SHSAT Mathematics Prep 2019

A Comprehensive Review and Ultimate Guide to the SHSAT Math Test

- **2** Full-Length SHSAT Math Practice Exams
- **2,500 +** Math problems with answers
- A comprehensive review of everything on SHSAT Math

Reza Nazari & Ava Ross

www.EffortlessMath.com

… So Much More Online!

- ✓ FREE Math lessons
- ✓ More Math learning books!
- ✓ Mathematics Worksheets
- ✓ Online Math Tutors

Need a PDF version of this book?

Visit www.EffortlessMath.com

Or send email to: info@EffortlessMath.com

SHSAT Mathematics Prep 2019

A Comprehensive Review and Ultimate Guide to the SHSAT Math Test

By

Reza Nazari & Ava Ross

Copyright © 2018

Reza Nazari & Ava Ross

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, scanning, or otherwise, except as permitted under Section 107 or 108 of the 1976 United States Copyright Ac, without permission of the author.

All inquiries should be addressed to:

info@effortlessMath.com

www.EffortlessMath.com

ISBN-13: 978-1-970036-15-2

ISBN-10: 1-970036-15-X

Published by: Effortless Math Education

www.EffortlessMath.com

Description

SHSAT Mathematics Prep 2019 provides students with the confidence and math skills they need to succeed on the SHSAT Math, building a solid foundation of basic Math topics with abundant exercises for each topic. It is designed to address the needs of SHSAT test takers who must have a working knowledge of basic Math.

This comprehensive book with over 2,500 sample questions and 2 complete SHSAT tests is all you need to fully prepare for the SHSAT Math. It will help you learn everything you need to ace the math section of the SHSAT.

Effortless Math unique study program provides you with an in-depth focus on the math portion of the test, helping you master the math skills that students find the most troublesome.
This book contains most common sample questions that are most likely to appear in the mathematics section of the SHSAT.

Inside the pages of this comprehensive SHSAT Math book, students can learn basic math operations in a structured manner with a complete study program to help them understand essential math skills. It also has many exciting features, including:

- Dynamic design and easy-to-follow activities
- A fun, interactive and concrete learning process
- Targeted, skill-building practices
- Fun exercises that build confidence
- Math topics are grouped by category, so you can focus on the topics you struggle on
- All solutions for the exercises are included, so you will always find the answers
- 2 Complete SHSAT Math Practice Tests that reflect the format and question types on SHSAT

SHSAT Mathematics Prep 2019 is an incredibly useful tool for those who want to review all topics being covered on the SHSAT test. It efficiently and effectively reinforces learning outcomes through engaging questions and repeated practice, helping you to quickly master basic Math skills.

About the Author

Reza Nazari is the author of more than 100 Math learning books including:
– Math and Critical Thinking Challenges: For the Middle and High School Student
– HiSET Math in 30 Days.
– GED Math Workbook 2018 – 2019
– Effortless Math Education Workbooks
– and many more Mathematics books …

Reza is also an experienced Math instructor and a test–prep expert who has been tutoring students since 2008. Reza is the founder of Effortless Math Education, a tutoring company that has helped many students raise their standardized test scores—and attend the colleges of their dreams. Reza provides an individualized custom learning plan and the personalized attention that makes a difference in how students view math.

You can contact Reza via email at:
reza@EffortlessMath.com

Find Reza's professional profile at:
goo.gl/zoC9rJ

Contents

Chapter 1: Fundamentals and Building Blocks 12
Simplifying Fractions 13
Adding and Subtracting Fractions 14
Multiplying and Dividing Fractions 15
Adding Mixed Numbers 16
Subtract Mixed Numbers 17
Multiplying Mixed Numbers 18
Dividing Mixed Numbers 19
Comparing Decimals 20
Rounding Decimals 21
Adding and Subtracting Decimals 22
Multiplying and Dividing Decimals 23
Converting Between Fractions, Decimals and Mixed Numbers 24
Factoring Numbers 25
Greatest Common Factor 26
Least Common Multiple 27
Test Preparation 28
Answers of Worksheets – Chapter 1 30
Chapter 2: Real Numbers and Integers 37
Adding and Subtracting Integers 38
Multiplying and Dividing Integers 39
Ordering Integers and Numbers 40
Arrange, Order, and Comparing Integers 41
Order of Operations 42
Mixed Integer Computations 43
Integers and Absolute Value 44
Test Preparation 45
Answers of Worksheets – Chapter 2 47
Chapter 3: Proportions and Ratios 51
Writing Ratios 52
Simplifying Ratios 53

