SAT Math Study Guide

Step-By-Step Guide to Preparing for the PSAT Math Test

2021 - 2022

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Reza Nazari

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By

Reza Nazari

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Welcome to
SAT Math Prep
2021

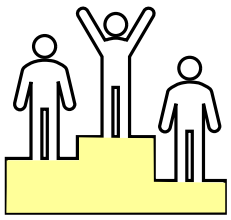


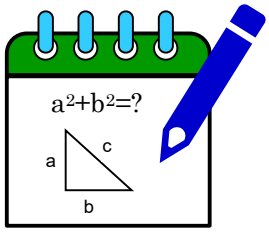


Thank you for choosing Effortless Math for your SAT Math test preparation and congratulations on making the decision to take the SAT test! It's a remarkable move you are taking, one that shouldn't be diminished in any capacity. That's why you need to use every tool possible to ensure you succeed on the test with the highest possible score, and this extensive study guide is one such tool.

This comprehensive book will help you prepare for (and even ACE) the SAT test's math section. As test day draws nearer, effective preparation becomes increasingly more important. Thankfully, you have this comprehensive study guide to help you get ready for the test. With this guide, you can feel confident that you will be more than ready for the SAT Math test when the time comes.

First and foremost, it is important to note that this book is a study guide and not a textbook. It is best read from cover to cover. Every lesson of this "self-guided math book" was carefully developed to ensure that you are making the most effective use of your time while preparing for the test. This up-to-date guide reflects the 2021 test guidelines and will put you on the right track to hone your math skills, overcome exam anxiety, and boost your confidence, so that you can have your best to succeed on the SAT Math test.





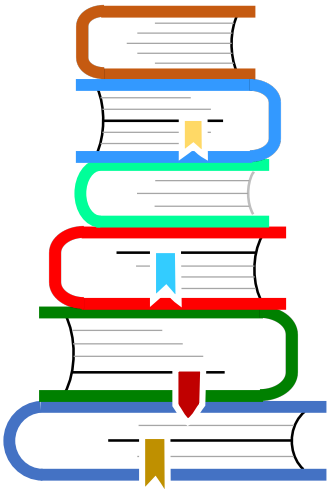
This study guide will:

- ☑ Explain the format of the SAT Math test.
- ☑ Describe specific test-taking strategies that you can use on the test.
- ☑ Provide SAT Math test-taking tips.
- ☑ Review all SAT Math concepts and topics you will be tested on.
- ☑ Help you identify the areas in which you need to concentrate your study time.
- ☑ Offer exercises that help you develop the basic math skills you will learn in each section.
- ☑ Give **2 realistic and full-length practice tests** (featuring new question types) with detailed answers to help you measure your exam readiness and build confidence.

This resource contains everything you will ever need to succeed on the SAT Math test. You'll get in-depth instructions on every math topic as well as tips and techniques on how to answer each question type. You'll also get plenty of practice questions to boost your test-taking confidence.

In addition, in the following pages you'll find:

- **How to Use This Book Effectively** – This section provides you with step-by-step instructions on how to get the most out of this comprehensive study guide.
- **How to study for the SAT Math Test** – A six-step study program has been developed to help you make the best use of this book and prepare for your SAT Math test. Here you'll find tips and strategies to guide your study program and help you understand SAT Math and how to ace the test.



- **SAT Math Review** – Learn everything you need to know about the SAT Math test.
- **SAT Math Test-Taking Strategies** – Learn how to effectively put these recommended test-taking techniques into use for improving your SAT Math score.
- **Test Day Tips** – Review these tips to make sure you will do your best when the big day comes.

Effortless Math's SAT Online Center

Effortless Math Online SAT Center offers a complete study program, including the following:

- ✓ Step-by-step instructions on how to prepare for the SAT Math test
- ✓ Numerous SAT Math worksheets to help you measure your math skills
- ✓ Complete list of SAT Math formulas
- ✓ Video lessons for all SAT Math topics
- ✓ Full-length SAT Math practice tests
- ✓ And much more…

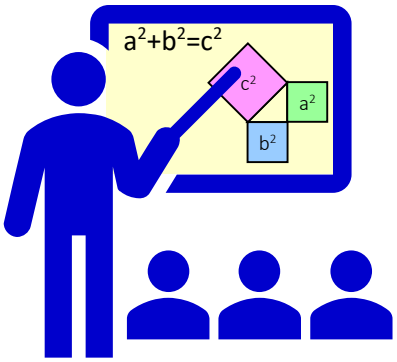
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Visit **EffortlessMath.com/SAT** to find your online SAT Math resources.

