50

GED MATH

Mathematical Reasoning

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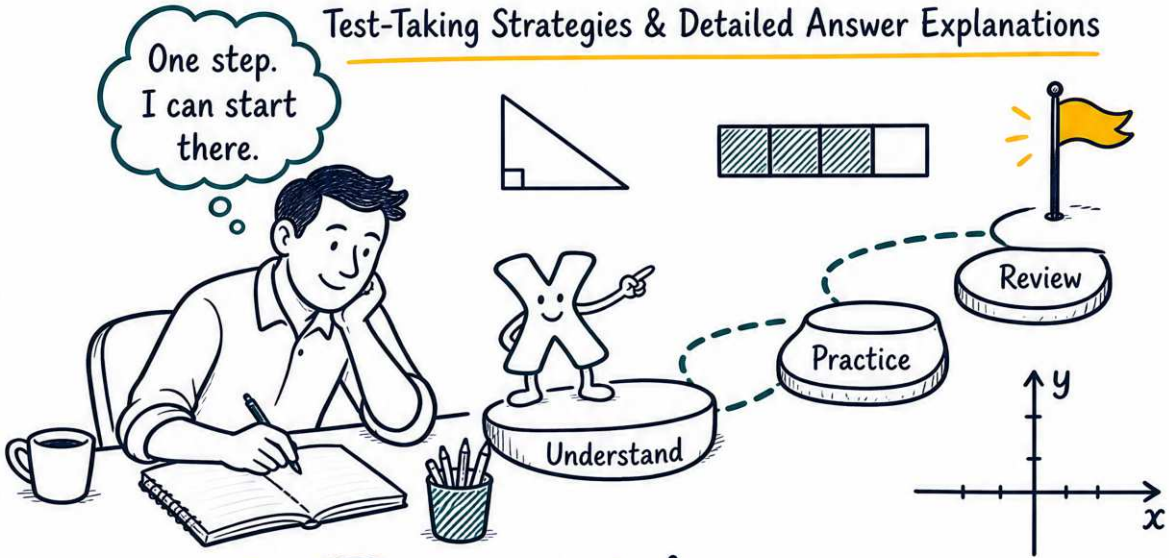
GED Mathematical Reasoning COMPLETE PREP

50 Full-Length Practice Tests

10 in this book + 40 online

Arithmetic • Algebra • Geometry • Data Analysis

Test-Taking Strategies & Detailed Answer Explanations



Reza Nazari

GED Mathematical Reasoning Complete Prep

50 Full-Length GED Mathematical Reasoning Practice Tests:
Arithmetic, Algebra, Geometry, Data Analysis, Test-Taking Strategies & Detailed Answer Explanations

Reza Nazari

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This edition includes ten printed practice forms and access to forty additional online forms. Questions, answer choices, explanations, and scenarios are independent practice material. Checkbox selections are print practice adaptations of interactive tasks. The 46-question count is the design of these practice forms. The publisher-defined 100–200 practice score and display bands are illustrative progress measures, not official GED scale scores or empirically validated predictions. This book does not reproduce GED testing software or claim psychometric equivalence to an operational GED form.

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PART I

Math Skill Lessons

Whether math is new to you or you are coming back after a long break, you can begin here. These lessons start with numbers you can picture, then build toward equations, graphs, and geometry. Take them one at a time.