Create a Proportion 54
Similar Figures 55
Simple Interest 56
Ratio and Rates Word Problems 57
Test Preparation 58
Answers of Worksheets – Chapter 3 60
Chapter 4: Percent 64
Percentage Calculations 65
Converting Between Percent, Fractions, and Decimals 66
Percent Problems 67
Find What Percentage a Number Is of Another 68
Find a Percentage of a Given Number 69
Percent of Increase and Decrease 70
Markup, Discount, and Tax 71
Test Preparation 72
Answers of Worksheets – Chapter 4 74
Chapter 5: Algebraic Expressions 79
Expressions and Variables 80
Simplifying Variable Expressions 81
Simplifying Polynomial Expressions 82
Translate Phrases into an Algebraic Statement 83
The Distributive Property 84
Evaluating One Variable 85
Evaluating Two Variables 86
Combining like Terms 87
Test Preparation 88
Answers of Worksheets – Chapter 5 90
Chapter 6: Equations 94
One–Step Equations 95
One–Step Equation Word Problems 96
Two–Step Equations 97
Two–Step Equation Word Problems 98

Multi–Step Equations 99
Test Preparation 100
Answers of Worksheets – Chapter 6 102
Chapter 7: Systems of Equations 106
Solving Systems of Equations by Substitution 107
Solving Systems of Equations by Elimination 108
Systems of Equations Word Problems 109
Test Preparation 110
Answers of Worksheets – Chapter 7 111
Chapter 8: Inequalities 113
Graphing Single–Variable Inequalities 114
One–Step Inequalities 115
Two–Step Inequalities 116
Multi–Step Inequalities 117
Test Preparation 118
Answers of Worksheets – Chapter 8 121
Chapter 9: Linear Functions 125
Finding Slope 126
Graphing Lines Using Slope–Intercept Form 127
Graphing Lines Using Standard Form 128
Writing Linear Equations 129
Graphing Linear Inequalities 130
Finding Midpoint 131
Finding Distance of Two Points 132
Slope and Rate of Change 133
Find the Slope, x–intercept and y–intercept 134
Write an Equation from a Graph 135
Slope–intercept Form 136
Point–slope Form 137
Equations of Horizontal and Vertical Lines 138
Equation of Parallel or Perpendicular Lines 139
Test Preparation 140
Answers of Worksheets – Chapter 9 142

Chapter 10: Monomials and Polynomials 150
Classifying Polynomials 151
Writing Polynomials in Standard Form 152
Simplifying Polynomials 153
Add and Subtract monomials 154
Multiplying Monomials 155
Multiplying and Dividing Monomials 156
GCF of Monomials 157
Powers of monomials 158
Multiplying a Polynomial and a Monomial 159
Multiplying Binomials 160
Factoring Trinomials 161
Test Preparation 162
Answers of Worksheets – Chapter 10 164
Chapter 11: Exponents and Radicals 170
Multiplication Property of Exponents 171
Division Property of Exponents 172
Powers of Products and Quotients 173
Zero and Negative Exponents 174
Negative Exponents and Negative Bases 175
Writing Scientific Notation 176
Square Roots 177
Test Preparation 178
Answers of Worksheets – Chapter 11 180
Chapter 12: Plane Figures 183
Transformations: Translations, Rotations, and Reflections 184
The Pythagorean Theorem 185
Area of Triangles 186
Perimeter of Polygons 187
Area and Circumference of Circles 188
Area of Squares, Rectangles, and Parallelograms 189
Area of Trapezoids 190

Test Preparation 191
Answers of Worksheets – Chapter 12 193
Chapter 13: Solid Figures 195
Volume of Cubes 196
Volume of Rectangle Prisms 197
Surface Area of Cubes 197
Surface Area of a Rectangle Prism 199
Volume of a Cylinder 200
Surface Area of a Cylinder 201
Test Preparation 202
Answers of Worksheets – Chapter 13 203
Chapter 14: Statistics and Probability 205
Mean, Median, Mode, and Range of the Given Data 206
The Pie Graph or Circle Graph 207
Probability of Simple Events 208
Factorials 209
Test Preparation 210
Answers of Worksheets – Chapter 14 212
SHSAT Test Review 215
SHSAT Mathematics Practice Tests 216
SHSAT Mathematics Practice Tests Answers and Explanations 264

Chapter 1: Fundamentals and Building Blocks

Topics that you'll learn in this chapter:

- ✓ Simplifying Fractions
- ✓ Adding and Subtracting Fractions
- ✓ Multiplying and Dividing Fractions
- ✓ Adding Mixed Numbers
- ✓ Subtract Mixed Numbers
- ✓ Multiplying Mixed Numbers
- ✓ Dividing Mixed Numbers
- ✓ Comparing Decimals
- ✓ Rounding Decimals
- ✓ Adding and Subtracting Decimals
- ✓ Multiplying and Dividing Decimals
- ✓ Converting Between Fractions, Decimals and Mixed Numbers
- ✓ Factoring Numbers
- ✓ Greatest Common Factor
- ✓ Least Common Multiple

Simplifying Fractions

Helpful Hints

– Evenly divide both the top and bottom of the fraction by 2, 3, 5, 7, ... etc.
– Continue until you can't go any further.

