

Alabama High School Graduation Exam Student Review Guide: Mathematics

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Published by Enrichment Plus, LLC
PO Box 2755
Acworth, GA 30102
Toll Free: 1-800-745-4706 • Fax 678-445-6702
Web site: www.enrichmentplus.com

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Preface

The *Alabama High School Graduation Exam Student Review Guide: Mathematics* is written to help students review the skills needed to pass the Mathematics portion of the Alabama High School Graduation Exam, Third Edition (AHSGE). This comprehensive guide is based on the Alabama Standards and Objectives developed by the Alabama State Department of Education.

How To Use This Book

Students:

Passing the Alabama High School Graduation Exam (AHSGE) is required for graduation. The AHSGE is a multiple-choice exam given in five subject areas: Language, Reading Comprehension, Mathematics, Science, and Social Studies. This book is a review for the Mathematics portion of the AHSGE.

- ① Take the pre-test found in the front of this book. The pre-test covers all the math skills tested on the AHSGE in a format similar to the actual test. The pre-test is designed to identify areas that you need to review.
- ② Score the pre-test. Using the pre-test evaluation chart, circle the questions that you answered incorrectly.
- ③ For each question that you missed on the pre-test, review the corresponding sections in the book. Read the instructional material, do the practice exercises, and take the section review test at the end of each section.
- ④ After reviewing the skills, take the two practice tests (provided as separate booklets). These practice tests are written to look similar to the actual AHSGE; therefore, they will give you practice in taking the test.
- ⑤ After taking Practice Test 1 and/or Practice Test 2, use the practice test evaluation charts, which are found directly after each practice test, to identify areas for further review and practice. The practice test evaluation charts can be used in the same way as the pre-test evaluation chart.

Teachers:

This review guide is also intended to save you, the teacher, time in the classroom. It can be used for classroom instruction or for individual student review. Since this student guide offers review for ALL of the math skills necessary for passing the AHSGE in mathematics, it provides you one consolidated resource of material to help your students prepare for the exam.

- ① When teaching or tutoring individual students, use the strategy outlined above for students. By taking the pre-test, students can identify areas that need improvement. The pre-test evaluation chart directs the students to the sections they need to review for instruction and additional practice.
- ② For classroom study, use this guide to supplement lesson plans and to give additional review for skills tested on the AHSGE. Purchase a class set of guides for use in the classroom or assign guides to students for out-of-classroom work.
- ③ Assign the practice tests (provided in separate booklets) as comprehensive review tests.
- ④ Use the practice test evaluation charts found after each practice test to identify areas needing further review.
- ⑤ You may want to use the pre-test to establish a benchmark for each student. Score the pre-test by counting each question as 1 point. Then, after the students have completed all the exercises in the workbook, use one or both practice tests to gauge progress. You should see marked improvement between the initial and final benchmarks.
- ⑥ Please **DO NOT** photocopy materials from these guides or the practice test booklets. These guides are intended to be used as student workbooks, and individual pages should not be duplicated by any means without permission from the copyright holder. To purchase additional or specialized copies of sections in this book, please contact the publisher at 1-800-745-4706.

Standard and Objective Correlation Chart

The chart below correlates each standard and objective tested on the AHSGE in Mathematics as given in the Alabama State Department of Education to this student guide. The Text Section column gives the section numbers in the text where each standard and objective is reviewed. The Pretest and Practice Test columns give the question number(s) in those tests that correlate to each standard and objective.

