HumRRO
HUMAN RESOURCES RESEARCH ORGANIZATION

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Third-Party Checking of 2021 Scaling and Equating for the Kentucky Performance Rating for Educational Progress (K-PREP) Tests

Final Report

Prepared for:	Kentucky Department of Education Office of Assessment and Accountability 300 Sower Boulevard Frankfort, KY 40601	**Prepared under:**	Contract #1900004339
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Table of Contents

Executive Summary

Pearson and the Human Resources Research Organization (HumRRO) independently calibrated, scaled, and equated the 2021 Kentucky Performance Rating for Educational Progress (K-PREP) assessments and produced the raw-score-to-theta-score tables to be applied to students' test results. HumRRO further verified that scoring table were applied accurately by independently scoring students and then comparing our scoring results to Pearson's. Results calculated by HumRRO were identical to those calculated by Pearson (M. Johnson, email communication, July 6, 2021 (grades 4 and 11) and July 8, 2021 (grade 7) [science]; July 1, 2021 (grade 10), July 7, 2021 (grades 3-8), and July 9, 2021 (braille) [reading]; and July 1, 2021 (grade 10) and July 8, 2021 (grades 3-8) [math]. Given that HumRRO's results were identical to those of Pearson, we are assured that Pearson did not commit processing errors.

Third-Party Checking of 2021 Scaling and Equating for the Kentucky Performance Rating for Educational Progress (K-PREP) Tests

Introduction

Kentucky has been administering the Kentucky Performance Rating for Educational Progress (K-PREP) assessment since 2012. K-PREP assesses student performance on the Kentucky Academic Standards (KAS) using a combination of multiple choice, short answer, and extended response items. Student scores are estimated using a Rasch Item-Response Theory (IRT) model. As new test forms have been developed, an equating process has been implemented to allow for meaningful comparisons over the years of K-PREP's administration.

In spring 2021, K-PREP was administered in reading, mathematics, science, and on-demand writing. Reading and mathematics were assessed in grades 3 through 8 and grade 10; science in grades 4, 7, and 11; and on-demand writing in grades 5, 8, and 11.

This report describes how student test responses for the 2021 K-PREP assessments were used to create scale scores and place students in Novice, Apprentice, Proficient or Distinguished (NAPD) performance categories. The complex analyses to accomplish these tasks were conducted independently, but cooperatively, by both HumRRO and Pearson staff members. Several interim checks were conducted during the analyses and any discrepancies between the two companies was investigated and ultimately resolved. This process was conducted transparently among Pearson, HumRRO, Kentucky Department of Education (KDE), and Kentucky's psychometric consultant (Dr. Bill Auty of Education Measurement Consulting) via frequent email communications and daily conference calls. The process was guided by a specifications document created by Pearson[1] and regularly updated based on decisions before and during calibration. This documentation is vital for ensuring consistency of processing across years and for guiding psychometric processing in future years.

Changes in 2021

Reading and math assessments were introduced for grade 10 this year. In recent years, data from the state administration of the ACT were used for accountability purposes. Because standard setting has not yet occurred for these assessments, an intermediary solution was developed for defining the performance category cut scores. In 2019, scores for ACT reading and math were used to assign students to the NAPD performance categories. The distributions of students in the NAPD performance categories for the 2019 ACT tests were used as targets for the distribution of students in the 2021 K-PREP grade 10 reading and math performance categories.

In response to the COVID-19 pandemic's impact on schools during the 2020-2021 school year, the United States Department of Education (ED) waived accountability reporting requirements but maintained that states should continue to administer annual summative assessments. This led to a directive from KDE leadership to develop a simple, straightforward assessment focused on comparing current student performance to past student performance. It was KDE's intent that the time required for assessments should be limited to no more than one hour per subject.

[1] Kentucky Spring 2019 Psychometric Analysis Specifications v1.4.docx.

To meet this directive, items for all tests (except new tests for grade 10 Reading and Math) were drawn from previously administered K-PREP assessments. Across all assessments, test forms were also designed to include fewer items than what was typical in previous administrations.

Although most K-PREP subject/grade tests used previously administered items, item calibration was still necessary to determine the extent to which item parameters drifted from previous administrations due to changes in the testing population (i.e., not all students participated in testing due to COVID-19). As in previous years, items that were not suitable for Braille were omitted in developing separate raw-to-theta conversions for Braille testers. For the 2021 K-PREP administration, Braille accommodations were provided for Reading tests in grades 3, 4, 6, 7, and 10.

