

Virginia SOL Grade 7 Math Made Easy

Study Guide with Key Concepts, Review & Practice

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Math Made Easy

Key Concepts • Worked Examples • Review & Practice

This study guide breaks down every Grade 7 math topic into clear explanations, worked examples, and practice problems. Read the concept, follow the examples step by step, then test yourself. The answer key in the back lets you check your work and learn from every mistake.



9 Chapters

From ratios and percents to probability — every Grade 7 standard explained clearly.



Key Concepts First

Each topic starts with the core idea, so you always know what you're learning and why.



Worked Examples

Step-by-step solutions show you exactly how to solve each type of problem before you try on your own.



Practice with Answers

Every section ends with practice problems. Full answer key included in the back.

How to Use This Study Guide

Four steps to master every topic.

1

Read the Concept

Each topic opens with a clear explanation of the key idea or rule. Read it carefully — understanding why a method works is just as important as knowing how to use it.

2

Study the Examples

Worked examples walk through each problem type step by step. Follow along with pencil and paper. Try covering the solution and solving it yourself before you look.

3

Practice on Your Own

Every section ends with practice problems that mirror the examples. Write out all your steps — messy work is fine as long as your thinking is visible.

4

Check and Correct

Flip to the Answer Key and compare every answer. When you find a mistake, figure out where your reasoning went wrong. Then try a similar problem again. That's how real mastery happens.

Suggested Study Routine

- » **Weekdays:** Study one topic per day (about 20–30 minutes).
- » **End of week:** Review your notes and redo any problems you missed.
- » **Before a test:** Use the Math Quick Reference on the next page for a fast refresher.

 Pair It Up

This study guide covers the what and how. For extra drill, pair it with the Grade 7 Math Workbook — hundreds of additional practice problems organised by the same chapters and topics.

 For Parents & Teachers

- » *Encourage students to explain concepts in their own words.*
- » *Keep study sessions to 20–30 minutes for best focus.*
- » *Celebrate effort and progress, not just correct answers.*



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Math Quick Reference

Key formulas and facts for every chapter — bookmark this page!

Proportional Relationships

$$y = kx, \text{ where } k = \frac{y}{x}$$

The constant of proportionality k is the unit rate.

The graph is a straight line through the origin.

Inequalities

Solve like equations, but **flip the sign** when multiplying or dividing by a negative.

$$x > 3 \rightarrow \text{open circle at } 3$$

$$x \geq 3 \rightarrow \text{closed circle at } 3$$

Percent Problems

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

$$\text{Percent change: } \frac{|\text{new} - \text{original}|}{|\text{original}|} \times 100\%$$

$$\text{Simple interest: } I = Prt$$

Geometry & Scale

$$\text{Scale factor: } \frac{\text{drawing length}}{\text{actual length}}$$

$$\text{Supplementary: sum} = 180^\circ$$

$$\text{Complementary: sum} = 90^\circ$$

Vertical angles are equal.

Rational Number Rules

Same signs $\rightarrow$ add, keep the sign

Different signs $\rightarrow$ subtract, keep larger sign

Subtract = add the opposite

Multiply/Divide: same signs $\rightarrow +$, different $\rightarrow -$

Circles, Area & Volume

$$\text{Circumference: } C = 2\pi r = \pi d$$

$$\text{Area of circle: } A = \pi r^2$$

$$\text{Area of triangle: } A = \frac{1}{2}bh$$

$$\text{Volume of prism: } V = B \times h$$

Expressions & Equations

$$\text{Distributive Property: } a(b + c) = ab + ac$$

$$\text{Two-step equation: } ax + b = c$$

Solve: subtract b , then divide by a .

Probability & Statistics

$$P(\text{event}) = \frac{\text{favorable outcomes}}{\text{total outcomes}}$$

$$0 \leq P \leq 1$$

Compound events: use tree diagrams, tables, or organised lists to find the sample space.

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PREVIEW

CHAPTER

1

Ratios and Proportional Relationships

★ What's Inside ★

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★ 1.1 Unit Rates with Fractions ★

🎯 Learning Goals

- Compute unit rates when quantities are fractions
- Compare rates by finding unit rates

🎓 Unit Rates with Fractions

A **unit rate** tells you how much of one quantity per **one unit** of another. When the quantities are fractions, divide just like before:

$$\text{unit rate} = \frac{\text{first quantity}}{\text{second quantity}}$$

To divide fractions, **multiply by the reciprocal** (Keep–Change–Flip):

$$\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \times \frac{d}{c}$$

✏ Finding a Unit Rate

A recipe uses $\frac{3}{4}$ cup of sugar for $\frac{1}{2}$ batch. How much sugar per batch?