How to Use This Book Effectively

Look no further when you need a study guide to improve your math skills to succeed on the math portion of the SAT test. Each chapter of this comprehensive guide to the SAT Math will provide you with the knowledge, tools, and understanding needed for every topic covered on the test.

It's imperative that you understand each topic before moving onto another one, as that's the way to guarantee your success. Each chapter provides you with examples and a step-by-step guide of every concept to better understand the content that will be on the test. To get the best possible results from this book:



- **Begin studying long before your test date**. This provides you ample time to learn the different math concepts. The earlier you begin studying for the test, the sharper your skills will be. Do not procrastinate! Provide yourself with plenty of time to learn the concepts and feel comfortable that you understand them when your test date arrives.
- **Practice consistently**. Study SAT Math concepts at least 20 to 30 minutes a day. Remember, slow and steady wins the race, which can be applied to preparing for the SAT Math test. Instead of cramming to tackle everything at once, be patient and learn the math topics in short bursts.
- Whenever you get a math problem wrong, **mark it off, and review it later** to make sure you understand the concept.
- Start each session by **looking over the previous and related material.**
- Once you've reviewed the book's lessons, **take a practice test at the back of the book** to gauge your level of readiness. Then, review your results. Read detailed answers and solutions for each question you missed.
- **Take another practice test** to get an idea of how ready you are to take the actual exam. Taking the practice tests will give you the confidence you need on test day. Simulate the SAT testing environment by sitting in a quiet room free from distraction. Make sure to clock yourself with a timer.

Topic	Multiplying and Dividing Fractions	
Notes	✓ 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!	
Examples	***Multiply***. $\frac{2}{5} \times \frac{3}{4} =$ Multiply the top numbers and multiply the bottom numbers. $\frac{2}{5} \times \frac{3}{4} = \frac{2\times3}{5\times4} = \frac{6}{20}$, simplify: $\frac{6}{20} = \frac{6\div2}{20\div2} = \frac{3}{10}$ ***Divide***. $\frac{2}{5} \div \frac{3}{4} =$ Keep first fraction, change division sign to multiplication, and flip the numerator and denominator of the second fraction. Then: $\frac{2}{5} \div \frac{3}{4} = \frac{2}{5} \times \frac{4}{3} = \frac{2\times4}{5\times3} = \frac{8}{15}$	
Your Turn!	1) $\frac{3}{8} \times \frac{2}{5} =$	2) $\frac{4}{9} \div \frac{3}{4} =$
	3) $\frac{2}{7} \times \frac{3}{5} =$	4) $\frac{2}{5} \div \frac{7}{12} =$
	5) $\frac{1}{7} \times \frac{4}{9} =$	6) $\frac{2}{9} \div \frac{3}{7} =$
Find more at bit.ly/3haSiQW	7) $\frac{4}{7} \times \frac{3}{8} =$	8) $\frac{1}{6} \div \frac{3}{4} =$