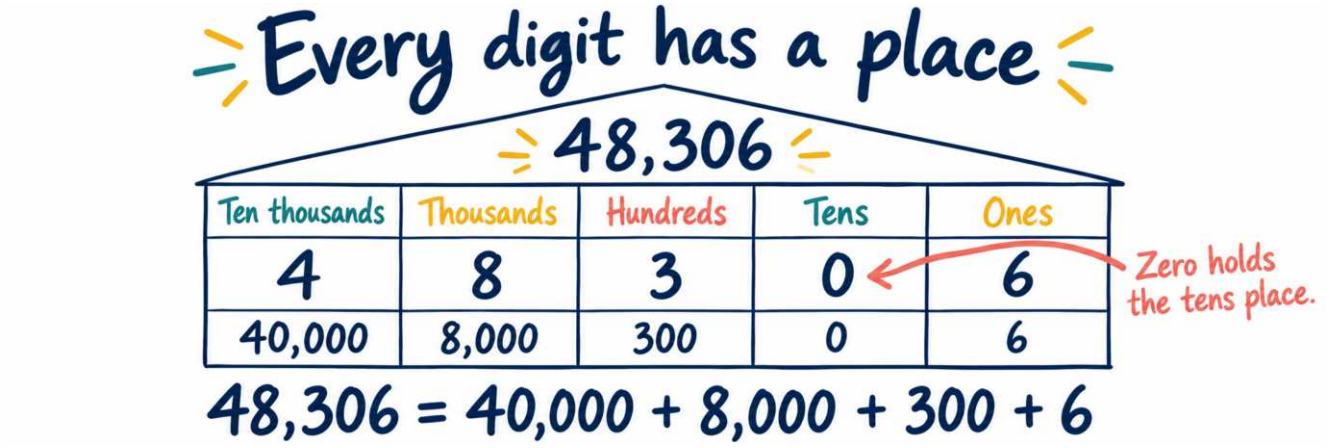
Keep a pencil nearby. Try each example, then follow the explanation if you need help. At the end of a lesson, practice with the answers covered. If you get stuck, find the step that confused you and try it again. You do not have to learn everything in one sitting.

We begin with number sense: understanding what numbers mean and choosing what to do with them.

1 Number sense, factors, and multiples

Read numbers and choose an operation

In 48,306, each digit has a different job. Read the number as forty-eight thousand, three hundred six. The 8 contributes eight thousand because it sits in the thousands place. The zero holds the tens place, keeping the other digits in their correct columns.



Each place to the left is worth ten times as much as the one beside it. To compare positive whole numbers, start with the number of digits. If the counts match, read from the left until you reach different digits. In 48,306 and 48,260, that happens in the hundreds place: 3 is greater than 2, so $48{,}306 > 48{,}260$.

Before choosing an operation, say what the numbers count. Use addition to **combine** amounts and subtraction to find an **amount left or a difference**. Multiplication counts **equal groups**. Division can share a total equally or count how many groups fit. Six cartons with eight notebooks in each contain 6×8 notebooks. Count those notebooks first, then add any extras on the shelf.

GED-Style Question

No-calculator practice

A warehouse packs 8 notebooks in each carton. It fills 6 cartons and keeps 5 additional notebooks on a shelf. How many notebooks are there altogether?

(A) 13 (B) 48

(C) 53 (D) 88

Each carton holds 8 notebooks, so the six cartons contain $6 \times 8 = 48$ notebooks. There are also five loose notebooks on the shelf. Add those once to get $48 + 5 = 53$, which is **choice C**. You can check the grouping by taking the five loose notebooks away again: the remaining 48 divide into six cartons of 8. The multiplication counts the notebooks inside the cartons, and the addition includes the ones outside them.

Regroup when a column needs it

Line up ones under ones, tens under tens, and hundreds under hundreds. In $268 + 157$, the ones give $8 + 7 = 15$: write 5 ones and carry 1 ten. The tens now give $6 + 5 + 1 = 12$: write 2 tens and carry 1 hundred. The hundreds give $2 + 1 + 1 = 4$, so the sum is 425. Carrying trades ten of one place for one of the next place.

Subtraction can require that trade in reverse. To find $402 - 178$, the ones column needs more than its 2 ones. Trade one hundred for ten tens, then trade one of those tens for ten ones. You now have 3 hundreds, 9 tens, and 12 ones. Subtract by column: $12 - 8 = 4$, $9 - 7 = 2$, and $3 - 1 = 2$. The answer is 224. Check by adding $224 + 178 = 402$.

For multiplication, break one factor into place values: $23(14) = 23(10) + 23(4) = 230 + 92 = 322$. A written multiplication method keeps those two partial products in their correct columns. The product by the tens digit belongs one place to the left because that digit represents 10, not 1.

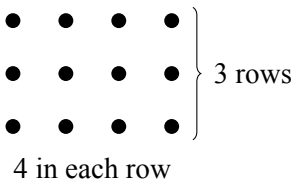
To divide 936 by 24, begin with 93 because 24 does not fit into 9. Three groups of 24 use 72, leaving $93 - 72 = 21$. Bring down the remaining digit 6 to make 216. Nine groups of 24 use exactly 216. The quotient is 39, and $39(24) = 936$ checks it. If division leaves a remainder, compare that remainder with the divisor: it must be smaller, or another whole group still fits.

