TSI Mathematics Workbook 2018 - 2019

A Comprehensive Review and Step-by-Step Guide to Preparing for the TSI Math Test

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

TSI Mathematics Workbook 2018 - 2019

A Comprehensive Review and Step-By-Step Guide to Preparing for the TSI Math

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: 978-1720436294

ISBN-10: 1720436290

Published by: Effortless Math Education

www.EffortlessMath.com

Description

Effortless Math TSI Workbook 2018-2019 provides students with the confidence and math skills they need to succeed on the TSI Math, providing a solid foundation of basic Math topics with abundant exercises for each topic. It is designed to address the needs of TSI test takers who must have a working knowledge of basic Math.

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

There are more than 2,500 Math problems with answers in this book.

Effortless Math unique study program provides you with an in-depth focus on the math portion of the exam, helping you master the math skills that students find the most troublesome.

This workbook contains most common sample questions that are most likely to appear in the mathematics section of the TSI.

Inside the pages of this comprehensive Workbook, 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 TSI Math Practice Tests that reflect the format and question types on TSI

Effortless Math TSI Workbook is an incredibly useful tool for those who want to review all topics being covered on the TSI 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
– ACT Math in 30 Days.
– ASVAB 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: Fractions and Decimals 13

Simplifying Fractions 14

Adding and Subtracting Fractions 15

Multiplying and Dividing Fractions 16

Adding Mixed Numbers 17

Subtract Mixed Numbers 18

Multiplying Mixed Numbers 19

Dividing Mixed Numbers 20

Rounding Decimals 21

Adding and Subtracting Decimals 22

Multiplying and Dividing Decimals 23

Converting Between Fractions, Decimals and Mixed Numbers 24

Greatest Common Factor 25

Least Common Multiple 26

Answers of Worksheets – Chapter 1 27

Chapter 2: Real Numbers and Integers 32

Adding and Subtracting Integers 33

Multiplying and Dividing Integers 34

Ordering Integers and Numbers 35

Arrange, Order, and Comparing Integers 36

Order of Operations 37

Mixed Integer Computations 38

Integers and Absolute Value 39

Answers of Worksheets – Chapter 2 40

Chapter 3: Proportions and Ratios 43

Writing Ratios 44

Simplifying Ratios 45

Create a Proportion 46

Similar Figures 47

Simple Interest 48

Ratio and Rates Word Problems 49

Answers of Worksheets – Chapter 3 50
Chapter 4: Percent 52
Percentage Calculations 53
Converting Between Percent, Fractions, and Decimals 54
Percent Problems 55
Markup, Discount, and Tax 56
Answers of Worksheets – Chapter 4 57
Chapter 5: Algebraic Expressions 59
Expressions and Variables 60
Simplifying Variable Expressions 61
Simplifying Polynomial Expressions 62
Translate Phrases into an Algebraic Statement 63
The Distributive Property 64
Evaluating One Variable 65
Evaluating Two Variables 66
Combining like Terms 67
Answers of Worksheets – Chapter 5 68
Chapter 6: Equations 70
One–Step Equations 71
Two–Step Equations 72
Multi–Step Equations 73
Answers of Worksheets – Chapter 6 74
Chapter 7: Inequalities 75
Graphing Single–Variable Inequalities 76
One–Step Inequalities 77
Two–Step Inequalities 78
Multi–Step Inequalities 79
Answers of Worksheets – Chapter 7 80
Chapter 8: Linear Functions 82
Finding Slope 83
Graphing Lines Using Slope–Intercept Form 84
Graphing Lines Using Standard Form 85

