Prepare for the ACCUPLACER Next Generation Math Test in 7 Days

2019

A Quick Study Guide with Two Full-Length ACCUPLACER Next Generation Math Practice Tests

Reza Nazari & Ava Ross

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By

Reza Nazari & Ava Ross

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Description

Prepare for the ACCUPLACER Next Generation 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 ACCUPLACER 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 ACCUPLACER 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 ACCUPLACER Math new edition has been updated to duplicate questions appearing on the most recent ACCUPLACER Math tests. It contains easy–to–read essential summaries that highlight the key areas of the ACCUPLACER 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 ACCUPLACER Math.

Prepare for the ACCUPLACER Next Generation Math Test in 7 Days is for all ACCUPLACER 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 ACCUPLACER test
- Written by ACCUPLACER Math tutors and test experts
- Complete coverage of all ACCUPLACER Math concepts and topics which you will be tested
- Step-by-step guide for all ACCUPLACER Math topics
- Dynamic design and easy-to-follow activities
- Over 1,500 additional ACCUPLACER 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 ACCUPLACER Math in a short period of time.

Prepare for the ACCUPLACER Next Generation 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.

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
– GRE 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.

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Day 1: Integers, Ratios, and Proportions

Math Topics that you'll learn today:

- ✓ Adding and Subtracting Integers
- ✓ Multiplying and Dividing Integers
- ✓ Order of Operations
- ✓ Integers and Absolute Value
- ✓ Simplifying Ratios
- ✓ Proportional Ratios
- ✓ Similarity and Ratios

Without mathematics, there's nothing you can do. Everything around you is mathematics. Everything around you is numbers." - Shakuntala Devi

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:

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

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: $4 \div 10 = \frac{4}{10} = 0.4 = 40\%$

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 $\Rightarrow$ $\boldsymbol{I = p \times r \times t}$

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: $I = prt$, $P = \$5{,}200$, 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: $(x^2\ y^4)^3 = x^{2 \times 3}y^{4 \times 3} = x^6y^{12}$

Division Property of Exponents

Step-by-step guide:

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

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

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: $\frac{x^a}{x^b} = x^{\text{a–b}} \rightarrow \frac{x^3}{x^2} = x^{3-2}$

Then: $\frac{4x^3y}{36x^2y^3} = \frac{xy}{9y^3} \rightarrow$ 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: $\frac{2x^{-5}}{9x^{-2}} = \frac{2}{9x^3}$

Powers of Products and Quotients

Step-by-step guide:

- ✓ For any nonzero numbers a and b and any integer x, $(ab)^x = a^x \times \text{b}^x$.

Examples:

1) Simplify. $(3x^5y^4)^2 =$

Use Exponent's rules: $(x^a)^b = x^{a\times b}$

$(3x^5y^4)^2 = (3)^2(x^5)^2(y^4)^2 = 9x^{5\times2}y^{4\times2} = 9x^{10}y^8$

2) Simplify. $(\frac{2x}{3x^2})^2 =$ First cancel the common factor: $x \rightarrow (\frac{2x}{3x^2})^2 = (\frac{2}{3x})^2$

Use Exponent's rules: $(\frac{a}{b})^c = \frac{a^c}{b^c}$, Then: $(\frac{2}{3x})^2 = \frac{2^2}{(3x)^2} = \frac{4}{9x^2}$

Zero and Negative Exponents

Step-by-step guide:

- ✓ A negative exponent simply means that the base is on the wrong side of the fraction line, so you need to flip the base to the other side. For instance, "x^{-2}" (pronounced as "ecks to the minus two") just means "x^2" but underneath, as in $\frac{1}{x^2}$.

Examples:

1) Evaluate. $(\frac{4}{9})^{-2} =$

Use Exponent's rules: $\frac{1}{x^b} = x^{-b} \rightarrow (\frac{4}{9})^{-2} = \frac{1}{(\frac{4}{9})^2} = \frac{1}{\frac{4^2}{9^2}}$

Now use fraction rule: $\frac{1}{\frac{b}{c}} = \frac{c}{b} \rightarrow \frac{1}{\frac{4^2}{9^2}} = \frac{9^2}{4^2} = \frac{81}{16}$

2) Evaluate. $(\frac{5}{6})^{-3} =$

Use Exponent's rules: $\frac{1}{x^b} = x^{-b} \rightarrow (\frac{5}{6})^{-3} = \frac{1}{(\frac{5}{6})^3} = \frac{1}{\frac{5^3}{6^3}}$

Now use fraction rule: $\frac{1}{\frac{b}{c}} = \frac{c}{b} \rightarrow \frac{1}{\frac{5^3}{6^3}} = \frac{6^3}{5^3} = \frac{216}{125}$

Negative Exponents and Negative Bases

Step-by-step guide:

- ✓ Make the power positive. A negative exponent is the reciprocal of that number with a positive exponent.
- ✓ The parenthesis is important!
- ✓ $\mathbf{5^{-2}}$ is not the same as $\mathbf{(-5)^{-2}}$

$$(-5)^{-2} = -\frac{1}{5^2} \text{ and } (-5)^{-2} = +\frac{1}{5^2}$$

Examples:

1) Simplify. $(\frac{3a}{2c})^{-2} =$

Use Exponent's rules: $\frac{1}{x^b} = x^{-b} \rightarrow (\frac{3a}{2c})^{-2} = \frac{1}{(\frac{3a}{2c})^2} = \frac{1}{\frac{3^2a^2}{2^2c^2}}$

Now use fraction rule: $\frac{1}{\frac{b}{c}} = \frac{c}{b} \rightarrow \frac{1}{\frac{3^2a^2}{2^2c^2}} = \frac{2^2c^2}{3^2a^2}$

Then: $\frac{2^2c^2}{3^2a^2} = \frac{4c^2}{9a^2}$

2) Simplify. $(-\frac{5x}{3y})^{-3} =$

Use Exponent's rules: $\frac{1}{x^b} = x^{-b} \rightarrow (-\frac{5x}{3yz})^{-3} = \frac{1}{(-\frac{5x}{3y})^3} = \frac{1}{-\frac{5^3x^3}{3^3y^3z^3}}$

Now use fraction rule: $\frac{1}{\frac{b}{c}} = \frac{c}{b} \rightarrow \frac{1}{\frac{5^3x^3}{3^3y^3z^3}} = -\frac{3^3y^3z^3}{5^3x^3} = -\frac{27y^3z^3}{125x^3}$

Scientific Notation

Step-by-step guide:

- ✓ It is used to write very big or very small numbers in decimal form.
- ✓ In scientific notation all numbers are written in the form of:

$$m \times 10^n$$

Decimal notation	Scientific notation
5	5×10^0
$-25{,}000$	-2.5×10^4
0.5	5×10^{-1}
$2{,}122.456$	2.122456×10^3

Examples:

1) Write $\mathbf{0.000}$ in scientific notation.

First, move the decimal point to the right so that you have a number that is between 1 and 10. Then: $N = 1.2$

Second, determine how many places the decimal moved in step 1 by the power of 10.

Then: 10^{-4} → When the decimal moved to the right, the exponent is negative.

Then: $0.00012 = 1.2 \times 10^{-4}$

2) Write $\mathbf{8.3 \times 10^{-5}}$ in standard notation.

10^{-5} → When the decimal moved to the right, the exponent is negative.

Then: $8.3 \times 10^{-5} = 0.000083$