ATI TEAS 6 Math in 10 Days



The Most Effective ATI TEAS 6 Math Crash Course

Test Taker's #1 Choice

This Book Help

- ✓ Hone Your Math Skills
- ✓ Boost Your Confidence
- ✓ Overcome Your Exam Anxiety

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Reza Nazari

✓ Recommended by Test Prep Experts

ATI TEAS 6 Math in 10 Days!

The Most Effective ATI TEAS 6 Math Crash Course

By

Reza Nazari



About Effortless Math Education

Effortless Math Education operates the www.effortlessmath.com website, which prepares and publishes Test prep and Mathematics learning resources. Effortless Math authors' team strives to prepare and publish the best quality Mathematics learning resources to make learning Math easier for all. We Help Students Learn to Love Mathematics.

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ATI TEAS 6 MATH in 10 Days

The ultimate crash course to help you ace the ATI TEAS 6 Math test!

The perfect quick-review study guide for students of every level, ***ATI TEAS 6 Math in 10 Days*** is the top choice for ATI TEAS 6 Math test takers who want to make the most of their study time and earn a high score. Designed for the student who's running out of time, this book is the perfect last-minute solution that covers only the math concepts and topics tested on the exam, so you can save your valuable study time.

Written by a top TEAS 6 Math instructor and test prep expert, this quick study guide gives you the critical math concepts that will matter most on exam day. It relies on the author's extensive analysis of the test's structure and content. By following his advice, you can hone your math skills, overcome exam anxiety, and boost your score.

Here's why more teachers and test takers turn to this ATI TEAS 6 Math crash course:

- Content 100% aligned with the **2020 ATI TEAS 6 test**
- Written by a top ATI TEAS 6 Math instructor and test expert
- **Targeted Review** - study only what you need to know
- **Step-by-step guide** for all ATI TEAS 6 Math topics
- Abundant Math skills building exercises to help test-takers approach unfamiliar question types
- **2 full-length practice tests** (featuring new question types) with detailed answers
- And much more!

When it's crucial crunch time and your ATI TEAS 6 Math test is just around the corner, you only need ***ATI TEAS 6 Math in 10 Days***! Practice Your Way to Excellence.

Ideal for self-study and classroom usage!

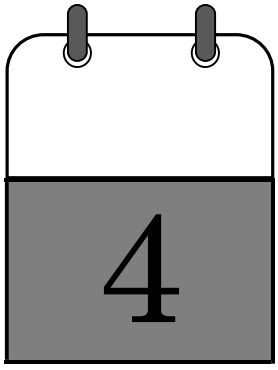
About the Author

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
- ACT Math in 30 Days
- ASVAB Math Workbook 2020
- 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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4 Exponents and Variables

Math topics that you'll learn in this chapter:



1. Multiplication Property of Exponents
2. Division Property of Exponents
3. Powers of Products and Quotients
4. Zero and Negative Exponents
5. Negative Exponents and Negative Bases
6. Scientific Notation
7. Radicals



Multiplication Property of Exponents

☆ 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: $x^a \times x^b = x^{a+b}$, $\frac{x^a}{x^b} = x^{a-b}$

$(x^a)^b = x^{a \times b}$ $\quad$ $(xy)^a = x^a \times y^a$ $\quad$ $\left(\frac{a}{b}\right)^c = \frac{a^c}{b^c}$

Examples:

Example 1. ***Multiply.*** $3x^2 \times 4x^3$

Solution: Use Exponent's rules: $x^a \times x^b = x^{a+b} \rightarrow x^2 \times x^3 = x^{2+3} = x^5$
Then: $3x^2 \times 4x^3 = 12x^5$

Example 2. ***Simplify.*** $(x^2y^4)^3$

Solution: Use Exponent's rules: $(x^a)^b = x^{a \times b}$.
Then: $(x^2y^4)^3 = x^{2\times3}y^{4\times3} = x^6y^{12}$

Example 3. ***Multiply.*** $6x^7 \times 4x^3$

Solution: Use Exponent's rules: $x^a \times x^b = x^{a+b} \rightarrow x^7 \times x^3 = x^{7+3} = x^{10}$
Then: $6x^7 \times 4x^3 = 24x^{10}$

