Prepare for the SHSAT Math Test in 7 Days

2020

A Quick Study Guide with Two Full-Length SHSAT Math Practice Tests

Reza Nazari & Ava Ross

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By

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Description

Prepare for the SHSAT Math Test in 7 Days, which reflects the 2019 and 2020 test guidelines and topics, incorporates the best method and the right strategies to help you hone your math skills, overcome your exam anxiety, and boost your confidence -- and do your best to defeat SHSAT Math test quickly. This quick study guide contains only the most important and critical math concepts a student will need in order to succeed on the SHSAT Math test. Math concepts in this book break down the topics, so the material can be quickly grasped. Examples are worked step–by–step to help you learn exactly what to do.

This SHSAT Math new edition has been updated to duplicate questions appearing on the most recent SHSAT Math tests. It contains easy–to–read essential summaries that highlight the key areas of the SHSAT Math test. You only need to spend about 3 – 5 hours daily in your 7–day period in order to achieve your goal. After reviewing this book, you will have solid foundation and adequate practice that is necessary to fully prepare for the SHSAT Math.

Prepare for the SHSAT Math Test in 7 Days is for all SHSAT Math test takers. It is a breakthrough in Math learning — offering a winning formula and the most powerful methods for learning basic Math topics confidently. Each section offers step–by–step instruction and helpful hints, with a few topics being tackled each day.

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

- Content 100% aligned with the 2019-2020 SHSAT test
- Written by SHSAT Math tutors and test experts
- Complete coverage of all SHSAT Math concepts and topics which you will be tested
- Step-by-step guide for all SHSAT Math topics
- Dynamic design and easy-to-follow activities
- Over 600 additional SHSAT Math practice questions in both multiple-choice and grid-in formats with answers grouped by topic, so you can focus on your weak areas
- 2 full-length practice tests (featuring new question types) with detailed answers

Effortlessly and confidently follow the step–by–step instructions in this book to prepare for the SHSAT Math in a short period of time.

Prepare for the SHSAT Math Test in 7 Days is the only book you'll ever need to master Basic Math topics! It can be used as a self–study course – you do not need to work with a Math tutor. (It can also be used with a Math tutor).

Ideal for self–study as well as for classroom usage.

Answers

1) 7
2) -32
3) -20
4) 31
5) -14
6) 33
7) 56
8) -20
9) -55
10) 100
11) 48
12) -80
13) $-9, -6, -1, 3, 7$
14) $-11, -4, 5, 9, 12$
15) $-20, -19, -12, 18, 21$
16) $-25, -15, -7, 18, 32$
17) 23
18) 3
19) 46
20) -5
21) 32
22) 45
23) -8
24) -3
25) 36
26) 15
27) 16
28) 35
29) 3: 2
30) 1: 10
31) 1: 12
32) 1: 2
33) 3: 50
34) 1: 6
35) 35
36) 42
37) 45
38) 16
39) 27
40) 52
41) Yes
42) Yes
43) Yes
44) No
45) No
46) No
47) 50 feet
48) 6.25 meters

Day 3:
Percentage, Exponents, Variables and Roots

Math Topics that you'll learn today:

- ✓ Percentage Calculations
- ✓ Percent Problems
- ✓ Percent of Increase and Decrease
- ✓ Discount, Tax and Tip
- ✓ Simple Interest
- ✓ Multiplication Property of Exponents
- ✓ Division Property of Exponents
- ✓ Powers of Products and Quotients
- ✓ Zero and Negative Exponents
- ✓ Negative Exponents and Negative Bases
- ✓ Scientific Notation
- ✓ Square Roots

Mathematics is no more computation than typing is literature. ~ John Allen Paulos

Percentage Calculations

Step-by-step guide:

- ✓ Percent is a ratio of a number and 100. It always has the same denominator, 100. Percent symbol is %.
- ✓ Percent is another way to write decimals or fractions. For example:

$$40\% = 0.40 = \frac{40}{100} = \frac{2}{5}$$

- ✓ Use the following formula to find part, whole, or percent:

$$\text{part} = \frac{\text{percent}}{100} \times \text{whole}$$

Examples:

1) What is 10% of 45? Use the following formula: $\text{part} = \frac{\text{percent}}{100} \times \text{whole}$

$$\text{part} = \frac{10}{100} \times 45 \rightarrow \text{part} = \frac{1}{10} \times 45 \rightarrow \text{part} = \frac{45}{10} \rightarrow \text{part} = 4.5$$

2) What is 15% of 24? Use the percent formula: $\text{part} = \frac{\text{percent}}{100} \times \text{whole}$

$$\text{part} = \frac{15}{100} \times 24 \rightarrow \text{part} = \frac{360}{100} \rightarrow \text{part} = 3.6$$

Percent Problems

Step-by-step guide:

- ✓ In each percent problem, we are looking for the base, or part or the percent.
- ✓ Use the following equations to find each missing section.
  - Base = Part ÷ Percent
  - Part = Percent × Base
  - Percent = Part ÷ Base

Examples:

1) 1.2 is what percent of 24?

In this problem, we are looking for the percent. Use the following equation:

$$Percent = Part \div Ba \rightarrow Percent = 1.2 \div 24 = 0.05 = 5\%$$

2) 20 is 5% of what number?

