | 1230 | 43577 | 1227 | 43579 | 1231 |
| 43597 | 1233 | 43607 | 1231 | 43609 | 1227 | 43613 | 1232 | 43627 | 1229 |
| 43649 | 1222 | 43651 | 1231 | 43661 | 1229 | 43669 | 1236 | 43691 | 1239 |
| 43717 | 1227 | 43721 | 1231 | 43753 | 1223 | 43759 | 1226 | 43777 | 1229 |
| 43783 | 1227 | 43787 | 1237 | 43789 | 1230 | 43793 | 1231 | 43801 | 1231 |
| 43867 | 1234 | 43889 | 1231 | 43891 | 1234 | 43913 | 1227 | 43933 | 1234 |
| 43951 | 1229 | 43961 | 1244 | 43963 | 1233 | 43969 | 1230 | 43973 | 1228 |
| 43991 | 1242 | 43997 | 1238 | 44017 | 1229 | 44021 | 1243 | 44027 | 1236 |
| 44041 | 1235 | 44053 | 1235 | 44059 | 1242 | 44071 | 1228 | 44087 | 1240 |
| 44101 | 1231 | 44111 | 1237 | 44119 | 1236 | 44123 | 1240 | 44129 | 1244 |
| 44159 | 1237 | 44171 | 1241 | 44179 | 1234 | 44189 | 1235 | 44201 | 1229 |
| 44207 | 1245 | 44221 | 1238 | 44249 | 1240 | 44257 | 1233 | 44263 | 1239 |
| 44269 | 1245 | 44273 | 1238 | 44279 | 1246 | 44281 | 1242 | 44293 | 1238 |

31
Table 1 Continue 22

|   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|
| q | $t^R_{q}$ | q | $t^R_{q}$ | q | $t^R_{q}$ | q | $T_{2yy}$ | q | $t^R_{q}$ | q | $t^R_{q}$ |
| 44357 | 1248 | 44371 | 1239 | 44381 | 1246 | 44383 | 1238 | 44389 | 1240 | 44417 | 1239 |
| 44449 | 1241 | 44453 | 1241 | 44483 | 1239 | 44491 | 1246 | 44497 | 1245 | 44501 | 1235 |
| 44507 | 1239 | 44519 | 1245 | 44531 | 1243 | 44533 | 1246 | 44537 | 1245 | 44543 | 1241 |
| 44549 | 1247 | 44563 | 1243 | 44579 | 1242 | 44587 | 1245 | 44617 | 1240 | 44621 | 1243 |
| 44623 | 1247 | 44633 | 1240 | 44641 | 1243 | 44647 | 1247 | 44651 | 1253 | 44657 | 1239 |
| 44683 | 1241 | 44687 | 1249 | 44699 | 1247 | 44701 | 1244 | 44711 | 1245 | 44729 | 1246 |
| 44741 | 1249 | 44753 | 1255 | 44771 | 1241 | 44773 | 1245 | 44777 | 1252 | 44789 | 1246 |
| 44797 | 1246 | 44809 | 1249 | 44819 | 1246 | 44839 | 1248 | 44843 | 1246 | 44851 | 1250 |
| 44867 | 1241 | 44879 | 1255 | 44887 | 1252 | 44909 | 1248 | 44917 | 1253 | 44981 | 1269 |
| 44927 | 1246 | 44939 | 1251 | 44953 | 1252 | 44959 | 1253 | 44963 | 1245 | 44971 | 1253 |
| 44983 | 1244 | 44987 | 1254 | 44987 | 1244 | 45007 | 1248 | 45013 | 1257 | 45053 | 1253 |
| 45061 | 1250 | 45077 | 1253 | 45083 | 1256 | 45119 | 1255 | 45121 | 1255 | 45127 | 1248 |
| 45131 | 1254 | 45137 | 1258 | 45139 | 1252 | 45161 | 1251 | 45179 | 1256 | 45181 | 1251 |
| 45191 | 1254 | 45197 | 1252 | 45233 | 1252 | 45247 | 1251 | 45259 | 1263 | 45263 | 1254 |
| 45281 | 1253 | 45289 | 1260 | 45293 | 1259 | 45307 | 1261 | 45317 | 1251 | 45319 | 1254 |
| 45329 | 1252 | 45337 | 1260 | 45413 | 1256 | 45427 | 1257 | 45361 | 1258 | 45377 | 1262 |
| 45389 | 1257 | 45403 | 1255 | 45413 | 1256 | 45427 | 1257 | 45433 | 1266 | 45439 | 1255 |
| 45481 | 1258 | 45491 | 1256 | 45497 | 1258 | 45503 | 1275 | 45523 | 1263 | 45533 | 1259 |
| 45541 | 1259 | 45553 | 1259 | 45557 | 1254 | 45569 | 1260 | 45587 | 1263 | 45589 | 1258 |
| 45599 | 1252 | 45613 | 1263 | 45631 | 1262 | 45641 | 1255 | 45659 | 1264 | 45667 | 1257 |
| 45673 | 1268 | 45677 | 1258 | 45691 | 1256 | 45697 | 1257 | 45707 | 1270 | 45737 | 1260 |
| 45751 | 1263 | 45757 | 1262 | 45763 | 1261 | 45767 | 1264 | 45779 | 1267 | 45817 | 1265 |
| 45821 | 1258 | 45823 | 1261 | 45827 | 1257 | 45833 | 1257 | 45841 | 1261 | 45853 | 1259 |
| 45863 | 1271 | 45869 | 1265 | 45887 | 1267 | 45893 | 1259 | 45943 | 1261 | 45949 | 1263 |
| 45953 | 1271 | 45959 | 1268 | 45971 | 1271 | 45979 | 1264 | 45989 | 1257 | 46021 | 1272 |
| 46027 | 1270 | 46049 | 1269 | 46051 | 1261 | 46061 | 1266 | 46073 | 1269 | 46091 | 1268 |
| 46093 | 1266 | 46099 | 1266 | 46103 | 1265 | 46133 | 1267 | 46141 | 1266 | 46147 | 1277 |
| 46153 | 1274 | 46171 | 1267 | 46181 | 1273 | 46183 | 1267 | 46187 | 1265 | 46199 | 1266 |
| 46219 | 1273 | 46229 | 1273 | 46237 | 1271 | 46261 | 1266 | 46271 | 1276 | 46273 | 1268 |
| 46279 | 1272 | 46301 | 1269 | 46307 | 1270 | 46309 | 1275 | 46327 | 1269 | 46337 | 1280 |
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