Keep the order of a calculation clear

In $18 \div 3 + 2 \times 4$, calculate the division and multiplication first: $6 + 8 = 14$. Multiplication and division have equal priority, so work from left to right when they occur together. Addition and subtraction also have equal priority: $20 - 6 + 2 = 14 + 2 = 16$. Parentheses ask you to finish a group first, so $(18 \div 3 + 2) \times 4 = 8 \times 4 = 32$. A number beside parentheses means multiplication: $2(4) = 2 \times 4$. Lesson 3 adds powers and roots to this order.

Division sometimes leaves a remainder. With 26 pencils and boxes holding 12 each, two boxes hold 24 and leave 2 pencils unpacked. You need a third box to hold *all* the pencils. If the question instead asks for completely filled boxes, the answer is two. Read what must be counted before deciding what to do with a remainder.

Factors fit into a number and multiples grow from it



Twelve dots can form 3 rows of 4. Therefore 3 and 4 are **factors** of 12, and 12 is a **multiple** of both. The equation $3 \times 4 = 12$ connects these two ideas.

To find factors, pair whole numbers whose product is the target: 1×12, 2×6, 3×4. So 12 has factors 1, 2, 3, 4, 6, 12. To find positive multiples of 12, count groups of twelve: 12, 24, 36, 48, ... A factor fits into the number without a remainder. A multiple counts one or more whole groups of that number.

Scan Me

5 leaves it unchanged. If the retained digit is 9, carry into the next column: 9.96 rounded to the nearest tenth becomes 10.0. The final zero shows the requested tenth-place precision. For a negative value, round its distance from zero and restore the minus sign. Keep intermediate values unrounded unless directed otherwise.

GED-Style Question

No-calculator practice

A recipe needs $2\frac{1}{4}$ cups of flour. A cook has already added $\frac{5}{6}$ cup. How much more flour is needed?

(A) $1\frac{1}{12}$ cups

(B) $1\frac{5}{12}$ cups

(C) $1\frac{7}{12}$ cups

(D) $3\frac{1}{12}$ cups

The recipe calls for $2\frac{1}{4}$ cups, and $\frac{5}{6}$ cup is already in the bowl. Subtract the amount you have from the amount you need. Writing the mixed number as $\frac{9}{4}$ gives $\frac{9}{4} - \frac{5}{6}$. Both fractions can be expressed in twelfths: $\frac{27}{12} - \frac{10}{12} = \frac{17}{12}$. Since 12 twelfths make one whole cup, $\frac{17}{12} = 1\frac{5}{12}$ cups. You need to add that much flour, so choose **B**. Adding it to the flour already in the bowl restores the recipe total.

GED-Style Question

No-calculator practice

A bottle contains $1\frac{1}{2}$ liters of juice. Each serving is $\frac{3}{8}$ liter. How many full servings can be poured?

(A) 2

(B) 3

(C) 4

(D) 6

Each serving uses $\frac{3}{8}$ liter, so you need to find how many groups of that size fit into $1\frac{1}{2}$ liters. Write the available juice as $\frac{3}{2}$ liters and divide: $\frac{3}{2} \div \frac{3}{8} = \frac{3}{2} \times \frac{8}{3}$. The factors of 3 cancel, leaving $\frac{8}{2} = 4$. You can pour **four servings, choice C**. Check by multiplying the serving size by the count: $4 \times \frac{3}{8} = \frac{12}{8} = 1\frac{1}{2}$ liters. All of the juice is accounted for.

GED-Style Question

Calculator-permitted practice

A shopper buys three notebooks at \$4.85 each and one pen for \$1.40. What is the total cost before tax?

(A) \$6.25

(B) \$14.55

(C) \$15.95

(D) \$18.75

Start with the three notebooks, since each costs \$4.85. Together they cost $3(4.85) = 14.55$ dollars. The pen is a separate purchase, so add its \$1.40 price once: $14.55 + 1.40 = 15.95$. The total is **\$15.95, choice C**. As a quick estimate, three notebooks at about \$5 each plus a pen costing about \$1 gives a total near \$16. That makes the exact result reasonable.