On-demand writing tests included only one prompt (as opposed to two), all of which were double-rated. A simple sum score was reported to students and therefore did not require any calibration or equating replication.

KDE opted to use a different reporting scale to highlight the uniqueness of the spring 2021 assessment and to dissuade inappropriate comparisons. The reporting scale used ranged from 100 to 200.

Analysis Procedures

New item parameters were generated (i.e., calibrated) for grade 10 reading and math, anchored item calibration and equating analyses were conducted to compute new raw-score-to-scale score tables for all other assessments. For each of these analyses, we followed the analysis specifications provided by Pearson, independently conducted analyses, and verified our results matched Pearson's results. Below we summarize HumRRO's processes and procedures for conducting these analyses.

Sample Identification and File Construction

We first applied exclusion rules to select the sample of student responses to include in the calibration analyses. Kentucky selects most of its student population for use in the calibration sample for scaling and equating. However, some students are purposefully exempted. KDE established a set of invalidation codes for excluding students in the calibration file. Kentucky's exemption rules only apply to students who receive accommodations (e.g., Braille forms, audio, large print, etc.), students with duplicate records (the same identification number and name), and students with blank total test score values. Pearson and HumRRO verified n-counts after this step.

The next step was to format all the grade/subject files to be read into the Winsteps IRT program and create Winsteps[2] control files to read the student responses and estimate item parameters. A sample control file is provided in Appendix A. HumRRO created specialized SAS and R programs to generate all input and control files automatically. The item documentation file was used to specify item types, location, keys, item use, and other important information. HumRRO and Pearson did not share programming or methodology for creating the input, control, or data files for Winsteps. However, both companies used the same raw student data files (containing all student responses). HumRRO followed the guidance provided by Pearson (with input from KDE) regarding the treatment of blank responses, condition codes, etc. in creating the input data files.

[2] HumRRO used Winsteps version 4.8.0.0 for this project.

Calibration and Scaling Procedures

Once input and control files were prepared, Winsteps software was used to calibrate test items. Multiple-choice items were fit to the Rasch measurement model and constructed-response items (short constructed response and extended response items) were fit to the Partial Credit Model (PCM). Both types of items were simultaneously calibrated in Winsteps and item difficulty parameters (logits) were produced. "Step parameters" were also produced for constructed response items. Step parameters tell us how the various points possible on the item relate to the item's overall difficulty and are important for generating scoring tables. These parameters are produced on the theta scale (a commonly used scale with a mean of 0 and a standard deviation of 1). Appendix B contains an example of item parameters for one grade subject (logits and step parameters). Pearson and HumRRO verified item parameter estimates after this step.

Equating Procedures

Two types of equating occurred for the K-PREP: (a) forms equating within a given test administration year and (b) equating across test administration years using common anchor items. The first of these, forms equating, is accomplished by calibrating all the items for a given grade/subject together. By calibrating all the items together (i.e., across all forms), this effectively equates the various forms for a given grade/subject such that test scores on form 2 and form 3, for example, are interchangeable in terms of difficulty. Form equating was necessary for the Science tests only. A single form was used for all other grade/subject tests.

For reading grades 3-8; math grades 3-8; and science 4, 7, and 11, we also needed to equate the current year's scores to be comparable to scores from prior years. To accomplish this, we first examined the stability of the linking items to ensure that item difficulty had not shifted excessively between administrations. We conducted the Robust Z statistical procedure to determine whether any linking items should be dropped from the equating process (Huynh & Meyer, 2010). Items with a substantial difference in item difficulty, as defined by the Pearson specifications, were not included as anchor items in equating. The resulting set of anchor items were then used to create the raw-score-to-scale-score tables. Since 2021 was the first year of operational administration for the new grade 10 reading and math tests, no year-to-year equating was conducted.

Raw-score-to-Scale-Score Procedures

We conducted an anchor item calibration for all tests (excluding reading and math grade 10, and on-demand writing) using Winsteps software to produce raw-score-to-scale-score tables. We provided the item parameters identified in the previous step to Winsteps as anchor values to compute the raw-score-to-scale score tables.

The item parameter estimates from the initial calibration for grade 10 reading and math tests and the item parameters estimates following the equating analyses for all other tests (except on-demand writing) were used to create scoring tables. We used Winsteps to estimate the raw-score-to-scale-score tables by providing the final item parameter estimates as anchor values.