Standard/Objective: Description	Text Section(s)	Pretest	Practice Test 1	Practice Test 2
I-1: Apply order of operations	Sections 2 and 3, 11.1, 11.2	1–4	2, 5, 12, 51	1, 8, 15, 21
I-2 Add and subtract polynomials	11.1 – 11.6	5–8	1, 9, 13, 17	18, 24, 41, 90
I-3 Multiply polynomials	Section 10, 12.1 – 12.4	9–13	6, 10, 33, 55	9, 46, 63, 78
I-4 Factor polynomials	Section 13	14–19	18, 21, 52, 69	60, 72, 77, 96
II-1 Solve multi-step equations	Section 4, 5.3	20–22	3, 22, 24, 38	64, 81, 84, 97
II-2 Solve quadratic equations	14.1 – 14.5	23–26	7, 19, 53, 56	5, 22, 61, 95
II-3 Solve systems of linear equations	19.1 – 19.5	27–29	20, 32, 41, 57	65, 85, 87, 91
II-4 Solve multi-step inequalities	6.1, 6.2, 6.3	30–32	4, 44, 45, 54	2, 59, 75, 82
III-1 Identify functions	17.4, 18.1, 18.3, 18.4, 18.6	33–38	31, 40, 58, 100	6, 11, 55, 94
III-2 Find the range of functions	18.1, 18.2, 18.5	39–42	8, 23, 27, 46	3, 27, 62, 80
IV-1 Find perimeter, circumference, area, volume	8.1 – 8.4, Section 9	43–47	11, 34, 66, 95	25, 48, 73, 89
IV-2 Find the distance, midpoint, slope	Section 15	48–50	25, 47, 72, 97	10, 23, 71, 76
V-1, 4 Graph: Linear Equations; Common Relations	Section 16, 17.1, 18.3, 18.4	51–54	36, 62, 81, 82, 83, 84	12, 26, 30, 58, 86, 93
V-2 Graph lines given certain conditions	16.1, 16.2, 16.4 – 16.7	55–58	15, 16, 49, 50	29, 56, 57, 98
V-3 Determine solution sets of inequalities	Section 6	59–62	35, 68, 71, 89	28, 45, 51, 54
VI-1 Translate: Verbal or Symbolic Graph: Equations or Inequalities	6.4, 6.6, 6.7, 7.1, 7.4, 16.7, 17.2, 17.3	63–66	28, 39, 48, 76, 79, 85	13, 16, 36, 43, 67, 88
VII-1 Apply properties and relationships between angles	Section 20	67–73	14, 37, 73, 87	14, 37, 53, 100
VII-2 Apply Pythagorean Theorem	Section 22	74–75	29, 43, 74, 90	32, 42, 49, 99
VII-3 Apply properties of similar polygons	Section 21	76–78	60, 88, 94, 96	35, 40, 50, 79
VII-4 Apply properties of geometric figures	8.3 – 8.5, 9.2, 11.7, 12.5, 14.6	79–84	42, 59, 61, 63	33, 39, 52, 66
VII-5 Determine measures of central tendency	Section 23	85–88	30, 78, 91, 98	34, 47, 68, 69
VII-6 Determine probabilities	Section 24	89–91	26, 65, 86, 93	17, 20, 38, 70
VII-7 Solve problems: Direct Variation	Section 5	92–95	75, 77, 92, 99	7, 74, 83, 92
VII-8 Solve problems: Algebraic Concepts	Section 7, 14.6, 19.6	96–100	64, 67, 70, 80	4, 19, 31, 44

Mathematics

Pre-Test

Introduction

Introduction

The pre-test that follows is designed to identify areas where you, the student, can improve your skills before or after taking the Alabama High School Graduation Exam (AHSGE) in Mathematics.

Directions

Read each question carefully and darken the circle corresponding to your answer choice. Once you have completed this pre-test, circle the questions you answered incorrectly on the pre-test evaluation chart on page 36. For each question that you missed on the pre-test, review the corresponding sections in the book as given in the evaluation chart. Read the instructional material, do the practice exercises, and take the section review test at the end of each section.

Purpose of the Pre-Test

The following pre-test can be used as practice for the AHSGE in Mathematics, but it is primarily a diagnostic tool to help you identify which skills you can improve in order to prepare better for the actual test. Any pre-test question answered incorrectly may identify a skill needing improvement or mastery. Review the corresponding skill(s) indicated in the Pre-Test Evaluation Chart by reading the instructional material on the given pages and completing the practice exercises and reviews. By reviewing each skill, you will improve mastery of the material to be tested on the Mathematics portion of the AHSGE and potentially increase the score you receive on that exam. (The practice tests, which are given in separate booklets, are provided to give you additional practice taking tests similar to the actual AHSGE in Mathematics.)

General Information About the AHSGE in Mathematics

The AHSGE in Mathematics will consist of 100 multiple-choice questions. You must obtain a score of 477 or higher on the exam to pass.

Mathematics Pre-Test

Simplify the following problems. Darken the circle corresponding to your answer choice.

