

# Illinois IAR Grade 6 Math Summer Workbook

*8-Week Skills Practice with Quick Reviews & Answers*

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**SUMMER PRACTICE**

# **Grade 6 Math Summer Review Workbook**

**Quick Review, Workbook Practice, Weekly Reviews, and Answers**

*This workbook keeps Grade 6 math fresh with short review lessons and plenty of practice. Each week builds from focused skills to a mixed Friday review, so students can remember, practice, and check their thinking.*

- ✓ Read the Quick Review.
- ✎ Work through the practice problems.
- ✓ Use Friday for mixed review.
- 💡 Study the answer explanations after trying first.

***A little math each week keeps skills strong.***



# **How to Use This Workbook**

*Use one short lesson at a time, then check and learn from mistakes.*

## **The Weekly Routine**

- Monday-Thursday** *Read the Quick Review, then complete the workbook practice for one topic.*
- Friday** *Complete the weekly mixed review to bring the week's skills together.*
- After practice** *Check answers and read the explanations for any problem that felt tricky.*

### **For students**

*Try the problems before looking at the answer key. If you miss a problem, read the explanation, fix your work, and mark it as a problem to try again later.*

### **For parents and teachers**

*The workbook pages are designed for steady practice. Use the Quick Review for a short reteach, and use the answer explanations as the teaching step after a mistake.*

### **Best practice habit**

*Show your thinking. Grade 6 math gets easier when you write the operation, draw a model, label units, use a graph, or explain how you know.*

### **Goal**

*By the end of 8 weeks, students will have reviewed the major Grade 6 skills with workbook-style practice and mixed weekly review.*

# What's Inside?

An 8-week workbook plan for Grade 6 summer math practice.

<b>Week 1</b>	Ratios, unit rates, ratio tables and graphs, and percents.
<b>Week 2</b>	Ratio applications, measurement conversions, fraction division, and decimal operations.
<b>Week 3</b>	Factors, multiples, signed numbers, rational numbers, and the coordinate plane.
<b>Week 4</b>	Rational-number comparisons, distance, exponents, order of operations, and expressions.
<b>Week 5</b>	Variables, equations, inequalities, and relationships between quantities.
<b>Week 6</b>	Area, volume, surface area foundations, and coordinate-plane geometry.
<b>Week 7</b>	Nets, surface area, statistical questions, center, and spread.
<b>Week 8</b>	Data displays, data comparisons, and final Grade 6 mixed review.

## Quick Reviews

Each topic begins with a compact review of the skill students need before starting the practice.

## Weekly Reviews

Friday pages mix the week's skills so students can practice choosing the right method.

## Workbook Practice

Practice sets include computation, word problems, tables, graphs, models, and short written reasoning.

## Answers

The answer key includes explanations that show how to think through the problem, not just the final answer.

**Read. Practice. Review. Correct. Grow.**

# My Summer Workbook Progress

Check off each lesson and write your Friday review score.

**This workbook belongs to:** \_\_\_\_\_

Week	Mon	Tue	Wed	Thu	Friday Review
1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	____ / ____
2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	____ / ____
3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	____ / ____
4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	____ / ____
5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	____ / ____
6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	____ / ____
7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	____ / ____
8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	____ / ____

## Reflection

One skill I improved this week: \_\_\_\_\_

One skill I want to practice again: \_\_\_\_\_

**Keep going. Finished pages are proof of progress.**

# Formula Reference Sheet

## Area Formulas

**Rectangle**  $A = l \times w$

**Parallelogram**  $A = b \times h$

**Triangle**  $A = \frac{1}{2} \times b \times h$

**Trapezoid**  $A = \frac{1}{2}(b_1 + b_2) \times h$

## Volume

**Rectangular Prism**  $V = l \times w \times h$

**Prism**

## Surface Area

Find the area of each face, then add them all up.

