

Rising 7th Grade Summer Math Packet



Name: _____

7-3

Due on the first day back to school; August 20th, 2026

This will count as the first test grade of Marking Period 1.

This summer packet will help you review important math skills to get you ready for 7th grade. Show all your work, and try to complete the packet in small chunks instead of all at once.

Section 1: Integer Operations

Add and Subtract Integers

- $-12 + 7 =$ _____
- $15 + (-19) =$ _____
- $22 - (-6) =$ _____

ADDING & SUBTRACTING INTEGERS

ADDING INTEGERS

- SAME SIGNS:**
Add the numbers and keep the sign.
 $5 + 3 = 8$
 $-4 + (-7) = -11$
- DIFFERENT SIGNS:**
Subtract the numbers and keep the sign of the number with the greater absolute value.
 $7 + (-3) = 4$
 $-2 + 9 = 7$

REMEMBER:
A positive integer is above 0 on the number line.
A negative integer is below 0.

KEY IDEA: Think of integers on a number line.
Right = add (positive) | Left = subtract (negative)

SUBTRACTING INTEGERS

Change subtraction to addition of the opposite.
 $a - b = a + (-b)$

Then follow the rules for adding integers!

EXAMPLES:

- $5 - 3 = 5 + (-3) = 2$
- $-2 - 7 = -2 + (-7) = -9$
- $4 - (-6) = 4 + 6 = 10$
- $-8 - (-1) = -8 + 1 = -7$

Multiply and Divide Integers

- $(-6)(8) =$ _____
- $(-9)(-4) =$ _____
- $(-56) \div -7 =$ _____

MULTIPLYING & DIVIDING INTEGERS

MULTIPLYING INTEGERS

RULE:
Multiply the numbers. Use the sign rules below.

SIGN RULES:

$+$	$\times$	$+$	$=$	$+$	positive
$-$	$\times$	$-$	$=$	$+$	positive
$+$	$\times$	$-$	$=$	$-$	negative
$-$	$\times$	$+$	$=$	$-$	negative

EXAMPLES:

- $4 \times 3 = 12$
- $(-4) \times 3 = -12$
- $4 \times (-3) = -12$
- $(-4) \times (-3) = 12$

DIVIDING INTEGERS

RULE:
Divide the numbers. Use the same sign rules as multiplication.

SIGN RULES:

$+$	$\div$	$+$	$=$	$+$	positive
$-$	$\div$	$-$	$=$	$+$	positive
$+$	$\div$	$-$	$=$	$-$	negative
$-$	$\div$	$+$	$=$	$-$	negative

EXAMPLES:

- $15 \div 3 = 5$
- $(-15) \div 3 = -5$
- $15 \div (-3) = -5$
- $(-15) \div (-3) = 5$

REMEMBER: A negative divided by a negative is **POSITIVE**.

KEY IDEA:
Think of integers using positive and negative amounts or directions!
Multiply = repeated addition
Divide = split into equal groups

Order of Operations

- $18 - 4(2 + 3) =$ _____
- $7 + 12 \div 3 - 2 =$ _____
- $(-2)^3 + 5 =$ _____

ORDER OF OPERATIONS

Use this order to evaluate expressions.

P PARENTHESES Evaluate anything inside parentheses.	()	EXAMPLE: Evaluate: $3 + 4 \times (2 - 6)^2 \div 2$ ① Parentheses: $3 + 4 \times (-4)^2 \div 2$ ② Exponents: $3 + 4 \times 16 \div 2$ ③ Multiplication: $3 + 64 \div 2$ ④ Division: $3 + 32$ ⑤ Addition: 35
E EXPONENTS Evaluate powers and roots.	a^2	
M MULTIPLICATION Multiply from left to right.	$\times$	
D DIVISION Divide from left to right.	$\div$	
A ADDITION Add from left to right.	$+$	
S SUBTRACTION Subtract from left to right.	$-$	

TIPS:

- Always go from left to right within each step.
- Do all parentheses before exponents.

REMEMBER:
PEMDAS helps you solve problems in the correct order so you get the correct answer!

Section 2: Fractions and Decimals

Add and Subtract Fractions

- $\frac{3}{4} + \frac{1}{8} =$ _____
- $\frac{5}{6} - \frac{1}{3} =$ _____
- $2\frac{1}{5} + 1\frac{3}{10} =$ _____

ADDING & SUBTRACTING FRACTIONS

Use these rules for adding & subtracting fractions.