1. Simplify: $(3 + 1)^2 \div 2 - 3^2 \cdot 2$

- A -10
- B -4
- C -2
- D 4

A B C D

5. Simplify: $3x^2 + xy + 2(x^2 - xy)$

- A $5x^2$
- B $5x^4$
- C $5x^2 - xy$
- D $5x^4 - x^2y^2$

A B C D

2. Simplify: $3x - y - (x - y)$

- A $4x - 2y$
- B $2x - 2y$
- C $2x + y$
- D $2x$

A B C D

6. Simplify: $3.5x - 2 + 0.5x + 1.5$

- A $2x - 3.5$
- B $2x + 0.5$
- C $4x + 3.5$
- D $4x - 0.5$

A B C D

3. Simplify: $|2.1 - 7.4| - 1.5$

- A -6.8
- B 3.8
- C 8
- D 11

A B C D

7. Simplify: $\frac{1}{3}x + \frac{1}{2}y + 2(\frac{1}{6}x + \frac{1}{4}y)$

- A $\frac{1}{3}x + \frac{1}{2}y$
- B $\frac{1}{6}x + y$
- C $x + y$
- D $\frac{2}{3}x + y$

A B C D

4. Simplify: $x + \frac{4x + 6x}{2}$

- A $6x$
- B $9x$
- C $11x$
- D $12x$

A B C D

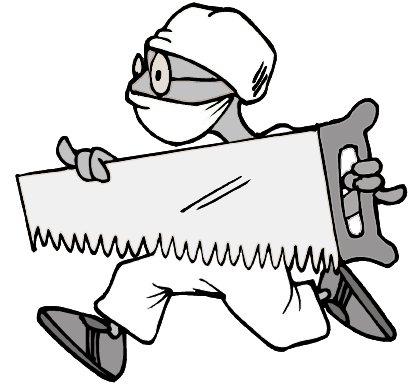
8. Simplify: $\frac{x + 4}{2} + \frac{3x - 6}{6}$

- A $x + 1$
- B $4x - 2$
- C $6x + 2$
- D $6x + 12$

A B C D

Simple Order of Operations

Section 2.1 Introduction to Order of Operations



If addition, subtraction, multiplication, and division are the simple math operations, what happens when you are given a math problem that includes more than one of these operations? You have to determine which to do first. The rules that determine what sequence to follow are called **order of operations**.

Example 1: $2 + 4 \cdot 5 = ?$

Can you see that there are two different ways of solving this problem? You can add first and then multiply, or you can multiply first and then add. Which way is the correct way? You get two different answers depending on how you solve this problem.

Add First, Then Multiply

$$6 \cdot 5 \stackrel{?}{=} 30 \quad \times$$

If you add first, $2 + 4$ is 6. Then once you multiply, you get $6 \cdot 5$, which is 30.

Multiply First, Then Add

$$2 + 20 \stackrel{?}{=} 22 \quad \checkmark$$

If you multiply first, $4 \cdot 5$ is 20. Then once you add, you get $20 + 2$, which is 22.

Which is right? This example shows why order of operations is so important. It tells you the correct sequence for solving math problems with mixed operations. The correct answer is 22. That means multiplication is to be done before addition.

The rules for simple arithmetic operations is to work the following order :

1. Multiplication or Division
2. Addition or Subtraction

As you can see, multiplication and division are on the same level, and addition and subtraction are on the same level. As long as you are deciding between operations on different levels, the order is clear. But what if you have multiple operations on the same level? Then a rule called the **Left Hand Rule** becomes very important. It says that when you have multiple operations on the same level, you simplify them from left to right. Consider the following example.

Example 2: $10 - 3 + 60 \div 6 \cdot 5$

In this problem, there is a division and a multiplication operation, and there is a subtraction and an addition operation. Remember, multiplication and division must be done first. To solve this problem, find the left most multiplication or division operation and solve. Repeat until there are no more multiplication or division operations. Then do the same thing for the addition and subtraction operations. The correct order for solving this problem is given below.

$$\textcircled{1} \quad 10 - 3 + \boxed{60 \div 6} \cdot 5$$

$$\textcircled{2} \quad 10 - 3 + \boxed{10 \cdot 5}$$

According to the order of operations, $60 \div 6$ and $6 \cdot 5$ are the two operations that must be performed first. According to the left hand rule, $60 \div 6$ should be done first because it is farther left than $6 \cdot 5$.