Topic	Multiplying and Dividing Fractions - Answers	
Notes	✓ 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!	
Examples	***Multiply***. $\frac{2}{5}\times\frac{3}{4}=$ Multiply the top numbers and multiply the bottom numbers. $\frac{2}{5}\times\frac{3}{4}=\frac{2\times3}{5\times4}=\frac{6}{20}$, simplify: $\frac{6}{20}=\frac{6\div2}{20\div2}=\frac{3}{10}$ ***Divide***. $\frac{2}{5}\div\frac{3}{4}=$ Keep first fraction, change division sign to multiplication, and flip the numerator and denominator of the second fraction. Then: $\frac{2}{5}\div\frac{3}{4}=\frac{2}{5}\times\frac{4}{3}=\frac{2\times4}{5\times3}=\frac{8}{15}$	
Your Turn! **Find more at** bit.ly/3haSiQW	1) $\frac{3}{8}\times\frac{2}{5}=\frac{3}{20}$	2) $\frac{4}{9}\div\frac{3}{4}=\frac{16}{27}$
	3) $\frac{2}{7}\times\frac{3}{5}=\frac{6}{35}$	4) $\frac{2}{5}\div\frac{7}{12}=\frac{24}{35}$
	5) $\frac{1}{7}\times\frac{4}{9}=\frac{4}{63}$	6) $\frac{2}{9}\div\frac{3}{7}=\frac{14}{27}$
	7) $\frac{4}{7}\times\frac{3}{8}=\frac{3}{14}$	8) $\frac{1}{6}\div\frac{3}{4}=\frac{2}{9}$

Topic	Adding Mixed Numbers	
Notes	Use the following steps for adding mixed numbers. ✓ Add whole numbers of the mixed numbers. ✓ Add the fractions of each mixed number. ✓ Find the Least Common Denominator (LCD) if necessary. ✓ Add whole numbers and fractions. ✓ Write your answer in lowest terms.	
Example	***Add mixed numbers***. $1\frac{1}{2}+2\frac{2}{3}=$ Rewriting our equation with parts separated, $1+\frac{1}{2}+2+\frac{2}{3}$ Add whole numbers: $1+2=3$ Add fractions: $\frac{1}{2}+\frac{2}{3}=\frac{3}{6}+\frac{4}{6}=\frac{7}{6}=1\frac{1}{6}$, Now, combine the whole and fraction parts: $3+1+\frac{1}{6}=4\frac{1}{6}$	
Your Turn!	1) $2\frac{1}{15}+1\frac{2}{5}=$	2) $1\frac{3}{10}+3\frac{1}{5}=$
	3) $1\frac{1}{10}+2\frac{2}{5}=$	4) $2\frac{5}{6}+2\frac{2}{9}=$
	5) $2\frac{2}{7}+1\frac{2}{21}=$	6) $1\frac{3}{8}+3\frac{2}{3}=$
Find more at bit.ly/2M4oAB	7) $1\frac{1}{6}+4\frac{2}{7}=$	8) $2\frac{1}{6}+1\frac{2}{5}=$

Topic	Adding Mixed Numbers - Answers	
Notes	Use the following steps for adding mixed numbers. ✓ Add whole numbers of the mixed numbers. ✓ Add the fractions of each mixed number. ✓ Find the Least Common Denominator (LCD) if necessary. ✓ Add whole numbers and fractions. ✓ Write your answer in lowest terms.	
Example	***Add mixed numbers***. $1\frac{1}{2}+2\frac{2}{3}=$ Rewriting our equation with parts separated, $1+\frac{1}{2}+2+\frac{2}{3}$ Add whole numbers: $1+2=3$ Add fractions: $\frac{1}{2}+\frac{2}{3}=\frac{3}{6}+\frac{4}{6}=\frac{7}{6}=1\frac{1}{6}$ Now, combine the whole and fraction parts: $3+1+\frac{1}{6}=4\frac{1}{6}$	
Your Turn! **Find more at** bit.ly/2M4oABB	1) $2\frac{1}{15}+1\frac{2}{5}=3\frac{7}{15}$	2) $1\frac{3}{10}+3\frac{1}{5}=4\frac{1}{2}$
	3) $1\frac{1}{10}+2\frac{2}{5}=3\frac{1}{2}$	4) $2\frac{5}{6}+2\frac{2}{9}=5\frac{1}{18}$
	5) $2\frac{2}{7}+1\frac{2}{21}=3\frac{8}{21}$	6) $1\frac{3}{8}+3\frac{2}{3}=5\frac{1}{24}$
	7) $1\frac{1}{6}+4\frac{2}{7}=5\frac{19}{42}$	8) $2\frac{1}{6}+1\frac{2}{5}=3\frac{17}{30}$