L LIKE DENOMINATORS
Keep the bottom number (denominator) the same and just add or subtract numbers (numerators). $\frac{2}{4} + \frac{1}{4} = \frac{3}{4}$

E UNLIKE DENOMINATORS
Find a Common Denominator (the smallest number that both denominators divide into). Then, convert.
 $\frac{1}{4} + \frac{2}{3} \rightarrow$ Use 12
 $\frac{1}{4} \times \frac{3}{3} = \frac{3}{12}$ and $\frac{2}{3} \times \frac{4}{4} = \frac{8}{12}$

C CONVERT MIXED NUMBERS
Convert Mixed Numbers to Improper Fractions first, if necessary. $1\frac{1}{2} = \frac{3}{2}$

R REDUCE/SIMPLIFY
Always check if your final fraction can be simplified to lowest terms. $\frac{6}{8} = \frac{3}{4}$

WORKED EXAMPLE:
Solve: $\frac{1}{4} + \frac{1}{3}$
① (Rule 1) Find Common Denominator (LCD) $\frac{1}{4}$ and $\frac{1}{3} \rightarrow \frac{3}{12}$ and $\frac{4}{12}$
② (Rule 2) Convert Fractions $\frac{1}{4} \rightarrow \frac{3}{12}$ $\frac{1}{3} \rightarrow \frac{4}{12}$
③ (Rule 3) Add/Subtract Numerators $\frac{3}{12} + \frac{4}{12} = \frac{7}{12}$
④ (Rule 4) Simplify (This one is already simplified.)

Solve: $\frac{1}{2} - \frac{1}{3}$
① (Rule 1) Common Denominator (LCD = 6)
Only convert $\frac{1}{2}$
② (Rule 2) Convert $\frac{1}{2} \rightarrow \frac{3}{6}$ $\frac{1}{3} \rightarrow \frac{2}{6}$ → Keep
③ (Rule 3) Subtract $\frac{3}{6} - \frac{2}{6} = \frac{1}{6}$
④ (Rule 4) Simplify (Simplified.)

TIPS:
• Always keep the denominator (bottom number) when adding or subtracting the numerators.
• The LCD (Least Common Denominator) is key for unlike denominators!

REMEMBER:
Correct conversions and checking for simplification helps you get the most accurate fraction answer!

Multiply and Divide Fractions

- $\frac{2}{3} \cdot \frac{9}{10} =$ _____
- $\frac{5}{8} \cdot 4 =$ _____
- $\frac{3}{5} \div \frac{9}{10} =$ _____

MULTIPLYING & DIVIDING FRACTIONS

Using key strategies for fraction operations.

M MULTIPLYING FRACTIONS
Multiply the Numerators together. Multiply the Denominators together. Simplify! $\frac{2}{3} \times \frac{4}{5} = \frac{8}{15}$

D DIVIDING FRACTIONS
Use Keep-Change-Flip (K-C-F) method. Keep first fraction, Change to multiplication, Flip second fraction.
 $\frac{1}{2} \div \frac{1}{4} \rightarrow \frac{1}{2} \times \frac{4}{1} = 2$

M MIXED NUMBERS
Convert Mixed Numbers to Improper Fractions first, for both multiplication and division. $1\frac{1}{2} = \frac{3}{2}$

S SIMPLIFYING ANSWERS
Always reduce your final fraction to its simplest form. $\frac{10}{12} = \frac{5}{6}$
Look for common factors.

MULTIPLYING EXAMPLE:
Solve: $1\frac{1}{2} \times \frac{2}{3}$
① (Rule M) Convert Mixed Numbers: $1\frac{1}{2} = \frac{3}{2}$
② (Rule M) Multiply: $\frac{3}{2} \times \frac{2}{3}$
③ (Rule S) Simplify (optional before multiply): $\frac{3}{2} \times \frac{2}{3} = 1$
④ (Rule S) Final Answer: 1

DIVIDING EXAMPLE:
Solve: $\frac{3}{4} \div \frac{1}{2}$
① (Rule D) Keep-Change-Flip: $\frac{3}{4} \times \frac{2}{1}$
② (Rule D) Multiply: $\frac{6}{4}$
③ (Rule M) Convert to Mixed Number: $\frac{6}{4} = 1\frac{2}{4}$
④ (Rule S) Simplify Final Answer: $1\frac{1}{2}$

TIPS:
• Multiplying fractions is usually direct: tops x tops, bottoms x bottoms!
• Don't forget that K-C-F *only* applies to division problems.