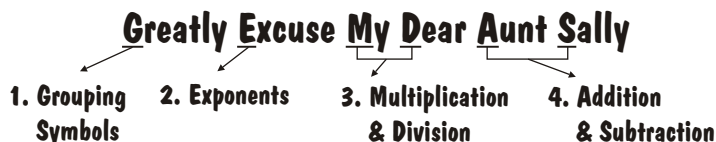
Now perform the next left-most multiplication or division operation. There is only one left, $10 \cdot 5$.

Algebra Basics

Section 3.8 Order of Operations for Algebraic Expressions



You've already practiced using the correct order of operations for signed numbers. Now, let's look at how to use the correct order of operations for simplifying algebraic expressions. Simplifying these types of problems is not brain surgery. You just have to be careful. Do you remember this silly sentence?



Example 1: Simplify $2x + y - 5(x + 4y)$

You have already reviewed all of the skills you need to solve this problem. Now all you have to remember is the order. Study the steps below.

$$\textcircled{1} \quad 2x + y - \underline{5}(x + 4y)$$

Grouping symbols must be simplified first. In this problem, the parentheses are a grouping symbol. The terms in the parentheses cannot be combined because they are not *like terms*, BUT you can use the distributive property to multiply both terms by the constant outside of the parentheses.

Be careful with the 5 outside the parentheses. The negative sign goes with the number and must be distributed to both terms inside the parentheses.

$$\textcircled{2} \quad 2x + y + \boxed{(-5) \cdot x} + \boxed{(-5) \cdot 4y}$$

Multiplication is the next operation to perform.

$$\textcircled{3} \quad 2x + y - 5x - 20y$$

Use the associative and commutative properties to rearrange the terms and to group like terms together.

$$\textcircled{4} \quad \boxed{(2x - 5x)} + \boxed{(y - 20y)}$$

The last step is to combine like terms using addition and subtraction.

$$\textcircled{5} \quad -3x - 19y$$

This expression is now simplified!

Section 3.8, continued
Order of Operations
for Algebraic Expressions

Example 2: Simplify $6x - \frac{5x + x}{2 + 1}$

Now the grouping symbol is the fraction bar. Look at the steps below.

① $6x - \frac{5x + x}{2 + 1}$

Since the fraction bar is a grouping symbol, the operations above the bar and below the bar must be performed first. Combine the like terms.

$6x - \frac{6x}{3}$

② $6x - \frac{\cancel{3} \cdot 2 \cdot x}{\cancel{3}}$

Now factor the numerator. Three is a common factor that will cancel out.

③ $6x - 2x$

These are like terms that can be combined by subtraction (also known as “collecting terms”).

④ $4x$

The expression simplifies to $4x$.

Practice

Simplify the following algebraic expressions by using the correct order of operations. Show your work. Record your answers in the blanks.

<p>1. $5(3x + 4) + x$</p> <p>_____</p>	<p>2. $-3(x - y) - 2x + y$</p> <p>_____</p>	<p>3. $3x - 8 - (x - 3)$</p> <p>_____</p>
<p>4. $6x + \frac{2x - 4}{2}$</p> <p>_____</p>	<p>5. $\frac{3x - 9x}{3} - 2x$</p> <p>_____</p>	<p>6. $2x - \frac{6x - 9}{3}$</p> <p>_____</p>

Similar Polygons

Section 21.1 Introducing Similarity



This is part of a conversation overheard on the way to geometry class.

First girl: “Your book bag is just like mine!”

Second girl: “No, it’s not!”

First girl: “It is, too. It has the same shape and everything.”

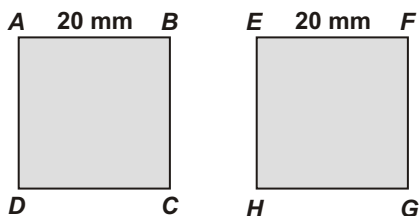
Second girl: “But it’s a different color.”

First girl: “That doesn’t matter; they still look alike.”

Second girl: “Alike yes, but not exactly the same. Besides, mine is bigger.”

First girl: “OK, OK maybe they’re not exactly alike — but they are similar.”