Topic	Subtracting Mixed Numbers	
Notes	Use the following steps for subtracting mixed numbers. ✓ Convert mixed numbers into improper fractions. $a\frac{c}{b}=\frac{ab+c}{b}$ ✓ Find equivalent fractions with the same denominator for unlike fractions (fractions with different denominators) ✓ Subtract the second fraction from the first one. ✓ Write your answer in lowest terms and convert it into a mixed number if the answer is an improper fraction.	
Example	***Subtract***. $5\frac{1}{2}-2\frac{2}{3}=$ Convert mixed numbers into fractions: $5\frac{1}{2}=\frac{5\times2+1}{2}=\frac{11}{2}$ and $2\frac{2}{3}=\frac{2\times3+2}{3}=\frac{8}{3}$, these two fractions are "unlike" fractions. (they have different denominators). Find equivalent fractions with the same denominator. Use this formula: $\frac{a}{b}-\frac{c}{d}=\frac{ad-bc}{bd}$ $\frac{11}{2}-\frac{8}{3}=\frac{(11)(3)-(2)(8)}{2\times3}=\frac{33-16}{6}=\frac{17}{6}$, the answer is an improper fraction, convert it into a mixed number. $\frac{17}{6}=2\frac{5}{6}$	
Your Turn! **Find more at** bit.ly/3aD3KDG	1) $3\frac{1}{4}-1\frac{2}{3}=$	2) $4\frac{4}{9}-1\frac{1}{3}=$
	3) $6\frac{1}{4}-1\frac{2}{7}=$	4) $8\frac{2}{3}-1\frac{1}{4}=$
	5) $8\frac{3}{4}-1\frac{3}{8}=$	6) $2\frac{3}{8}-1\frac{2}{3}=$
	7) $8\frac{3}{5}-1\frac{2}{25}=$	8) $5\frac{2}{3}-2\frac{4}{7}=$

Topic	Subtracting Mixed Numbers - Answers	
Notes	Use the following steps for subtracting mixed numbers. ✓ Convert mixed numbers into improper fractions. $a\frac{c}{b}=\frac{ab+c}{b}$ ✓ Find equivalent fractions with the same denominator for unlike fractions (fractions with different denominators) ✓ Subtract the second fraction from the first one. ✓ Write your answer in lowest terms and convert it into a mixed number if the answer is an improper fraction.	
Example	***Subtract***. $5\frac{1}{2}-2\frac{2}{3}=$ Convert mixed numbers into fractions: $5\frac{1}{2}=\frac{5\times2+1}{2}=\frac{11}{2}$ and $2\frac{2}{3}=\frac{2\times3+2}{3}=\frac{8}{3}$, these two fractions are "unlike" fractions. (they have different denominators). Find equivalent fractions with the same denominator. Use this formula: $\frac{a}{b}-\frac{c}{d}=\frac{ad-bc}{bd}$ $\frac{11}{2}-\frac{8}{3}=\frac{(11)(3)-(2)(8)}{2\times3}=\frac{33-16}{6}=\frac{17}{6}$, the answer is an improper fraction, convert it into a mixed number. $\frac{17}{6}=2\frac{5}{6}$	
Your Turn! **Find more at** bit.ly/3aD3KDG	1) $3\frac{1}{4}-1\frac{2}{3}=1\frac{7}{12}$	2) $4\frac{4}{9}-1\frac{1}{3}=3\frac{1}{9}$
	3) $6\frac{1}{4}-1\frac{2}{7}=4\frac{27}{28}$	4) $8\frac{2}{3}-1\frac{1}{4}=7\frac{5}{12}$
	5) $8\frac{3}{4}-1\frac{3}{8}=7\frac{3}{8}$	6) $2\frac{3}{8}-1\frac{2}{3}=\frac{17}{24}$
	7) $8\frac{3}{5}-1\frac{2}{25}=7\frac{13}{25}$	8) $5\frac{2}{3}-2\frac{4}{7}=3\frac{2}{21}$