REMEMBER:
Always convert Mixed Numbers *before* doing any work, and always simplify your final answer for the best result!

Decimal and Percent

- Write 0.45 as a percent: _____
- Write 72% as a decimal: _____
- A shirt costs \$40 and is on sale for 15% off. What is the sales price?

CONVERTING & FINDING SALE PRICE

Key math strategies for everyday decimals, percents, and discounts.

P RULES & KEY STEPS
PERCENT TO DECIMAL
Move decimal 2 places LEFT (Divide by 100). 25% = 0.25

D DECIMAL TO PERCENT
Move decimal 2 places RIGHT (Multiply by 100). 0.4 = 40%

F FIND DISCOUNT AMOUNT
Multiply (decimal or fraction form) by Original Price form by Original Price.
 $\$100 \times 20\% = \20 Discount

S CALCULATE SALE PRICE
Bag 2 (Discount) → Result (Sale Price)
Subtract the Discount Amount from the Original Price.
 $\$100 - \$20 = \$80$ Sale Price

CONVERSION EXAMPLES:
Solve: 35% to Decimal
① (Rule P) Move decimal 2 places: 35% → 0.35
② Final: 0.35
Solve: 0.125 to Percent
① (Rule D) Move decimal 2 places: 0.125 → 12.5%
② Final: 12.5%

SALE PRICE EXAMPLE:
Solve: Original \$80, 15% OFF
① (Rule F) Convert % to Dec.: 15% = 0.15
② Find Discount: $\$80 \times 0.15 = \12
③ (Rule S) Final Sale Price: $\$80 - \$12 = \$68$

TIPS:
• "Of" usually means multiply in discount problems!
• Double-check your decimal placement; it's the most common mistake!

REMEMBER:
Always find the Discount Amount *first*, then subtract it from the original price to get the true Sale Price!

Section 3: Ratios and Proportions

1. Simplify the ratio 18:24
2. If 3 notebooks cost \$9, how much will 7 notebooks cost?
3. A car travel 180 miles in 3 hours. What is the unit rate?

RATIOS & PROPORTIONS

Key math strategies for comparing quantities and relationships.

R **RATIOS**
A comparison of two numbers (a to b, a:b, $\frac{a}{b}$).
Apples to Oranges = 3 to 2, 3:2, $\frac{3}{2}$

E **EQUIVALENT RATIOS**
Multiply or divide both terms by the same number. $\frac{1}{2} \times \frac{2}{2} = \frac{2}{4} = \frac{3}{6}$

P **PROPORTIONS**
Two ratios set equal to each other ($\frac{a}{b} = \frac{c}{d}$). $\frac{3}{4} = \frac{6}{8}$

C **CROSS-MULTIPLICATION**
Multiply the means and the extremes to check if ratios are proportional or to solve for a variable. $a \times d = b \times c$

TIPS:

- Check if ratios are proportional using cross-multiplication: ad must equal bc.
- To simplify a ratio, divide both terms by their Greatest Common Factor (GCF).

REMEMBER:
Keep the order of the items consistent in both ratios of a proportion. For example, if it's Apples over Oranges on one side, it must be Apples over Oranges on the other!

RATIO EXAMPLES:
Solve: Make Equivalent Ratios
① (Rule E) Multiply top & bottom by 2: $\frac{2}{3} \rightarrow \frac{2 \times 2}{3 \times 2}$
② Final: $\frac{4}{6}$

Solve: Write in 3 Ways
① Red to Blue: 5:3
② Red to Total: $\frac{5}{8}$

PROPORTION EXAMPLE:
Solve: Find "x" in $\frac{2}{5} = \frac{x}{15}$
① (Rule C) Cross-multiply: $2 \times 15 = 5 \times x$
② Multiply: $30 = 5 \times x$
③ Divide to find x: $x = 30 \div 5$
④ Final Answer: **x = 6**

Section 4: Expressions and Equations

Simplify Expressions

1. $4x + 3x - 5 =$ _____
2. $7a - 2 + 5a + 9 =$ _____
3. $3(2x+4) =$ _____

Solve Equations

1. $x + 12 = 31$
2. $5x = 45$
3. $3x - 7 = 20$

EXPRESSIONS & EQUATIONS

Key math strategies for working with mathematical statements.