Solution:

$$\frac{3}{4} \div \frac{1}{2} = \frac{3}{4} \times \frac{2}{1} = \frac{6}{4} = \frac{3}{2}$$

✓ **Answer:** $1\frac{1}{2}$ cups per batch



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 Comparing Two Rates

Who walks faster?

• Ana: $\frac{2}{3}$ mi in $\frac{1}{4}$ hr

• Ben: $\frac{3}{4}$ mi in $\frac{1}{3}$ hr

Ana: $\frac{2}{3} \div \frac{1}{4} = \frac{8}{3} = 2\frac{2}{3}$ mph

Ben: $\frac{3}{4} \div \frac{1}{3} = \frac{9}{4} = 2\frac{1}{4}$ mph

$2\frac{2}{3} > 2\frac{1}{4}$ ☒ **Ana is faster.**



“Per” means “for every one.” To find a unit rate, always divide! ”

 Unit Rates with Fractions

1. A painter covers $\frac{2}{3}$ of a wall in $\frac{1}{3}$ hour. How much wall per hour?
2. A faucet leaks $\frac{1}{2}$ cup in $\frac{3}{4}$ minute. How many cups per minute?
3. A car uses $\frac{5}{6}$ gallon to travel $\frac{2}{3}$ mile. How many gallons per mile?
4. Trail mix A: $\frac{1}{2}$ cup nuts for $\frac{1}{4}$ cup raisins. Trail mix B: $\frac{2}{3}$ cup nuts for $\frac{1}{3}$ cup raisins. Which has more nuts per cup of raisins?
5. A snail crawls $\frac{5}{8}$ m in $\frac{3}{4}$ hr. A beetle crawls $\frac{7}{10}$ m in $\frac{4}{5}$ hr. Which is faster?



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CHAPTER

2

Operations with Rational Numbers

★ *What's Inside* ★

2.1 *Integers and Their Opposites* 5

★ 2.1 Integers and Their Opposites ★

🎯 Learning Goals

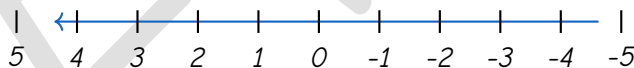
- Identify integers, opposites, and absolute values on a number line
- Compare and order rational numbers using inequality symbols

🎓 Integers, Opposites, and Absolute Value

Integers are whole numbers and their negatives: $\dots, -3, -2, -1, 0, 1, 2, 3, \dots$

Every integer has an **opposite** — the same distance from 0 on the other side.

- The opposite of 5 is -5 . The opposite of -3 is 3.
- A number plus its opposite always equals 0: $5 + (-5) = 0$.
- The **absolute value** $|n|$ is the distance from 0. It is always ≥ 0 .



✏ Comparing Rational Numbers in Multiple Forms

Order from least to greatest: $-1.5, \frac{3}{4}, -\frac{7}{4}, 0.2, -1$

Convert to decimals: $-1.5, 0.75, -1.75, 0.2, -1$.

On the number line, left to right: $-1.75 < -1.5 < -1 < 0.2 < 0.75$.

✓ **Answer:** $-\frac{7}{4}, -1.5, -1, 0.2, \frac{3}{4}$



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“ To compare fractions and decimals, convert them all to the same form. Decimals are usually easiest! ”



TIP

On a number line, numbers **increase** from left to right. So $-3 < -1$ because -3 is farther left.

Integers and Their Opposites

1. What is the opposite of -8 ? Place both -8 and its opposite on a number line.
2. Find $|-12|$ and $|7|$.
3. Use $<$, $>$, or $=$ to compare: $-\frac{2}{3}$ _____ -0.5
4. Order from least to greatest: $\frac{1}{2}$, -0.75 , $-\frac{1}{4}$, 0.3 , -1
5. $|-3| > |2|$

True ☐ False ☐



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THANK YOU

Enjoyed This Preview?

Get the Full Book!

This preview shows just a small sample of what's inside.

The complete book includes:

- ✓ *All chapters and topics*
- ✓ *Hundreds of practice problems*
- ✓ *Complete answer key with explanations*
- ✓ *Colorful visuals and step-by-step examples*
- ✓ *Reference sheets and progress trackers*

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