**Rectangular Prism:**

$$SA = 2lw + 2lh + 2wh$$

## Order of Operations

**P** Parentheses first

**E** Exponents

**M/D** Multiply & Divide (left to right)

**A/S** Add & Subtract (left to right)

## Ratios & Percents

**Ratio:**  $a : b$  or  $\frac{a}{b}$

**Unit rate:** amount per 1 unit

**Percent:** a ratio out of 100

$$\text{Part} = \text{Percent} \times \text{Whole}$$

## Integers & Absolute Value

**Integers:**

$\dots, -3, -2, -1, 0, 1, 2, 3, \dots$

$$|-5| = 5 \quad |5| = 5$$

**Absolute value** = distance from 0

## Expressions & Equations

**Exponent:**  $3^4 = 3 \times 3 \times 3 \times 3 = 81$

**Variable:** a letter that stands for a number

**Equation:** two expressions joined by =

**Inequality:** uses  $<$ ,  $>$ ,  $\leq$ ,  $\geq$

## Coordinate Plane

**Ordered pair:**  $(x, y)$

**x-axis:** horizontal    **y-axis:** vertical

**Origin:**  $(0, 0)$

**Four quadrants** (I, II, III, IV)

## Statistics

**Mean:** sum of values  $\div$  count

**Median:** middle value (sorted)

**Range:** max – min



# ★ *Table of Contents* ★

*Your 8-week summer review plan*

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***A little review each day keeps math fresh!***



# WEEK

1

## *Ratios, Rates, and Percents*

### *This Week's Days*

*Week 1 Day 1: What Is a Ratio?*

*Week 1 Day 2: Rates and Unit Rates*

*Week 1 Day 5: Week 1 Mixed Review*



## Day 1 What Is a Ratio?

### SKILL SNAPSHOT

A **ratio** compares two quantities. The order matters because the first number matches the first quantity named.

Words	Colon	Fraction
5 to 3	5:3	$\frac{5}{3}$

- ✓ A **part-to-part** ratio compares one part of a group to another part.
- ✓ A **part-to-whole** ratio compares one part to the total group.
- ✓ For a part-to-whole ratio, add all parts first to find the whole.
- ✓ Ratios can be written with words, a colon, or a fraction bar.
- ✓ Phrases such as “for every” and “for each” describe ratio relationships.

**Remember:** Check the order every time: dogs to cats is not the same comparison as cats to dogs.

### Write and read ratio forms.

- 1 A bag has 8 blue tiles and 5 green tiles. Write the ratio of blue tiles to green tiles in three forms. \_\_\_\_\_
- 2 A tray has 6 carrots and 9 celery sticks. Write the ratio of celery sticks to carrots. \_\_\_\_\_
- 3 The ratio of wins to losses is 11:4. Write this ratio in words. \_\_\_\_\_
- 4 A recipe uses 3 cups of rice for every 2 cups of beans. Write the ratio of beans to rice. \_\_\_\_\_

### Part-to-part or part-to-whole.

- 5 Use the table.

Shirt color	Students
Red	7
Blue	9
White	4

Write the ratio of red shirts to blue shirts. \_\_\_\_\_

- 6 Using the same table, write the ratio of white shirts to total students. \_\_\_\_\_



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## Day 2 Rates and Unit Rates

### SKILL SNAPSHOT

A **rate** is a ratio that compares quantities with different units. A **unit rate** tells how much there is for 1 unit.

$$\frac{150 \text{ miles}}{3 \text{ hours}} = \frac{50 \text{ miles}}{1 \text{ hour}} = 50 \text{ miles per hour}$$

- ✓ The word **per** means “for each one.”
- ✓ To find a unit rate, divide the total amount by the number of units.
- ✓ Unit rates can compare speeds, prices, earnings, and production.
- ✓ When comparing prices, the lower cost per item is the better buy.
- ✓ Always include units so the answer has meaning.

**Remember:** Ask: What amount would match exactly 1 of the second unit?

### Find unit rates.

- 1 A runner travels 18 miles in 3 hours. What is the unit rate? \_\_\_\_\_
- 2 A printer prints 240 pages in 6 minutes. How many pages per minute is that?  
\_\_\_\_\_
- 3 Mia earns \$56 for 7 hours of work. What is her hourly rate? \_\_\_\_\_
- 4 A faucet fills 12 gallons in 4 minutes. What is the rate in gallons per minute?  
\_\_\_\_\_

### Use tables and graphs.

- 5 Complete the table for a constant speed.