When it comes to geometry, the idea of objects being exactly alike or just similar is called **congruence** and **similarity**. For objects to be congruent, they must be exactly alike in both size and shape. In similarity, the shape is the same, but the size is different. The first girl was right about one thing: color doesn’t matter. Let’s look at something a little easier to compare than book bags.

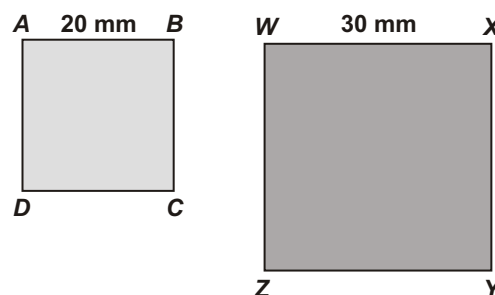


Square $ABCD$ is congruent to square $EFGH$.

$$ABCD \cong EFGH$$

Consider the shape of a square. In a square, all the sides have the same length, and all the angles have the same measure. If you have two squares with the same side lengths, then everything else is equal as well. You could actually pick up the first square and place it on the second square, and everything would exactly match. If both objects are exactly the same, they’re **congruent**. Square $ABCD$ is congruent to square $EFGH$. The symbol (\cong) means *congruent*.

Now consider the same two squares, but change the side length of one to 30 mm. They still look alike, but they aren’t exactly the same. The angles are still the same, but the size has changed. Rather than being equal, the side lengths are now proportional. The squares are now **similar** — alike, but not exactly the same. The symbol for *similar* is (\sim). (If you don’t remember what proportional means, that’s okay. We’ll explain it again later.)



Square $ABCD$ is similar to square $WXYZ$.

$$ABCD \sim WXYZ$$

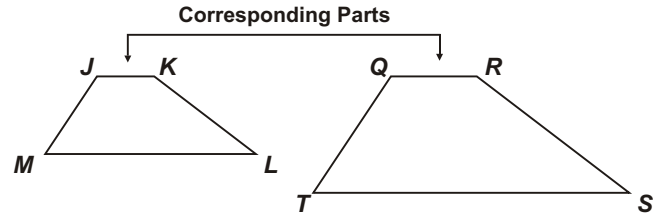
Corresponding Parts

When two geometric figures are similar, parts on one figure will correspond to parts on the other figure. Corresponding parts can include vertices, sides, and angles. The corresponding sides are not the same length, but they are in the same position on the figure (relative to the rest of the figure).

Polygons (any closed geometric figure with three or more sides) can be named by listing their vertices. When naming a polygon, start at any vertex and list the vertices either clockwise or counter-clockwise. To name a second, similar polygon, the order of the vertices must be the same because the order indicates which point on the first figure corresponds to the similar point on the second figure.

Section 21.1, continued
Introducing Similarity

An irregularly shaped polygon may help you to better understand corresponding parts. Look at the two trapezoids on the right. Trapezoid $JKLM$ is similar to trapezoid $QRST$. On the diagram, you can see that side JK corresponds to side QR . Can you list the other corresponding sides? They are KL with RS , LM with ST , and MJ with TQ .

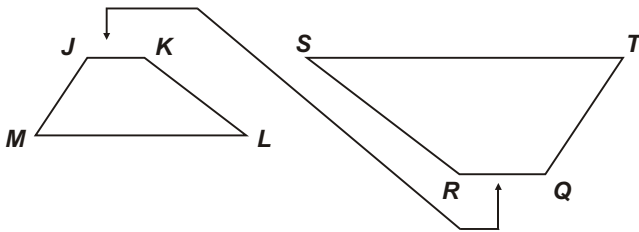


$JKLM$
 $\downarrow \downarrow \downarrow \downarrow$
 $QRST$

Just by looking at the names, you can also determine which parts correspond to which. The positions of the corresponding points line up in the names. Point J corresponds to point Q , point K to point R , point L to point S , and point M to point T .

Vertices and sides are not the only corresponding parts. Angles also correspond. The corresponding angles in these similar trapezoids are $\angle J$ and $\angle Q$, $\angle K$ and $\angle R$, $\angle L$ and $\angle S$, $\angle M$ and $\angle T$.

What happens if two similar figures are not oriented the same way? Then looking at the names may help you to identify which parts are similar.