Chapter Practice

Fractions, decimals, and rounding

Directions: Choose one answer for each multiple-choice question. For numeric-response questions, write your answer on separate paper.

1. Which fraction equals $\frac{18}{24}$?
A $\frac{2}{3}$ **B** $\frac{3}{4}$ **C** $\frac{4}{5}$ **D** $\frac{9}{8}$

2. Which list is in order from least to greatest?
A $0.7,\ \frac{2}{3},\ 0.65$ **B** $\frac{2}{3},\ 0.65,\ 0.7$
C $0.65,\ 0.7,\ \frac{2}{3}$ **D** $0.65,\ \frac{2}{3},\ 0.7$

3. A board is $\frac{5}{6}$ yard long. A $\frac{1}{4}$-yard piece is cut off. How much remains?
A $\frac{7}{12}$ yard **B** $\frac{1}{2}$ yard **C** $\frac{2}{3}$ yard **D** $\frac{13}{12}$ yards

4. Find $1\frac{3}{4} + 2\frac{2}{3}$.
A $3\frac{5}{12}$ **B** $4\frac{1}{7}$ **C** $4\frac{5}{12}$ **D** $4\frac{7}{12}$

5. A recipe uses $\frac{3}{4}$ cup of oats. What amount is needed for half the recipe?
A $\frac{1}{4}$ cup **B** $\frac{3}{8}$ cup **C** $\frac{5}{8}$ cup **D** $\frac{3}{2}$ cups

6. How many $\frac{3}{8}$-cup servings can be made from $2\frac{1}{4}$ cups of rice?
A 3 **B** 4 **C** 5 **D** 6

7. A customer buys 3 notebooks at \$2.85 each and a \$1.40 pen. Enter the total cost in dollars, before tax.

8. Which fraction is equivalent to 0.375?
A $\frac{3}{8}$ **B** $\frac{3}{5}$ **C** $\frac{37}{100}$ **D** $\frac{5}{8}$

9. Round 18.746 to the nearest hundredth.
A 18.70 **B** 18.74 **C** 18.75 **D** 18.80

10. A 4.8-meter cable is cut into 0.7-meter pieces. What is the greatest number of complete pieces?
A 5 **B** 6 **C** 7 **D** 8

11. A tank holds 60 liters when full. It is $\frac{2}{3}$ full. Then $\frac{1}{4}$ of the water in it is used. How many liters remain?

12. A student writes $\frac{1}{2}+\frac{1}{3}=\frac{2}{5}$. Which correction is valid?
A Add only the denominators.
B Use $\frac{1+1}{2(3)}=\frac{2}{6}$.
C Multiply the fractions instead.
D Rewrite in sixths, then add to get $\frac{5}{6}$.

13. A walker records distances of $\frac{7}{8}$ mile, 0.82 mile, and $\frac{5}{6}$ mile on three days. Which list puts the distances in order from least to greatest?
A $\frac{5}{6},\ 0.82,\ \frac{7}{8}$ **B** $0.82,\ \frac{5}{6},\ \frac{7}{8}$
C $0.82,\ \frac{7}{8},\ \frac{5}{6}$ **D** $\frac{7}{8},\ \frac{5}{6},\ 0.82$

14. A 5.5-meter rope has 1.25 meters removed. The remaining rope is cut into pieces that are 0.75 meter long. Which answer gives the greatest number of complete pieces and the length left over?
A 4 pieces; 1.25 meters **B** 5 pieces; 0.25 meter
C 5 pieces; 0.50 meter **D** 6 pieces; 0 meters

15. A baker has $1\frac{3}{4}$ cups of oats. One batch of muffins uses $\frac{2}{3}$ cup. How many cups of oats remain after the baker makes $2\frac{1}{4}$ batches?
A $\frac{1}{4}$ cup **B** $\frac{1}{2}$ cup **C** $\frac{7}{12}$ cup **D** $1\frac{1}{2}$ cups