Hours	Miles
2	90
1	_____
5	_____

- 6 Use the graph. What is the unit rate in dollars per ticket?



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- 7 A table shows 3 notebooks cost \$7.50. Complete the unit price: 1 notebook costs \_\_\_\_\_.
- 8 True or False: If 5 pounds of apples cost \$12.50, the unit price is \$2.25 per pound.  True  False

**Compare unit rates.**

- 9 Which is the better buy: 4 markers for \$3.20 or 6 markers for \$4.50?  
\_\_\_\_\_
- 10 Store A sells 8 cans for \$6.40. Store B sells 10 cans for \$8.50. Which store has the lower price per can? \_\_\_\_\_
- 11 Which speed is faster: 132 miles in 3 hours or 200 miles in 5 hours?  
\_\_\_\_\_
- 12 A machine bottles 540 drinks in 9 minutes. At that rate, how many drinks are bottled in 15 minutes? \_\_\_\_\_

**Solve rate problems.**

- 13 A car uses 12 gallons of gas to travel 360 miles. How many miles per gallon is that?  
\_\_\_\_\_
- 14 A baker makes 96 muffins in 4 batches. How many muffins are in 7 batches at the same rate?  
\_\_\_\_\_
- 15 Which statement matches a unit rate of 15 pages per hour?
  - A. 15 pages in 2 hours
  - B. 45 pages in 3 hours
  - C. 30 pages in 1 hour
  - D. 60 pages in 5 hours

## Day 5 Week 1 Mixed Review

### WEEKLY SKILL CHECK

This review brings together Week 1 skills: ratios, rates, ratio tables and graphs, and percents.

- ✓ Keep ratio order tied to the words in the problem.
- ✓ Divide to find unit rates such as miles per hour or dollars per item.
- ✓ Ratio tables and graphs show equivalent pairs with the same unit rate.
- ✓ Percent means per 100; convert among fractions, decimals, and percents as needed.
- ✓ For word problems, decide whether the question asks for a part-to-part ratio, a part-to-whole ratio, a rate, or a percent.

**Remember:** On mixed review, write a small label for each number before choosing an operation.

### ☰ Ratios and ratio language.

- 1 A music group has 14 singers and 6 guitar players. Write the ratio of singers to guitar players in simplest form. \_\_\_\_\_
- 2 In the same music group, write the ratio of guitar players to total musicians. \_\_\_\_\_
- 3 True or False: A ratio of 9:5 is the same comparison as 5:9.  True  False

### ☰ Rates and unit rates.

- 4 A train travels 210 miles in 3 hours. What is the unit rate? \_\_\_\_\_
- 5 Which comparison is a rate?
  - A. 5 red blocks to 8 blue blocks
  - B. 12 dollars for 4 pounds
  - C. 7 girls to 6 boys
  - D. 3 pens to 9 pencils
- 6 Which is the better buy: 5 folders for \$3.75 or 8 folders for \$5.20?  
\_\_\_\_\_

### ☰ Ratio tables and graphs.

- 7 Complete the table for the ratio 3:8.

$x$	3	9	_____
$y$	8	_____	40



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- 8 A graph of equivalent ratios includes (2, 18) and (5, 45). What is the unit rate? \_\_\_\_\_
- 9 Use the graph. Does (4, 28) fit the line? \_\_\_\_\_



### ☰ Percents.

- 10 Write 0.36 as a percent. \_\_\_\_\_
- 11 Write  $\frac{7}{10}$  as a percent. \_\_\_\_\_
- 12 What is 15% of 200? \_\_\_\_\_
- 13 27 is what percent of 90? \_\_\_\_\_

### ☰ Mixed applications.

- 14 A punch recipe uses pineapple juice and water in a ratio of 2:5. If the recipe uses 20 cups of water, how many cups of pineapple juice are needed? \_\_\_\_\_
- 15 A class has 32 students. If 75% finished a project, how many students finished? \_\_\_\_\_
- 16 Which statement has the greatest unit rate?
- A. 48 words in 4 minutes
- B. 63 words in 7 minutes
- C. 70 words in 7 minutes
- D. 90 words in 10 minutes