Once theta scoring tables were obtained, they were linearly transformed to a reporting scale of 100-200 for all grade subjects. Performance levels (Novice, Apprentice, Proficient, and Distinguished; NAPD) were also assigned to each score. Cut scores for the performance levels (for all tests except grade 10 reading and math) were based on standard setting workshops conducted by Pearson. The results of those workshops included cut scores on the theta metric that can be used to assign NAPD categories to students. Scale score cuts were used, as opposed

to theta cuts, to assign performance levels to students' scale scores. Using these cuts allowed the scale scores associated with each performance level to be fixed across test administrations. HumRRO verified the raw-score-to-scale-score tables and the associated performance levels.

HumRRO-generated raw-score-to-scale score tables were compared to Pearson's raw-score-to-scale score tables for all grades and subjects. HumRRO matched Pearson's raw-score-to-scale score tables for all grades and subjects.

Verification of 2021 Scoring Tables

After verification of the raw-score-to-scale score tables, scoring tables were generated to assign student performance level classifications. HumRRO checked the 2021 scoring tables and verified that the correct scale score ranges were associated with each performance level. HumRRO matched Pearson on all grades and subjects.

Documentation

As HumRRO and Pearson completed each step of the process described above, Winsteps item parameter, anchor item, and score, and output files were shared to check for inconsistencies. Winsteps output files included the number of cases in the calibration sample, item-level information (e.g., p-values, parameters), and the theta scoring tables. A sample of the input and output files are appended to this document. They include:

1. Winsteps Control Files (Appendix A). These files contain the item parameter estimation specifications and important information for reading the student score files. It also specifies the output file names. The appendix includes an example control file for the initial item parameter estimation, equated item parameter estimation, and estimation of the cluster scores.

2. Winstep Item Parameter Files (Appendix B). These files contain the item parameters for the operational items. Each multiple-choice item has one parameter, a logit difficulty (named Measure in the Winstep files). Each constructed-response item has an overall difficulty parameter and a number of step parameters indicating how the points for the item are distributed along the theta scale. The file included in the appendix is an example of a final item parameter file. Initial item parameter files are in similar formats.

3. Winsteps Anchor File (Appendix C). The file includes the 2019 item parameter values for each anchor item with the equating shift estimate applied to the overall difficulty measure. The file is read by Winsteps and used to fix the item parameter values and estimate final score files.

4. Winsteps Score File (Appendix D). The file contains the raw score to theta estimation and includes the distribution of student scores.

Conclusion

Pearson and HumRRO independently calculated the scaled/equated raw-score-to-scale-score tables for the 2021 K-PREP science (grades 4, 7, 10), reading (grades 3-8, 10), and math (grades 3-8, 10). No differences were found between Pearson's and HumRRO's parameter estimations or raw-score-to-scale-score tables. Given that HumRRO's and Pearson's scaling and equating results were identical, HumRRO is confident that Pearson did not commit processing errors.

References

Huynh, H. & Meyer, P. (2010). Use of robust z in detecting unstable items in item response theory models. *Practical Assessment, Research & Evaluation,* 15(2). Available online: http://pareonline.net/getvn.asp?v=15&n=2

Appendix A – Control File (Reading Grade 8)

```
; WINSTEPS Control File

&INST
Item1 = 11
NI = 21
TABLES = 001000000000001000001000000001
CODES = 012
CSV = N
FITP = 3.0
FITI = 3.0
XWIDE = 1
HLINES = Y
data = KDE_RD_08.dat
IFILE = KDE_RD_08.ITM
ISFILE = KDE_RD_08.ISF
SFILE = KDE_RD_08.CSF
SCFILE = KDE_RD_08.RSS
PFILE = KDE_RD_08.PER
mprox = 10
mucon = 100
rconv = .50
lconv = .01
models = r
groups = 0
stkeep = n
realse = n
stbias = n
target = n
extrsc = 0.25
udecim = 4
uimean = 0
uscale = 1
ptbis = y
ILFILES = *
X201398
X201505
X201719
X201720
X201454
X201455
R8005
R8004
R8007
R8003
R8006
R8008
R8011
R8002
R8001
R8197
R8194
R8199
R8195
R8196
R8190
*
&END
END NAMES
*
```