Writing Linear Equations 86
Graphing Linear Inequalities 87
Finding Midpoint 88
Finding Distance of Two Points 89
Answers of Worksheets – Chapter 8 90
Chapter 9: Polynomials 94
Classifying Polynomials 95
Writing Polynomials in Standard Form 96
Simplifying Polynomials 97
Adding and Subtracting Polynomials 98
Multiplying Monomials 99
Multiplying and Dividing Monomials 100
Multiplying a Polynomial and a Monomial 101
Multiplying Binomials 102
Factoring Trinomials 103
Operations with Polynomials 104
Answers of Worksheets – Chapter 9 105
Chapter 10: Quadratic and System of Equations 109
Solve a Quadratic Equation 110
Solving Systems of Equations by Elimination 111
Systems of Equations Word Problems 112
Answers of Worksheets – Chapter 10 113
Chapter 11: Quadratic Functions 114
Graphing Quadratic Functions 115
Solving Quadratic Equations 116
Use the Quadratic Formula and the Discriminant 117
Solve Quadratic Inequalities 118
Answers of Worksheets – Chapter 11 119
Chapter 12: Complex numbers 122
Adding and Subtracting Complex Numbers 123
Multiplying and Dividing Complex Numbers 124
Graphing Complex Numbers 125

Rationalizing Imaginary Denominators 126
Answers of Worksheets – Chapter 12 127
Chapter 13: Exponents and Radicals 129
Multiplication Property of Exponents 130
Division Property of Exponents 131
Powers of Products and Quotients 132
Zero and Negative Exponents 133
Negative Exponents and Negative Bases 134
Writing Scientific Notation 135
Square Roots 136
Answers of Worksheets – Chapter 13 137
Chapter 14: Statistics 140
Mean, Median, Mode, and Range of the Given Data 141
Box and Whisker Plots 142
Bar Graph 143
Stem–And–Leaf Plot 144
The Pie Graph or Circle Graph 145
Scatter Plots 146
Probability Problems 147
Answers of Worksheets – Chapter 14 149
Chapter 15: Geometry 152
The Pythagorean Theorem 153
Area of Triangles 154
Perimeter of Polygons 155
Area and Circumference of Circles 156
Area of Squares, Rectangles, and Parallelograms 157
Area of Trapezoids 158
Answers of Worksheets – Chapter 15 159
Chapter 16: Solid Figures 160
Volume of Cubes 161
Volume of Rectangle Prisms 162
Surface Area of Cubes 163

Surface Area of a Rectangle Prism 164
Volume of a Cylinder 165
Surface Area of a Cylinder 166
Answers of Worksheets – Chapter 16 167
Chapter 17: Logarithms 168
Rewriting Logarithms 169
Evaluating Logarithms 170
Properties of Logarithms 171
Natural Logarithms 172
Solving Exponential Equations Requiring Logarithms 173
Solving Logarithmic Equations 174
Answers of Worksheets – Chapter 17 175
Chapter 18: Matrices 177
Adding and Subtracting Matrices 178
Matrix Multiplication 179
Finding Determinants of a Matrix 180
Finding Inverse of a Matrix 181
Matrix Equations 182
Answers of Worksheets – Chapter 18 183
Chapter 19: Functions Operations 186
Function Notation 187
Adding and Subtracting Functions 188
Multiplying and Dividing Functions 189
Composition of Functions 190
Answers of Worksheets – Chapter 19 191
Chapter 20: Trigonometric Functions 192
Trig ratios of General Angles 193
Sketch Each Angle in Standard Position 194
Finding Co-terminal Angles and Reference Angles 195
Writing Each Measure in Radians 196
Writing Each Measure in Degrees 197
Evaluating Each Trigonometric Function 198

Missing Sides and Angles of a Right Triangle 199
Arc Length and Sector Area 200
Answers of Worksheets – Chapter 20 201
Chapter 21: Sequences and Series 204
Arithmetic Sequences 205
Geometric Sequences 206
Comparing Arithmetic and Geometric Sequences 207
Finite Geometric Series 208
Infinite Geometric Series 209
Answers of Worksheets – Chapter 21 210
TSI Test Review 213
TSI Mathematics Practice Tests 215
TSI Mathematics Practice Test 1 216
TSI Mathematics Practice Test 2 226
TSI Math Practice Test 1 Answer Key 236
TSI Math Practice Test 2 Answer Key 237
TSI Mathematics Practice Test 1 Answers and Explanations 238
TSI Mathematics Practice Test 2 Answers and Explanations 242

Chapter 1: Fractions and Decimals

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
- ✓ 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

"A Man is like a fraction whose numerator is what he is and whose denominator is what he thinks of himself. The larger the denominator, the smaller the fraction." –Tolstoy

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