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## ANSWER KEY

# Answer Key & Explanations

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*Use the answers to check your work, then read the explanations to learn the method.*

### ✔ **How to review**

*First compare your final answer. If it does not match, read the explanation slowly and redo the problem beside it. The goal is to understand the move that gets you from the question to the final answer.*

 **Week 1 Day 1: What Is a Ratio?**
 **Answers**

- 1 8 to 5, 8:5,  $\frac{8}{5}$     2 9:6    3 11 wins to 4 losses    4 2:3    5 7:9    6 4:20, or 1:5  
 7 Part-to-part    8 6:16, or 3:8    9 False    10 For every 2 teachers, there are 25 students.  
 11 9 squares    12 24 points    13 5:3    14 A    15 6:15, or 2:5

 **Explanations**

- 1 The first quantity named is blue tiles, so 8 comes first. The same ratio can be written in words, with a colon, or with a fraction bar.
- 2 The question asks for celery first, so use 9 as the first term. Carrots are second, so 6 is the second term.
- 3 The first number in the ratio matches wins, and the second number matches losses. Reading the ratio with units keeps the comparison clear.
- 4 The phrase asks for beans first, not rice first. Beans are 2 cups and rice is 3 cups, so the ratio is 2:3.
- 5 Red shirts and blue shirts are two parts of the group, so this is a part-to-part ratio. Red is named first, so 7 comes before 9.
- 6 This is part-to-whole because white shirts are compared with all students. The total is  $7+9+4 = 20$ , so the ratio is 4:20, which simplifies to 1:5.
- 7 Both grapes and strawberries are parts of the same bowl of fruit. A part-to-whole ratio would compare one fruit to the total number of fruits.
- 8 Bench players are being compared to all players, so add  $10 + 6 = 16$  for the whole. The ratio 6:16 simplifies by dividing both terms by 2 to get 3:8.
- 9 Ratio order matters. The ratio 4:7 compares 4 of the first quantity to 7 of the second, while 7:4 reverses the quantities.
- 10 The words should keep the same order as the ratio. Teachers are first and students are second, so the sentence describes 2 teachers for every 25 students.



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- 11 The circles changed from 5 to 15, which is multiplying by 3. Multiply the squares by the same factor:  $3 \times 3 = 9$ .
- 12 The ratio gives 6 points for each 1 token. For 4 tokens, multiply  $6 \times 4 = 24$  points.
- 13 Count the first quantity named, stars, before the second quantity, circles. There are 5 stars and 3 circles, so the ratio is 5:3.
- 14 Start with 12:18 because pencils are named first. Divide both terms by 6 to simplify the ratio to 2:3.
- 15 Add all pieces to find the whole:  $4 + 6 + 5 = 15$ . Crackers are 6 of the 15 pieces, and 6:15 simplifies to 2:5.

### 📅 Week 1 Day 2: Rates and Unit Rates

#### ✔ Answers

- 1 6 miles per hour    2 40 pages per minute    3 \$8 per hour    4 3 gallons per minute
- 5 45; 225    6 \$8 per ticket    7 \$2.50    8 False    9 6 markers for \$4.50    10 Store A
- 11 132 miles in 3 hours    12 900 drinks    13 30 miles per gallon    14 168 muffins    15 B

#### 💡 Explanations

- 1 A unit rate gives the distance for 1 hour. Divide 18 miles by 3 hours to get 6 miles per hour.
- 2 The phrase per minute means for 1 minute. Divide 240 pages by 6 minutes to get 40 pages each minute.
- 3 An hourly rate is dollars for 1 hour. Divide \$56 by 7 hours to get \$8 per hour.
- 4 Divide the total gallons by the number of minutes.  $12 \div 4 = 3$ , so the faucet fills 3 gallons each minute.
- 5 First find the unit rate:  $90 \div 2 = 45$  miles per hour. For 5 hours, multiply  $45 \times 5 = 225$  miles.