Appendix B – Winsteps Item Parameter Files (Reading Grade 8)

Item parameters 2021 - Reading Grade 8 (KDE_RD_08.ITM)

```
; ITEM  C:\KDE_2021\Winsteps Output\Reading\KDE_RD_08.CON  Jul  6 2021 12:32
;ENTRY MEASURE ST   COUNT    SCORE MODLSE IN.MSQ INZSTD OUTMSQ OUTZST  DISPL   PBSX WEIGHT OBSMA EXPMA PBX-E  RMSR
WMLE INDF OUTDF G M R NAME
       1 -.6066 1 40833.0  28384.0   .0118    .98  -4.01    .95 -5.35 -.0013    .34   1.00  74.2  73.7   .31    .42 -
.6066 71812 21999 0 R . X201398
       2 -1.2802 1 40833.0  32704.0   .0134    .90  -9.90    .81 -9.90 -.0018    .38   1.00  82.4  81.1   .28   .35 -
1.2802 36437 9852 0 R . X201505
       3 -.0440 1 40833.0  24078.0  .0112   1.07   9.90   1.10   9.90 -.0001    .26   1.00  66.1  69.4   .33    .46 -
.0439 107E3 40726 0 R . X201719
       4 -.8526 1 40833.0  30082.0   .0123    .92  -9.90    .85 -9.90 -.0007    .38   1.00  77.9  76.3   .30    .39 -
.8526 56863 16357 0 R . X201720
       5 1.6402 1 40833.0  10982.0  .0123   1.11   9.90   1.27   9.90  .0018    .20   1.00  74.6  76.8   .31   .42
1.6402 53429 17962 0 R . X201454
       6 -.7851 1 40833.0  29632.0   .0121    .96  -7.05    .92 -7.68 -.0014    .34   1.00  76.6  75.6   .30    .40 -
.7851 60744 17746 0 R . X201455
       7 -1.2452 1 40833.0  32501.0   .0133    .88  -9.90    .75 -9.90 -.0021    .41   1.00  81.8  80.7   .28   .35 -
1.2452 37826 10264 0 R . R8005
       8 -1.9052 1 40833.0  35682.0   .0158    .87  -9.90    .65 -9.90 -.0015    .38   1.00  88.1  87.6   .24   .29 -
1.9051 18334 4863 0 R . R8004
       9   .3338 1 40833.0  20994.0   .0110   1.05   9.90   1.06   9.62 .0004    .28   1.00  66.3  68.4   .34   .46
.3338 117E3 50811 0 R . R8007
      10   .8212 1 40833.0  17017.0  .0112   1.05   9.90   1.10   9.90  .0009    .28   1.00  68.5  69.8   .33   .45
.8212 102E3 43792 0 R . R8003
      11   .4530 1 40833.0  20013.0   .0110    .94  -9.90    .93 -9.90  .0004    .39   1.00  71.2  68.4   .34   .44
.4530 116E3 51346 0 R . R8006
      12   .8210 1 40833.0  17019.0  .0112   1.02   4.83   1.04   5.40  .0007    .31   1.00  69.1  69.8   .33   .45
.8210 102E3 43794 0 R . R8008
      13 -.2262 1 40833.0  25522.0  .0113   1.10   9.90   1.19   9.90 -.0002    .22   1.00  67.0  70.4   .33    .46 -
.2262 96508 34043 0 R . R8011
      14 -1.0707 1 40833.0  31472.0   .0128    .95  -7.11    .92 -6.35 -.0021    .33   1.00  79.9  78.7   .29   .38 -
1.0706 45515 12604 0 R . R8002
      15 -.1881 1 40833.0  25223.0   .0113    .95  -9.90    .93 -9.85 -.0004    .38   1.00  72.7  70.2   .33    .43 -
.1881 98833 35425 0 R . R8001
      16   .7791 1 40833.0  17354.0  .0112   1.00    .60   1.05   6.79  .0010    .32   1.00  70.8  69.6   .33   .44
.7791 104E3 45161 0 R . R8197
      17   .4156 1 40833.0  20322.0  .0110   1.06   9.90   1.10   9.90  .0003    .27   1.00  65.9  68.4   .34   .46
.4156 116E3 51346 0 R . R8194
      18   .3836 1 40833.0  20583.0  .0110   1.08   9.90   1.11   9.90  .0007    .26   1.00  65.0  68.4   .34   .47
.3836 116E3 51238 0 R . R8199
      19 1.7122 1 40833.0  10515.0  .0125   1.03   4.67   1.17   9.90  .0019    .26   1.00  77.5  77.5   .31   .40
1.7122 49892 16471 0 R . R8195
      20 1.1753 1 40833.0  14264.0  .0115    .99  -1.96   1.05   5.62  .0012    .32   1.00  73.4  72.2   .33   .43
1.1753 80288 31072 0 R . R8196
      21 -.3310 1 40833.0  52123.0   .0083    .92  -9.90    .94 -9.31 -.0015    .46   1.00  57.3  57.6   .41    .58 -
.3310 52512 39446 0 R . R8190
```