16. Which number belongs between $\frac{1}{2}$ and $\frac{3}{4}$ on a number line?
A 0.4 **B** 0.8 **C** 0.65 **D** 0.25

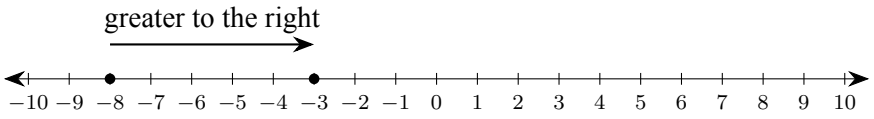
Make the fraction visible

For a fraction answer you missed, sketch equal-size pieces and label the whole. An addition needs matching pieces. A division asks how many groups fit. Check a quotient by multiplying it by the serving size: that should recover the starting amount.

3 Signed numbers, powers, and roots

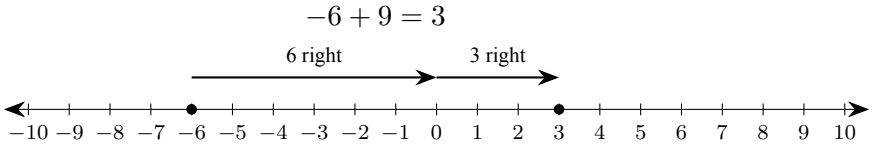
Signed numbers record direction

An **integer** is a whole-number value, its negative, or zero: $\ldots, -3, -2, -1, 0, 1, 2, 3, \ldots$. A negative value records a direction or a position relative to zero. A temperature below $0°$, a debt, and a level below sea level can use negative values.



Zero separates negative and positive values. Each tick is one unit. Moving right increases the value. Therefore $-3 > -8$: -3 is farther right even though 3 is less than 8. Zero is neither positive nor negative. Use their positions on the number line to compare signed numbers.

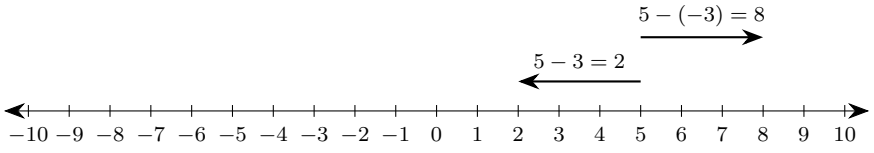
Addition is movement. Begin at the first number. For a positive amount, move right. For a negative amount, move left. For $-6 + 9$, six rightward steps reach 0 and three more reach 3. Crossing zero is allowed.



Numbers with matching signs move in the same direction: $-4 + (-3) = -7$. With different signs, their movements partly cancel. $-9 + 4 = -5$. For different signs, compare their distances from zero, called their **magnitudes**. In $-9 + 4$, subtract 4 from 9 and keep the minus sign because the leftward movement is larger. The result is -5.

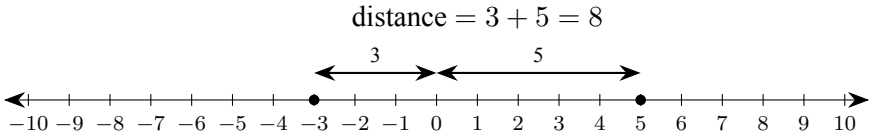
Subtract a signed number and measure a distance

Subtraction adds the opposite. Removing a positive change moves left. Removing a negative change moves right. The two calculations below start at 5 but move in opposite directions.



Write $5 - (-3) = 5 + 3 = 8$ before calculating. Two adjacent minus signs have different jobs: the first requests subtraction, and the second belongs to -3.

Absolute value is distance from zero, so it cannot be negative: $|-8| = 8$ and $|8| = 8$. Distance *between* positions also counts units, not signs.



From -3 to 5, travel 3 units to zero and 5 more to 5: the distance is 8. You can check with $|5 - (-3)| = 8$. The same distance rule works between fractions: $|-\frac{1}{4} - (-\frac{3}{4})| = |\frac{2}{4}| = \frac{1}{2}$. To compare fractions and decimals on the same line, convert to a common form first. A **rational number** can be written as a fraction of integers with a nonzero denominator. Whole numbers belong here too: $5 = \frac{5}{1}$. Fractions such as $-\frac{3}{4}$ and terminating or repeating decimals such as 0.25 and