Example:

$\frac{4}{12} = \frac{2}{6} = \frac{1}{3}$

Simplify the fractions.

1) $\frac{22}{36}$

2) $\frac{8}{10}$

3) $\frac{12}{18}$

4) $\frac{6}{8}$

5) $\frac{13}{39}$

6) $\frac{5}{20}$

7) $\frac{16}{36}$

8) $\frac{18}{36}$

9) $\frac{20}{50}$

10) $\frac{6}{54}$

11) $\frac{45}{81}$

12) $\frac{21}{28}$

13) $\frac{35}{56}$

14) $\frac{52}{64}$

15) $\frac{13}{65}$

16) $\frac{44}{77}$

17) $\frac{21}{42}$

18) $\frac{15}{36}$

19) $\frac{9}{24}$

20) $\frac{20}{80}$

21) $\frac{25}{45}$

Adding and Subtracting Fractions

Helpful Hints

– For "like" fractions (fractions with the same denominator), add or subtract the numerators and write the answer over the common denominator.
– Find equivalent fractions with the same denominator before you can add or subtract fractions with different denominators.
– Adding and Subtracting with the same denominator:

$$\frac{a}{b}+\frac{c}{b}=\frac{a+c}{b}$$
$$\frac{a}{b}-\frac{c}{b}=\frac{a-c}{b}$$

– Adding and Subtracting fractions with different denominators:

$$\frac{a}{b}+\frac{c}{d}=\frac{ad+cb}{bd}$$
$$\frac{a}{b}-\frac{c}{d}=\frac{ad-cb}{bd}$$

Add fractions.

1) $\frac{2}{3}+\frac{1}{2}$
2) $\frac{3}{5}+\frac{1}{3}$
3) $\frac{5}{6}+\frac{1}{2}$
4) $\frac{7}{4}+\frac{5}{9}$
5) $\frac{2}{5}+\frac{1}{5}$
6) $\frac{3}{7}+\frac{1}{2}$
7) $\frac{3}{4}+\frac{2}{5}$
8) $\frac{2}{3}+\frac{1}{5}$
9) $\frac{16}{25}+\frac{3}{5}$

Subtract fractions.

10) $\frac{4}{5}-\frac{2}{5}$
11) $\frac{3}{5}-\frac{2}{7}$
12) $\frac{1}{2}-\frac{1}{3}$
13) $\frac{8}{9}-\frac{3}{5}$
14) $\frac{3}{7}-\frac{3}{14}$
15) $\frac{4}{15}-\frac{1}{10}$
16) $\frac{3}{4}-\frac{13}{18}$
17) $\frac{5}{8}-\frac{2}{5}$
18) $\frac{1}{2}-\frac{1}{9}$

Multiplying and Dividing Fractions

Helpful Hints

– **Multiplying fractions:** multiply the top numbers and multiply the bottom numbers.

– **Dividing fractions:** Keep, Change, Flip

Keep first fraction, change division sign to multiplication, and flip the numerator and denominator of the second fraction. Then, solve!

Example:

$$\frac{a}{b} \times \frac{c}{d} = \frac{a \times c}{b \times \mathrm{d}}$$

$$\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \times \frac{d}{c} = \frac{ad}{bc}$$

Multiplying fractions. Then simplify.

1) $\frac{1}{5} \times \frac{2}{3}$

2) $\frac{3}{4} \times \frac{2}{3}$

3) $\frac{2}{5} \times \frac{3}{7}$

4) $\frac{3}{8} \times \frac{1}{3}$

5) $\frac{3}{5} \times \frac{2}{5}$

6) $\frac{7}{9} \times \frac{1}{3}$

7) $\frac{2}{3} \times \frac{3}{8}$

8) $\frac{1}{4} \times \frac{1}{3}$

9) $\frac{5}{7} \times \frac{7}{12}$

Dividing fractions.

10) $\frac{2}{9} \div \frac{1}{4}$

11) $\frac{1}{2} \div \frac{1}{3}$

12) $\frac{6}{11} \div \frac{3}{4}$

13) $\frac{11}{14} \div \frac{1}{10}$

14) $\frac{3}{5} \div \frac{5}{9}$

15) $\frac{1}{2} \div \frac{1}{2}$

16) $\frac{3}{5} \div \frac{1}{5}$

17) $\frac{12}{21} \div \frac{3}{7}$

18) $\frac{5}{14} \div \frac{9}{10}$

Adding Mixed Numbers

Helpful Hints

Use the following steps for both adding and subtracting mixed numbers.

– Find the Least Common Denominator (LCD)
– Find the equivalent fractions for each mixed number.
– Add fractions after finding common denominator.
– Write your answer in lowest terms.