Step parameters 2021 - Reading Grade 8 (KDE_RD_08.CSF)

```
; STRUCTURE-THRESHOLD MEASURE ANCHOR FILE FOR C:\KDE_2021\Winsteps Output\Reading\KDE_RD_08.CON Jul 6 2021
12:32
; ITEM CATEGORY Rasch-Andrich threshold MEASURE
     1  0   .0000
     1  1   .0000
     2  0   .0000
     2  1   .0000
     3  0   .0000
     3  1   .0000
     4  0   .0000
     4  1   .0000
     5  0   .0000
     5  1   .0000
     6  0   .0000
     6  1   .0000
     7  0   .0000
     7  1   .0000
     8  0   .0000
     8  1   .0000
     9  0   .0000
     9  1   .0000
    10  0   .0000
    10  1   .0000
    11  0   .0000
    11  1   .0000
    12  0   .0000
    12  1   .0000
    13  0   .0000
    13  1   .0000
    14  0   .0000
    14  1   .0000
    15  0   .0000
    15  1   .0000
    16  0   .0000
    16  1   .0000
    17  0   .0000
    17  1   .0000
    18  0   .0000
    18  1   .0000
    19  0   .0000
    19  1   .0000
    20  0   .0000
    20  1   .0000
    21  0   .0000
    21  1  -.8683
    21  2   .8683;
```

Appendix C – Winsteps Anchor File (Grade 8 Reading)

Item Anchor File (iaf_anchors08.IAF)