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- 6 Read a point on the graph, such as (2, 16). Divide dollars by tickets:  $16 \div 2 = 8$ , so each ticket costs \$8.
- 7 A unit price is the cost for one item. Divide \$7.50 by 3 notebooks to get \$2.50 per notebook.
- 8 Find the unit price by dividing \$12.50 by 5. The result is \$2.50 per pound, not \$2.25.
- 9 Find both unit prices.  $\$3.20 \div 4 = \$0.80$  per marker, and  $\$4.50 \div 6 = \$0.75$  per marker, so the 6-marker pack is cheaper.
- 10 Store A costs  $\$6.40 \div 8 = \$0.80$  per can. Store B costs  $\$8.50 \div 10 = \$0.85$  per can, so Store A is lower.
- 11 Compare miles per hour for each trip.  $132 \div 3 = 44$  miles per hour, while  $200 \div 5 = 40$  miles per hour.
- 12 First find the unit rate:  $540 \div 9 = 60$  drinks per minute. Then multiply  $60 \times 15 = 900$  drinks.
- 13 Miles per gallon means miles for 1 gallon. Divide 360 miles by 12 gallons to get 30 miles per gallon.
- 14 First find muffins per batch:  $96 \div 4 = 24$ . For 7 batches, multiply  $24 \times 7 = 168$  muffins.
- 15 A rate of 15 pages per hour means multiply hours by 15. For 3 hours,  $15 \times 3 = 45$  pages, so choice B matches.

### 📅 Week 1 Day 5: Week 1 Mixed Review

#### ✔ Answers

- 1 7:3    2 6:20, or 3:10    3 False    4 70 miles per hour    5 B    6 8 folders for \$5.20
- 7 24; 15    8 9    9 No    10 36%    11 70%    12 30    13 30%    14 8 cups
- 15 24 students    16 A

#### 💡 Explanations



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- 1 The ratio starts as 14:6 because singers are named first. Divide both terms by 2 to simplify the ratio to 7:3.
- 2 This is part-to-whole because guitar players are compared with all musicians. There are  $14 + 6 = 20$  musicians total, and  $6:20$  simplifies to  $3:10$ .
- 3 Order matters in a ratio. The ratio 9:5 names 9 of the first quantity for 5 of the second, while 5:9 reverses the quantities.
- 4 Unit rate means distance for 1 hour. Divide 210 by 3 to get 70 miles per hour.
- 5 A rate compares quantities with different units. Dollars and pounds are different units, so choice B is a rate.
- 6 Find each unit price.  $\$3.75 \div 5 = \$0.75$  per folder, and  $\$5.20 \div 8 = \$0.65$  per folder, so the 8-folder option is cheaper.
- 7 From 3 to 9, multiply by 3, so  $8 \times 3 = 24$ . From 8 to 40, multiply by 5, so  $3 \times 5 = 15$ .
- 8 Divide  $y$  by  $x$  for either point.  $18 \div 2 = 9$  and  $45 \div 5 = 9$ , so the unit rate is 9.
- 9 The line shows a unit rate of 8, so when  $x = 4$ ,  $y$  should be 32. The point (4, 28) is below the line and does not fit.
- 10 Move the decimal point two places right to convert a decimal to a percent. The decimal 0.36 equals 36 hundredths, or 36%.
- 11 Change tenths to hundredths:  $\frac{7}{10} = \frac{70}{100}$ . A fraction of 70 per 100 equals 70%.
- 12 Convert 15% to 0.15 and multiply by the whole.  $0.15 \times 200 = 30$ .
- 13 Divide the part by the whole:  $27 \div 90 = 0.30$ . Convert 0.30 to 30%.
- 14 The water changed from 5 parts to 20 cups, which is multiplying by 4. Multiply the pineapple juice by the same factor:  $2 \times 4 = 8$  cups.
- 15 75% is three fourths, so find three fourths of 32. One fourth of 32 is 8, and  $3 \times 8 = 24$  students.



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- 16 Compute each words-per-minute rate. The rates are 12, 9, 10, and 9, so choice A has the greatest rate.
- 

PREVIEW



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