Example:

$1\frac{3}{4} + 2\frac{3}{8} = 4\frac{1}{8}$

Add.

1) $4\frac{1}{2} + 5\frac{1}{2}$

2) $2\frac{3}{8} + 3\frac{1}{8}$

3) $6\frac{1}{5} + 3\frac{2}{5}$

4) $1\frac{1}{3} + 2\frac{2}{3}$

5) $5\frac{1}{6} + 5\frac{1}{2}$

6) $3\frac{1}{3} + 1\frac{1}{3}$

7) $1\frac{10}{11} + 1\frac{1}{3}$

8) $2\frac{3}{6} + 1\frac{1}{2}$

9) $5\frac{3}{5} + 5\frac{1}{5}$

10) $7 + \frac{1}{5}$

11) $1\frac{5}{7} + \frac{1}{3}$

12) $2\ \frac{1}{4} + 1\frac{1}{2}$

Subtract Mixed Numbers

Helpful Hints

Use the following steps for both adding and subtracting mixed numbers.

Find the Least Common Denominator (LCD)
– Find the equivalent fractions for each mixed number.
– Add or subtract fractions after finding common denominator.
– Write your answer in lowest terms.

Example:

$5\frac{2}{3} - 3\frac{2}{7} = 2\frac{8}{21}$

Subtract.

1) $4\frac{1}{2} - 3\frac{1}{2}$

2) $3\frac{3}{8} - 3\frac{1}{8}$

3) $6\frac{3}{5} - 5\frac{1}{5}$

4) $2\frac{1}{3} - 1\frac{2}{3}$

5) $6\frac{1}{6} - 5\frac{1}{2}$

6) $3\frac{1}{3} - 1\frac{1}{3}$

7) $2\frac{10}{11} - 1\frac{1}{3}$

8) $2\frac{1}{2} - 1\frac{1}{2}$

9) $6\frac{3}{5} - 2\frac{1}{5}$

10) $7\frac{2}{5} - 1\frac{1}{5}$

11) $2\frac{5}{7} - 1\frac{1}{3}$

12) $2\frac{1}{4} - 1\frac{1}{2}$

Multiplying Mixed Numbers

Helpful Hints

1- Convert the mixed numbers to improper fractions.
2- Multiply fractions and simplify if necessary.

$$a\frac{c}{b} = a + \frac{c}{b} = \frac{ab+c}{b}$$

Example:

$$2\frac{1}{3} \times 5\frac{3}{7} =$$

$$\frac{7}{3} \times \frac{38}{7} = \frac{38}{3} = 12\frac{2}{3}$$

Find each product.

1) $1\frac{2}{3} \times 1\frac{1}{4}$

2) $1\frac{3}{5} \times 1\frac{2}{3}$

3) $1\frac{2}{3} \times 3\frac{2}{7}$

4) $4\frac{1}{8} \times 1\frac{2}{5}$

5) $2\frac{2}{5} \times 3\frac{1}{5}$

6) $1\frac{1}{3} \times 1\frac{2}{3}$

7) $1\frac{5}{8} \times 2\frac{1}{2}$

8) $3\frac{2}{5} \times 2\frac{1}{5}$

9) $2\frac{2}{3} \times 4\frac{1}{4}$

10) $2\frac{3}{5} \times 1\frac{2}{4}$

11) $1\frac{1}{3} \times 1\frac{1}{4}$

12) $3\frac{2}{5} \times 1\frac{1}{5}$

Dividing Mixed Numbers

Helpful Hints

1- Convert the mixed numbers to improper fractions.
2- Divide fractions and simplify if necessary.

$$a\frac{c}{b} = a + \frac{c}{b} = \frac{ab+c}{b}$$

Example:

$10\frac{1}{2} \div 5\frac{3}{5} =$

$\frac{21}{2} \div \frac{28}{5} = \frac{21}{2} \times \frac{5}{28} = \frac{105}{56}$

$= 1\frac{7}{8}$

Find each quotient.

1) $2\frac{1}{5} \div 2\frac{1}{2}$

2) $2\frac{3}{5} \div 1\frac{1}{3}$

3) $3\frac{1}{6} \div 4\frac{2}{3}$

4) $1\frac{2}{3} \div 3\frac{1}{3}$

5) $4\frac{1}{8} \div 2\frac{2}{4}$

6) $3\frac{1}{2} \div 2\frac{3}{5}$

7) $3\frac{5}{9} \div 1\frac{2}{5}$

8) $2\frac{2}{7} \div 1\frac{1}{2}$

9) $3\frac{1}{5} \div 1\frac{1}{2}$

10) $4\frac{3}{5} \div 2\frac{1}{3}$

11) $6\frac{1}{6} \div 1\frac{2}{3}$

12) $2\frac{2}{3} \div 1\frac{1}{3}$