1	-0.6764	1	40833	28384		0.0118	0.98	-4.01	0.95	-5.35		-0.0013
0.34	1	74.2	73.7		0.31	0.42	-0.6066	71812	21999		0	R
.	X201398	NA										
2	-1.2688	1	40833	32704		0.0134	0.90	-9.90	0.81	-9.90		-0.0018
0.38	1	82.4	81.1		0.28	0.35	-1.2802	36437	9852		0	R
.	X201505	NA										
3	0.3931	1	40833	24078		0.0112	1.07	9.90	1.10	9.90		-0.0001
0.26	1	66.1	69.4		0.33	0.46	-0.0439	107000	40726		0	R
.	X201719	NA										
4	-0.0969	1	40833	30082		0.0123	0.92	-9.90	0.85	-9.90		-0.0007
0.38	1	77.9	76.3		0.30	0.39	-0.8526	56863	16357		0	R
.	X201720	NA										
5	1.6043	1	40833	10982		0.0123	1.11	9.90	1.27	9.90		0.0018
0.20	1	74.6	76.8		0.31	0.42	1.6402	53429	17962		0	R
.	X201454	NA										
6	-0.3684	1	40833	29632		0.0121	0.96	-7.05	0.92	-7.68		-0.0014
0.34	1	76.6	75.6		0.30	0.40	-0.7851	60744	17746		0	R
.	X201455	NA										
7	-1.2490	1	40833	32501		0.0133	0.88	-9.90	0.75	-9.90		-0.0021
0.41	1	81.8	80.7		0.28	0.35	-1.2452	37826	10264		0	R
.	R8005	NA										
8	-1.5539	1	40833	35682		0.0158	0.87	-9.90	0.65	-9.90		-0.0015
0.38	1	88.1	87.6		0.24	0.29	-1.9051	18334	4863		0	R
.	R8004	NA										
9	0.8326	1	40833	20994		0.0110	1.05	9.90	1.06	9.62		0.0004
0.28	1	66.3	68.4		0.34	0.46	0.3338	117000	50811		0	R
.	R8007	NA										
10	0.9297	1	40833	17017		0.0112	1.05	9.90	1.10	9.90		0.0009
0.28	1	68.5	69.8		0.33	0.45	0.8212	102000	43792		0	R
.	R8003	NA										
11	0.9580	1	40833	20013		0.0110	0.94	-9.90	0.93	-9.90		0.0004
0.39	1	71.2	68.4		0.34	0.44	0.4530	116000	51346		0	R
.	R8006	NA										
12	1.2722	1	40833	17019		0.0112	1.02	4.83	1.04	5.40		0.0007
0.31	1	69.1	69.8		0.33	0.45	0.8210	102000	43794		0	R
.	R8008	NA										
14	-0.2526	1	40833	31472		0.0128	0.95	-7.11	0.92	-6.35		-0.0021
0.33	1	79.9	78.7		0.29	0.38	-1.0706	45515	12604		0	R
.	R8002	NA										
15	0.3814	1	40833	25223		0.0113	0.95	-9.90	0.93	-9.85		-0.0004
0.38	1	72.7	70.2		0.33	0.43	-0.1881	98833	35425		0	R
.	R8001	NA										
16	1.0051	1	40833	17354		0.0112	1.00	0.60	1.05	6.79		0.0010
0.32	1	70.8	69.6		0.33	0.44	0.7791	104000	45161		0	R
.	R8197	NA										
18	0.8987	1	40833	20583		0.0110	1.08	9.90	1.11	9.90		0.0007
0.26	1	65.0	68.4		0.34	0.47	0.3836	116000	51238		0	R
.	R8199	NA										
19	1.5095	1	40833	10515		0.0125	1.03	4.67	1.17	9.90		0.0019
0.26	1	77.5	77.5		0.31	0.40	1.7122	49892	16471		0	R
.	R8195	NA										
20	1.4216	1	40833	14264		0.0115	0.99	-1.96	1.05	5.62		0.0012
0.32	1	73.4	72.2		0.33	0.43	1.1753	80288	31072		0	R
.	R8196	NA										
21	0.0900	1	40833	52123		0.0083	0.92	-9.90	0.94	-9.31		-0.0015
0.46	1	57.3	57.6		0.41	0.58	-0.3310	52512	39446		0	R
.	R8190	-0.8683										

Step Parameter Anchor File (saf_anchors08.SAF)

```
1       0       0
1       1       0
2       0       0
2       1       0
3       0       0
3       1       0
4       0       0
4       1       0
5       0       0
5       1       0
6       0       0
6       1       0
7       0       0
7       1       0
8       0       0
8       1       0
9       0       0
9       1       0
10      0       0
10      1       0
11      0       0
11      1       0
12      0       0
12      1       0
14      0       0
14      1       0
15      0       0
15      1       0
16      0       0
16      1       0
18      0       0
18      1       0
19      0       0
19      1       0
20      0       0
20      1       0
21      0       0
21      1       -1.3656
21      2       1.3656 ;
```

Appendix D – Winsteps Score File (Grade 8 Reading)

PERSON SCORE FILE FOR C:\KDE_2021\Winsteps Output\Reading\KDE_RD_08.CON Jul 6 2021 12:32 USCALE=1.00