Topic	Multiplying Mixed Numbers
Notes	✓ Convert the mixed numbers into fractions. $a\frac{c}{b} = a + \frac{c}{b} = \frac{ab+c}{b}$ ✓ Multiply fractions and simplify if necessary. $\frac{a}{b} \times \frac{c}{d} = \frac{a \times c}{b \times d}$ ✓ If the answer is an improper fraction (numerator is bigger than denominator), convert it into a mixed number.
Example	***Multiply*** $2\frac{1}{4} \times 3\frac{1}{2}$ Convert mixed numbers into fractions: $2\frac{1}{4} = \frac{2\times4+1}{4} = \frac{9}{4}$ and $3\frac{1}{2} = \frac{3\times2+1}{2} = \frac{7}{2}$ Multiply two fractions: $\frac{9}{4} \times \frac{7}{2} = \frac{9\times7}{4\times2} = \frac{63}{8}$ The answer is an improper fraction. Convert it into a mixed number: $\frac{63}{8} = 7\frac{7}{8}$

Your Turn!		
	1) $3\frac{1}{3} \times 4\frac{1}{8} =$	2) $5\frac{1}{2} \times 2\frac{6}{7} =$
	3) $3\frac{1}{3} \times 3\frac{3}{4} =$	4) $2\frac{2}{9} \times 6\frac{1}{3} =$
	5) $2\frac{2}{7} \times 4\frac{3}{5} =$	6) $1\frac{4}{7} \times 9\frac{1}{2} =$
Find more at bit.ly/3aPy7XJ	7) $3\frac{3}{5} \times 4\frac{1}{3} =$	8) $5\frac{1}{4} \times 1\frac{1}{7} =$

Topic	Multiplying Mixed Numbers - Answers	
Notes	✓ Convert the mixed numbers into fractions. $a\frac{c}{b} = a + \frac{c}{b} = \frac{ab+c}{b}$ ✓ Multiply fractions and simplify if necessary. $\frac{a}{b} \times \frac{c}{d} = \frac{a \times c}{b \times d}$ ✓ If the answer is an improper fraction (numerator is bigger than denominator), convert it into a mixed number.	
Example	***Multiply*** $2\frac{1}{4} \times 3\frac{1}{2}$ Convert mixed numbers into fractions: $2\frac{1}{4} = \frac{2\times4+1}{4} = \frac{9}{4}$ and $3\frac{1}{2} = \frac{3\times2+1}{2} = \frac{7}{2}$ Multiply two fractions: $\frac{9}{4} \times \frac{7}{2} = \frac{9\times7}{4\times2} = \frac{63}{8}$ The answer is an improper fraction. Convert it into a mixed number: $\frac{63}{8} = 7\frac{7}{8}$	
Your Turn! **Find more at** bit.ly/3aPy7XJ	1) $3\frac{1}{3} \times 4\frac{1}{8} = 13\frac{3}{4}$	2) $5\frac{1}{2} \times 2\frac{6}{7} = 15\frac{5}{7}$
	3) $3\frac{1}{3} \times 3\frac{3}{4} = 12\frac{1}{2}$	4) $2\frac{2}{9} \times 6\frac{1}{3} = 14\frac{2}{27}$
	5) $2\frac{2}{7} \times 4\frac{3}{5} = 10\frac{18}{35}$	6) $1\frac{4}{7} \times 9\frac{1}{2} = 14\frac{13}{14}$
	7) $3\frac{3}{5} \times 4\frac{1}{3} = 15\frac{3}{5}$	8) $5\frac{1}{4} \times 1\frac{1}{7} = 6$