Example 4. ***Simplify.*** $\left(x^2y^5\right)^4$

Solution: Use Exponent's rules: $(x^a)^b = x^{a \times b}$.
Then: $\left(x^2y^5\right)^4 = x^{2\times4}y^{5\times4} = x^8y^{20}$

Division Property of Exponents

For division of exponents use following formulas:

☆ $\frac{x^a}{x^b} = x^{a-b}$ $(x \neq 0)$

☆ $\frac{x^a}{x^b} = \frac{1}{x^{b-a}}$, $(x \neq 0)$

☆ $\frac{1}{x^b} = x^{-b}$

Examples:

Example 1. ***Simplify.*** $\frac{12x^2y}{3xy^3} =$

Solution: First, cancel the common factor: 3 → $\frac{12x^2y}{3xy^3} = \frac{4x^2y}{xy^3}$

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

Then: $\frac{12x^2y}{3xy^3} = \frac{4x}{y^2}$

Example 2. ***Simplify.*** $\frac{48x^{12}}{16x^9} =$

Solution: Use Exponent's rules: $\frac{x^a}{x^b} = x^{a-b} \rightarrow \frac{x^{12}}{x^9} = x^{12-9} = x^3$

Then: $\frac{48x^{12}}{16x^9} = 3x^3$

Example 3. ***Simplify.*** $\frac{6x^5y^7}{42x^8y^2} =$

Solution: First, cancel the common factor: 6 → $\frac{x^5y^7}{7x^8y^2}$

Use Exponent's rules: $\frac{x^a}{x^b} = x^{a-b} \rightarrow \frac{x^5}{x^8} = x^{5-8} = x^{-3} = \frac{1}{x^3}$ and $\frac{y^7}{y^2} = y^{7-2} = y^5$

Then: $\frac{6x^5y^7}{42x^8y^2} = \frac{y^5}{7x^3}$

Powers of Products and Quotients

☆ For any nonzero numbers a and b and any integer x, $(ab)^x = a^x \times b^x$ and $\left(\frac{a}{b}\right)^c = \frac{a^c}{b^c}$

Examples:

Example 1. Simplify. $\left(6x^4y^5\right)^2$

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

$\left(6x^4y^5\right)^2 = (6)^2(x^4)^2\left(y^5\right)^2 = 36x^{4\times2}y^{5\times2} = 36x^8y^{10}$

Example 2. Simplify. $\left(\frac{5x^5}{2x^4}\right)^2$

Solution: First, cancel the common factor: $x^4 \rightarrow \left(\frac{5x^5}{2x^4}\right) = \left(\frac{5x}{2}\right)^2$

Use Exponent's rules: $\left(\frac{a}{b}\right)^c = \frac{a^c}{b^c}$. Then: $\left(\frac{5x}{2}\right)^2 = \frac{(5x)^2}{(2)^2} = \frac{25x^2}{4}$

Example 3. Simplify. $(-6x^7y^3)^2$

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

$(-6x^7y^3)^2 = (-6)^2(x^7)^2(y^3)^2 = 36x^{7\times2}y^{3\times2} = 36x^{14}y^6$

Example 4. Simplify. $\left(\frac{8x^3}{5x^7}\right)^2$

Solution: First, cancel the common factor: $x^3 \rightarrow \left(\frac{8x^3}{5x^7}\right)^2 = \left(\frac{8}{5x^4}\right)^2$

Use Exponent's rules: $\left(\frac{a}{b}\right)^c = \frac{a^c}{b^c}$, Then: $\left(\frac{8}{5x^4}\right)^2 = \frac{8^2}{\left(5x^4\right)^2} = \frac{64}{25x^8}$

Zero and Negative Exponents

☆ Zero-Exponent Rule: $\boldsymbol{a^0 = 1}$, this means that anything raised to the zero power is 1. For example: $(5xy)^0 = 1$ (number zero is an exception: $\mathbf{0^0} = 0$)

☆ 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 $\frac{\mathbf{1}}{\boldsymbol{x^2}}$.