SCORE	MEASURE	S.E.	INFO	NORMED	S.E.	FREQUENCY	%	CUM.FREQ.	%	PERCENTILE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
0	-4.9086	2.0221	.24	19		182	6	.0	6	.0	.1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
1	-3.4553	1.0439	.92	150		94	25	.1	31	.1	.1	.05	.10	.03	.07	.01	.06	.10	.18	.02	.01	.02	.01	.04	.08	.04	.01	.02	.02	.01	.01	.10
2	-2.6717	.7689	1.69	221		69	107	.3	138	.3	.2	.11	.20	.07	.14	.01	.13	.19	.32	.05	.03	.04	.03	.08	.17	.08	.03	.04	.04	.01	.02	.20
3	-2.1740	.6532	2.34	266		59	291	.7	429	1.1	.7	.17	.29	.11	.21	.02	.20	.28	.43	.08	.05	.07	.05	.12	.25	.12	.05	.07	.07	.02	.03	.30
4	-1.7919	.5880	2.89	300		53	572	1.4	1001	2.5	1.8	.23	.37	.15	.28	.03	.27	.37	.53	.11	.07	.10	.07	.17	.33	.17	.07	.10	.10	.03	.05	.41
5	-1.4715	.5465	3.35	329		49	924	2.3	1925	4.7	3.6	.30	.45	.19	.35	.04	.33	.44	.61	.14	.09	.13	.09	.22	.40	.22	.10	.13	.14	.04	.07	.52
6	-1.1889	.5184	3.72	355		47	1448	3.5	3373	8.3	6.5	.36	.52	.24	.42	.06	.40	.51	.67	.18	.12	.16	.12	.28	.47	.27	.12	.17	.17	.05	.09	.63
7	-.9308	.4988	4.02	378		45	1781	4.4	5154	12.6	10.4	.42	.59	.29	.48	.07	.46	.58	.73	.22	.15	.20	.15	.33	.53	.32	.15	.21	.21	.07	.11	.73
8	-.6890	.4853	4.25	400		44	2155	5.3	7309	17.9	15.3	.48	.64	.34	.54	.09	.52	.64	.77	.26	.18	.24	.18	.39	.59	.38	.19	.25	.25	.08	.13	.84
9	-.4582	.4764	4.41	421		43	2608	6.4	9917	24.3	21.1	.54	.69	.40	.60	.11	.58	.69	.81	.31	.22	.29	.22	.44	.65	.43	.22	.29	.30	.10	.16	.94
10	-.2339	.4712	4.50	441		43			2994	7.3	12911	31.6	28.0	.59	.74	.45	.65	.13	.63	.73	.84	.36	.26	.33	.26	.50	.70	.49	.27	.34	.35	.12	.20	1.04
11	-.0130	.4694	4.54	461		42			3205	7.8	16116	39.5	35.5	.64	.78	.51	.70	.16	.68	.77	.87	.41	.30	.39	.30	.55	.74	.54	.31	.39	.40	.15	.23	1.14
12	.2078	.4709	4.51	481		42			3405	8.3	19521	47.8	43.6	.69	.82	.56	.74	.19	.73	.81	.89	.47	.35	.44	.35	.61	.78	.60	.36	.45	.46	.18	.28	1.24
13	.4315	.4757	4.42	501		43			3490	8.5	23011	56.4	52.1	.74	.85	.62	.78	.23	.77	.84	.91	.52	.40	.49	.40	.66	.82	.65	.41	.50	.51	.22	.32	1.34
14	.6617	.4845	4.26	522		44			3300	8.1	26311	64.4	60.4	.78	.87	.67	.82	.27	.81	.87	.93	.58	.46	.55	.46	.71	.85	.70	.47	.56	.57	.26	.37	1.43
15	.9025	.4979	4.03	543		45			3252	8.0	29563	72.4	68.4	.82	.90	.72	.85	.32	.84	.90	.94	.64	.52	.61	.52	.76	.88	.75	.53	.62	.63	.31	.43	1.51
16	1.1596	.5174	3.74	567		47			2963	7.3	32526	79.7	76.0	.85	.92	.77	.88	.38	.87	.92	.96	.70	.58	.67	.58	.80	.90	.79	.59	.68	.68	.37	.50	1.60
17	1.4412	.5455	3.36	592		49			2712	6.6	35238	86.3	83.0	.89	.94	.82	.91	.45	.90	.94	.97	.75	.65	.73	.65	.84	.92	.84	.66	.74	.74	.43	.57	1.68
18	1.7604	.5871	2.90	621		53			2158	5.3	37396	91.6	88.9	.91	.95	.86	.93	.53	.93	.95	.98	.81	.72	.79	.72	.88	.94	.88	.73	.79	.80	.51	.64	1.75
19	2.1416	.6524	2.35	655		59			1710	4.2	39106	95.8	93.7	.94	.97	.90	.95	.62	.95	.97	.98	.86	.79	.84	.79	.91	.96	.91	.80	.85	.85	.61	.72	1.82
20	2.6383	.7683	1.69	700		69			1075	2.6	40181	98.4	97.1	.96	.98	.94	.97	.73	.97	.98	.99	.91	.86	.90	.86	.95	.98	.94	.87	.90	.91	.72	.81	1.89
21	3.4207	1.0433	.92	771		94			516	1.3	40697	99.7	99.0	.98	.99	.97	.99	.86	.99	.99	1.00	.96	.93	.95	.93	.97	.99	.97	.93	.95	.95	.85	.90	1.95
22	4.8729	2.0217	.24	902		182			136	.3	40833	100.0	99.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00