Topic	Dividing Mixed Numbers	
Notes	✓ Convert the mixed numbers into improper fractions. $a\frac{c}{b} = a + \frac{c}{b} = \frac{ab + c}{b}$ ✓ Divide fractions and simplify if necessary.	
Example	***Solve.*** $2\frac{1}{3} \div 1\frac{1}{4} =$ Converting mixed numbers to fractions: $2\frac{1}{3} \div 1\frac{1}{4} = \frac{7}{3} \div \frac{5}{4}$ Keep, Change, Flip: $\frac{7}{3} \div \frac{5}{4} = \frac{7}{3} \times \frac{4}{5} = \frac{7\times4}{3\times5} = \frac{28}{15} = 1\frac{13}{15}$	
Your Turn!	1) $2\frac{4}{7} \div 1\frac{1}{5} =$	2) $3\frac{3}{10} \div 2\frac{5}{8} =$
	3) $4\frac{2}{3} \div 3\frac{2}{5} =$	4) $5\frac{4}{5} \div 4\frac{3}{4} =$
	5) $1\frac{8}{9} \div 2\frac{3}{7} =$	6) $3\frac{3}{8} \div 2\frac{2}{5} =$
Find more at bit.ly/2KLPk9k	7) $4\frac{1}{5} \div 3\frac{1}{9} =$	8) $4\frac{2}{3} \div 1\frac{8}{9} =$
	9) $4\frac{1}{6} \div 3\frac{2}{3} =$	10) $6\frac{1}{3} \div 4\frac{1}{6} =$

Topic	Dividing Mixed Numbers- Answers	
Notes	✓ Convert the mixed numbers into improper fractions. $a\frac{c}{b} = a + \frac{c}{b} = \frac{ab + c}{b}$ ✓ Divide fractions and simplify if necessary.	
Example	***Solve***. $2\frac{1}{3} \div 1\frac{1}{4} =$ Converting mixed numbers to fractions: $2\frac{1}{3} \div 1\frac{1}{4} = \frac{7}{3} \div \frac{5}{4}$ Keep, Change, Flip: $\frac{7}{3} \div \frac{5}{4} = \frac{7}{3} \times \frac{4}{5} = \frac{7\times4}{3\times5} = \frac{28}{15} = 1\frac{13}{15}$	
Your Turn!	1) $2\frac{4}{7} \div 1\frac{1}{5} = 2\frac{1}{7}$	2) $3\frac{3}{10} \div 2\frac{5}{8} = 1\frac{9}{35}$
	3) $4\frac{2}{3} \div 3\frac{2}{5} = 1\frac{19}{51}$	4) $5\frac{4}{5} \div 4\frac{3}{4} = 1\frac{21}{95}$
	5) $1\frac{8}{9} \div 2\frac{3}{7} = \frac{7}{9}$	6) $3\frac{3}{8} \div 2\frac{2}{5} = 1\frac{13}{32}$
Find more at bit.ly/2KLPk9k	7) $4\frac{1}{5} \div 3\frac{1}{9} = 1\frac{7}{20}$	8) $4\frac{2}{3} \div 1\frac{8}{9} = 2\frac{8}{17}$
	9) $4\frac{1}{6} \div 3\frac{2}{3} = 1\frac{3}{22}$	10) $6\frac{1}{3} \div 4\frac{1}{6} = 1\frac{13}{25}$

Topic	Comparing Decimals	
Notes	Decimals: is a fraction written in a special form. For example, instead of writing $\frac{1}{2}$ you can write $\mathbf{0.5}$. For comparing decimals: ✓ Compare each digit of two decimals in the same place value. ✓ Start from left. Compare hundreds, tens, ones, tenth, hundredth, etc. ✓ To compare numbers, use these symbols: - Equal to $=$, Less than $<$, Greater than $>$ Greater than or equal $\geq$, Less than or equal $\leq$	
Examples	***Compare*** $\mathbf{0.40}$ ***and*** $\mathbf{0.04}$. 0.40 *is greater than* 0.04, because the tenth place of 0.40 is 4, but the tenth place of 0.04 is zero. Then: $0.40 > 0.04$ ***Compare*** $\mathbf{0.0912}$ ***and*** $\mathbf{0.912}$. 0.912 *is greater than* 0.0912, because the tenth place of 0.912 is 9, but the tenth place of 0.0912 is zero. Then: $0.0912 < 0.912$	
Your Turn!	1) $0.32 \square 0.36$	2) $1.68 \square 1.70$
	3) $19.1 \square 19.09$	4) $2.45 \square 2.089$
	5) $1.258 \square 12.58$	6) $0.89 \square 0.890$
Find more at bit.ly/2WHt2Za	7) $2.657 \square 3.568$	8) $0.368 \square 0.683$