In the diagram to the right, trapezoid $JKLM$ is still similar to trapezoid $QRST$, but it's more difficult to "see" the corresponding parts on the diagrams. Vertex J still corresponds to vertex Q , but since the figures are oriented differently, one is on the top of the figure and the other is on the bottom. Side JK still corresponds to side QR . Angle M still corresponds to angle T .

Which side corresponds to KL ? Look at the names. KL corresponds to RS .

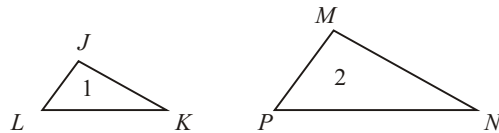
$JKLM \sim QRST$
 $\uparrow \quad \quad \downarrow$

Practice

Each pair of figures below is similar. For each side or angle given on figure 1, identify the corresponding side or angle on figure 2. The first one is done for you as an example.

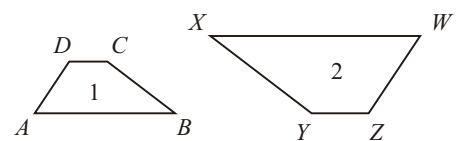
triangle $JKL \sim$ triangle MNP

- MN 1. Side JK
- 2. Side KL
- 3. Side JL



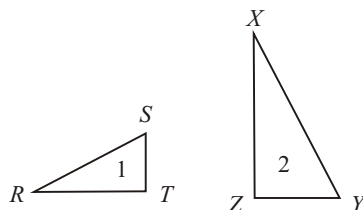
trapezoid $ABCD \sim$ trapezoid $WXYZ$

- 7. Side BC
- 8. Side AD
- 9. Side CD
- 10. Angle D



triangle $RST \sim$ triangle XYZ

- 4. Side ST
- 5. Side TR
- 6. Angle R



Mathematics Practice Test 1

25. A line segment begins at point $(-1, -2)$ and ends at point $(5, 6)$. What is the slope of the line segment?

Slope formula: $m = \frac{y_2 - y_1}{x_2 - x_1}$

- A 1
- B -1
- C $\frac{4}{3}$
- D $\frac{3}{4}$

(A) (B) (C) (D)

28. A pizza delivery company runs a special. They charge \$7.00 per large pizza plus a \$2.00 delivery charge. Which equation could be used to find the total cost for x pizzas?

- A $y = 7x + 2$
- B $y = (7 + 2)x$
- C $y = 2x + 7$
- D $y = \frac{x}{7} + 2$

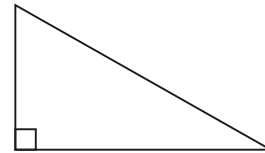
(A) (B) (C) (D)

26. A jar of candy contains 12 orange-flavored pieces, 10 cherry-flavored pieces, 5 lemon-flavored pieces, and 8 sour-apple flavored pieces. If a piece of candy is chosen randomly, what is the probability that it will be either lemon-flavored or cherry-flavored?

- A $\frac{1}{7}$
- B $\frac{3}{7}$
- C $\frac{2}{35}$
- D $\frac{2}{49}$

(A) (B) (C) (D)

29. Which set of numbers could be the lengths of the sides of a right triangle?



- A $\{2, 2, 3\}$
- B $\{4, 5, 6\}$
- C $\{5, 12, 13\}$
- D $\{6, 8, 12\}$

(A) (B) (C) (D)

27. If $f(x) = -x^2 + 3$, what is $f(-1)$?

- A 1
- B 2
- C 4
- D 5

(A) (B) (C) (D)

30. What is the mode of the following data set?

4, 5, 5, 3, 8, 5, 4, 2, 5, 2

- A 4.2
- B 4.5
- C 5
- D 6

(A) (B) (C) (D)

Practice Test 1

Evaluation Chart

Note: *Section 1* covers basic skills that should be reviewed first before going on to the more specific skills listed for each question below.