Use the following formula: $Base = Part \div Percent \rightarrow Base = 20 \div 0.05 = 400$
20 is 5% of 400.

Percent of Increase and Decrease

Step-by-step guide:

To find the percentage of increase or decrease:

- ✓ New Number – Original Number
- ✓ The result ÷ Original Number × 100
- ✓ If your answer is a negative number, then this is a percentage decrease. If it is positive, then this is a percent of increase.

Examples:

1) Increased by 50%, the numbers 84 becomes:

   First find 50% of 84 $\rightarrow$ $\frac{50}{100} \times 84 = \frac{50 \times 84}{100} = 42$

   Then: $84 + 42 = 126$

2) The price of a shirt increases from $\$10$ to $\$14$. What is the percent increase?
   First: $14 - 10 = 4$
   4 is the result. Then: $4 \div 10 = \frac{4}{10} = 0.4 = 40\%$

Discount, Tax and Tip

Step-by-step guide:

- ✓ Discount = Multiply the regular price by the rate of discount
- ✓ Selling price = original price – discount
- ✓ Tax: To find tax, multiply the tax rate to the taxable amount (income, property value, etc.)
- ✓ To find tip, multiply the rate to the selling price.

Examples:

1) With an 10% discount, Ella was able to save $\$20$ on a dress. What was the original price of the dress?
   $10\%\ of\ x = 20, \frac{10}{100} \times x = 20, x = \frac{100 \times 2}{10} = 200$

2) Sophia purchased a sofa for $\$530.40$. The sofa is regularly priced at $\$624$. What was the percent discount Sophia received on the sofa?
Use this formula: $percent = Part \div base = 530.40 \div 624 = 0.85 = 85\%$
Therefore, the discount is: $100\% - 85\% = 15\%$

Simple Interest

Step-by-step guide:

- ✓ Simple Interest: The charge for borrowing money or the return for lending it.
  To solve a simple interest problem, use this formula:
  Interest = principal x rate x time ⇒ $\boldsymbol{I = p \times r \times t}$

Examples:

1) Find simple interest for $\$450$ investment at 7% for 8 years.
Use Interest formula: $I = prt$, $P = \$450$, $\mathrm{r} = 7\% = \frac{7}{100} = 0.07$ and $t = 8$
Then: $I = 450 \times 0.07 \times 8 = \$252$
2) Find simple interest for $\$5{,}200$ at 4% for 3 years.
Use Interest formula: $I = prt$, $P = \$5{,}200$, $\mathrm{r} = 4\% = \frac{4}{100} = 0.04$ and $t = 3$
Then: $I = 5{,}200 \times 0.04 \times 3 = \$624$

Multiplication Property of Exponents

Step-by-step guide:

- ✓ Exponents are shorthand for repeated multiplication of the same number by itself. For example, instead of 2×2, we can write 2^2. For $3 \times 3 \times 3 \times 3$, we can write 3^4
- ✓ In algebra, a variable is a letter used to stand for a number. The most common letters are: $x, y, z, a, b, c, m, and\ n$.
- ✓ Exponent's rules: $x^a \times x^b = x^{a+b}$, $\frac{x^a}{x^b} = x^{a-b}$

$$(x^a)^b = x^{a \times b}, \qquad (xy)^a = x^a \times y^a \text{ , } (\frac{a}{b})^c = \frac{a^c}{b^c}$$

Examples:

1) Multiply. $-2x^5 \times 7x^3 =$
   Use Exponent's rules: $x^a \times x^b = x^{a+b} \rightarrow x^5 \times x^3 = x^{5+3} = x^8$
   Then: $-2x^5 \times 7x^3 = -14x^8$
2) Multiply. $(x^2y^4)^3 =$
   Use Exponent's rules: $(x^a)^b = x^{a \times b}$. Then: $(x^2y^4)^3 = x^{2\times3}y^{4\times3} = x^6y^{12}$

Division Property of Exponents

Step-by-step guide:

- ✓ For division of exponents use these formulas: $\frac{x^a}{x^b} = x^{a-b}$, $x \neq 0$

$$\frac{x^a}{x^b} = \frac{1}{x^{b-a}}, x \neq 0, \qquad \frac{1}{x^b} = x^{-b}$$

Examples:

1) Simplify. $\frac{4x^3y}{36\ ^2y^3} =$
   First cancel the common factor: $4 \rightarrow \frac{4x^3y}{36x^2y^3} = \frac{x^3y}{9x^2y^3}$
   Use Exponent's rules: $\frac{x^a}{x^b} = x^{a-b} \rightarrow \frac{x^3}{x^2} = x^{3-2}$
   Then: $\frac{4x^3y}{36\ ^2y^3} = \frac{xy}{9y^3}$ → now cancel the common factor: $y \rightarrow \frac{xy}{9y^3} = \frac{x}{9y^2}$
2) Divide. $\frac{2x^{-5}}{9x^{-2}} =$
   Use Exponent's rules: $\frac{x^a}{x^b} = \frac{1}{x^{b-a}} \rightarrow \frac{x^{-5}}{x^{-2}} = \frac{1}{x^{-2-(-5)}} = \frac{1}{x^{-2+5}} = \frac{1}{x^3}$
   Then: $\frac{2x^{-5}}{9x^{-2}} = \frac{2}{9x^3}$