Examples:

Example 1. ***Evaluate.*** $\left(\frac{3}{7}\right)^{-2} =$

Solution: Use negative exponent's rule: $\left(\frac{x^a}{x^b}\right)^{-2} = \left(\frac{x^b}{x^a}\right)^2 \rightarrow \left(\frac{3}{7}\right)^{-2} = \left(\frac{7}{3}\right)^2$

Then: $\left(\frac{7}{3}\right)^2 = \frac{7^2}{3^2} = \frac{49}{9}$

Example 2. ***Evaluate.*** $\left(\frac{2}{5}\right)^{-3} =$

Solution: Use negative exponent's rule: $\left(\frac{x^a}{x^b}\right)^{-3} = \left(\frac{x^b}{x^a}\right)^3 \rightarrow \left(\frac{2}{5}\right)^{-3} = \left(\frac{5}{2}\right)^3 =$

Then: $\left(\frac{5}{2}\right)^3 = \frac{5^3}{2^3} = \frac{125}{8}$

Example 3. ***Evaluate.*** $\left(\frac{a}{b}\right)^0 =$

Solution: Use zero-exponent Rule: $\boldsymbol{a^0 = 1}$

Then: $\left(\frac{a}{b}\right)^0 = 1$

Example 4. ***Evaluate.*** $\left(\frac{9}{5}\right)^{-1} =$

Solution: Use negative exponent's rule: $\left(\frac{x^a}{x^b}\right)^{-1} = \left(\frac{x^b}{x^a}\right)^1 \rightarrow \left(\frac{9}{5}\right)^{-1} = \left(\frac{5}{9}\right)^1 = \frac{5}{9}$

Negative Exponents and Negative Bases

☆ A negative exponent is the reciprocal of that number with a positive exponent. $(3)^{-2} = \frac{1}{3^2}$

☆ To simplify a negative exponent, make the power positive!

☆ The parenthesis is important! -5^{-2} is not the same as $(-5)^{-2}$

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

Examples:

Example 1. ***Simplify.*** $\left(\frac{4a}{7c}\right)^{-2} =$

Solution: Use negative exponent's rule: $\left(\frac{x^a}{x^b}\right)^{-2} = \left(\frac{x^b}{x^a}\right)^2 \rightarrow \left(\frac{4a}{7c}\right)^{-2} = \left(\frac{7c}{4a}\right)^2$

Now use exponent's rule: $\left(\frac{a}{b}\right)^c = \frac{a^c}{b^c} \rightarrow \left(\frac{7c}{4a}\right)^2 = \frac{7^2c^2}{4^2a^2}$

Then: $\frac{7^2c^2}{4^2a^2} = \frac{49c^2}{16a^2}$

Example 2. ***Simplify.*** $\left(\frac{3x}{y}\right)^{-3} =$

Solution: Use negative exponent's rule: $\left(\frac{x^a}{x^b}\right)^{-3} = \left(\frac{x^b}{x^a}\right)^3 \rightarrow \left(\frac{3x}{y}\right)^{-3} = \left(\frac{y}{3x}\right)^3$

Now use exponent's rule: $\left(\frac{a}{b}\right)^c = \frac{a^c}{b^c} \rightarrow \left(\frac{y}{3x}\right)^3 = \frac{y^3}{3^3x^3} = \frac{y^3}{27x^3}$

Example 3. ***Simplify.*** $\left(\frac{7a}{4c}\right)^{-2} =$

Solution: Use negative exponent's rule: $\left(\frac{x^a}{x^b}\right)^{-2} = \left(\frac{x^b}{x^a}\right)^2 \rightarrow \left(\frac{7a}{4c}\right)^{-2} = \left(\frac{4c}{7a}\right)^2$

Now use exponent's rule: $\left(\frac{a}{b}\right)^c = \frac{a^c}{b^c} \rightarrow \left(\frac{4c}{7a}\right)^2 = \frac{4^2c^2}{7^2a^2}$

Then: $\frac{4^2c^2}{7^2a^2} = \frac{16c^2}{49a^2}$