If you missed question #:	Go to section(s):	If you missed question #:	Go to section(s):	If you missed question #:	Go to section(s):
1	3.1, 3.2, 3.3, 11.1	35	6.4, 6.6	69	13.1, 13.4
2	3.1, 3.2, 3.3, 3.5, 3.8, 11.1, 11.2	36	16.2, 18.3, 18.4	70	7.1, 7.2, 19.3, 19.4, 19.5, 19.6
3	3.3, 4.1, 4.2, 4.4, 4.5, 4.6	37	20.1, 20.2, 20.3, 20.5	71	6.1, 6.4, 6.5, 6.6
4	6.1, 6.3	38	4.1, 4.2, 4.3, 4.4	72	15.1, 15.2, 15.3
5	2.1, 2.2, 2.3, 2.4	39	6.4, 6.6, 6.7	73	20.1, 20.2, 20.3, 20.8, 20.9, 20.10
6	12.2, 12.3	40	17.2, 17.3, 17.4, 18.1, 18.6	74	20.1, 20.2, 22.1, 22.2, 22.3, 22.4
7	13.4, 14.2	41	19.1, 19.3, 19.4, 19.5	75	5.1, 5.2, 5.3, 5.4, 5.5
8	18.1, 18.2	42	8.5, 9.1, 14.2, 14.5, 14.6	76	7.1
9	3.1, 3.2, 3.3, 3.4, 3.5, 3.8, 11.1, 11.2	43	20.1, 20.2, 22.1, 22.2, 22.3, 22.4	77	5.1, 5.2, 5.3, 5.4, 5.5
10	4.3, 10.1, 10.2, 10.3	44	6.1, 6.2	78	23.1, 23.6
11	8.1, 9.3	45	6.1, 6.3	79	7.1
12	3.1, 3.3, 3.6, 3.7, 3.8	46	18.1, 18.5	80	7.1, 7.2, 7.4, 7.5, 7.7
13	3.3, 3.5, 3.8, 11.1, 11.3, 11.4, 11.5	47	15.1, 15.4, 15.5	81	18.3, 18.4
14	20.1, 20.2, 20.3, 20.5, 20.6, 20.7	48	15.1, 15.3, 17.3	82	15.1, 15.2, 16.6, 16.7
15	15.1, 15.2, 16.1	49	15.1, 15.2, 16.4, 16.5, 16.6, 16.7	83	15.1, 15.2, 16.6, 16.7
16	15.1, 15.2, 16.2	50	15.1, 15.2, 16.4, 16.5	84	15.1, 15.2, 16.3, 18.3
17	2.1, 2.2, 3.1, 3.2, 3.3, 11.1	51	2.1, 2.2, 2.5	85	16.6, 16.7, 17.3
18	13.1, 13.3	52	13.1, 13.2, 13.6, 13.7	86	24.1, 24.2, 24.3
19	13.1, 13.2, 14.3	53	4.2, 13.1, 13.7, 14.1, 14.5	87	20.1, 20.2, 20.3, 20.5, 20.6, 20.7
20	19.1, 19.3, 19.4, 19.5	54	6.1, 6.3	88	21.1, 21.2, 21.3
21	13.1	55	10.1, 10.2, 10.4	89	6.1, 6.3, 6.4, 6.5, 6.7
22	4.1, 4.2, 4.4, 4.5, 4.6, 5.3	56	13.3, 14.4	90	22.1, 22.2, 22.3
23	18.1, 18.2	57	19.1, 19.3, 19.4, 19.5	91	23.1, 23.4
24	4.1, 4.2, 4.4, 4.5, 5.3	58	18.1	92	5.1, 5.2, 5.3, 5.4, 5.5, 5.7
25	15.1, 15.2, 15.3	59	8.1, 11.7	93	24.1, 24.2
26	24.1, 24.2, 24.5	60	21.1, 21.2	94	21.1, 21.2, 21.3, 21.4
27	18.1, 18.2	61	3.6, 3.7, 8.4, 12.1, 12.5	95	8.2, 8.3
28	7.1, 7.4	62	15.1, 15.2, 16.6, 16.7	96	21.1, 21.2, 21.3, 21.4
29	20.1, 20.2, 22.1, 22.2, 22.3	63	9.1	97	15.1, 15.6
30	23.1, 23.5	64	7.1, 7.2, 7.3	98	23.1, 23.2, 23.3
31	18.1, 18.3	65	24.1, 24.2, 24.4	99	5.1, 5.2, 5.3, 5.4, 5.5, 5.6
32	16.6, 16.7, 19.1, 19.2	66	8.4	100	18.1, 18.4
33	4.3, 12.2, 12.3, 12.4	67	7.1, 7.2, 19.3, 19.4, 19.5, 19.6		
34	8.1	68	6.1, 6.3, 6.4, 6.5		