E **EXPRESSIONS**
A mathematical phrase containing numbers, variables, and operators, with no equal sign. $2a - 7b + \frac{x}{4}$

S **SIMPLIFYING EXPRESSIONS**
Combining like terms and using properties to make the expression. $3a + 2a \rightarrow 5a$ $x^2 + 3x + x^2 \rightarrow 2x^2 + 3x$

Q **EQUATIONS**
A mathematical statement asserting that two expressions are equal, marked by an equal sign (=). $2x - 5 = 11$

V **SOLVING EQUATIONS**
Isolating the variable by performing inverse operations to find its value.
+/- Inverse: $x + 2 = 5 \rightarrow x = 3$ $2x + 4 = 10 \rightarrow 2x = 6 \rightarrow x = 3$

TIPS:

- Always distribute *before* combining like terms.
- To check your equation solution, substitute the value back into the ex original equation to see if both sides are equal.

REMEMBER:
Keep equations balanced! Whatever operation you perform to one side, you *must* perform to the other side exactly. Think of the equal sign as a fulcrum.

EXPRESSION EXAMPLES:
Solve: Combine Like Terms
① (Rule S) Group the like terms: $2x + 3x + 4y - 2y + 5 \rightarrow 2y$ and 5
② (Rule S) Simplify each group: $2x + 3x = 5x$ $4y - 2y = 2y$
③ Final Simplified Express: $5x + 2y + 5$

Solve: Distribute & Simplify
① (Rule S) Distribute the 3: $3(x + 2) + 4 \rightarrow 3x + 6 + 4$
② (Rule S) Final Simplified E. $3x + 10$

EQUATION EXAMPLE:
Solve: Find "x" in $3x + 4 = 19$
① (Rule V) Subtract 4 from both sides: $3x + 4 - 4 = 19 - 4$
② Simplify: $3x = 15$
③ (Rule V) Divide by 3 on both sides: $\frac{3x}{3} = \frac{15}{3}$
④ Final Answer: **x = 5**

Section 5: Geometry

Area and Perimeter

1. Find the area of a square with a side of 7 cm.

area = _____ cm

2. Find the perimeter of a rectangle with length of 12 cm and a width of 5 cm.

perimeter = _____ cm

PERIMETER & AREA

Key math strategies for measuring shapes.

P **PERIMETER**
The distance around the outside of a flat shape.

A **AREA**
The total amount of space inside a flat surface.

R **RECTANGLE**
Perimeter: $P = 2\ell + 2w$
Area: $A = \ell \times w$

T **TRIANGLE**
Perimeter: $P = a + b + c$
Area: $A = \frac{1}{2}b \times h$

C **CIRCLE**
Circumference: $C = 2\pi r$ (approx. 3.14)
Area: $A = \pi r^2$

PERIMETER EXAMPLES:
Solve: Perimeter of Rectangle ($3m \times 5m$)
① (Rule R) Use Formula: $P = 2\ell + 2w \rightarrow P = 2(5) + 2(3)$
② Calculate: $P = 10 + 6$
③ Final Answer: $P = 16m$
Solve: Perimeter of Triangle ($a=4, b=5, c=6$ cm)
① (Rule T) Add Sides: $P = 4 + 5 + 6$
② Final Answer: $P = 15$ cm

AREA EXAMPLES:
Solve: Area of Square (side=4 cm)
① (Rule R) Use Formula: $A = \ell \times w \rightarrow A = 4 \times 4$
② Final Answer: $A = 16$ cm²
Solve: Area of Triangle ($b=8, h=3$ m)
① (Rule T) Use Formula: $A = \frac{1}{2}bh \rightarrow A = \frac{1}{2}(8)(3)$
② Calculate: $A = \frac{1}{2}(24) \rightarrow A = 12$
③ Final Answer: $A = 12$ m²
Solve: Area of Circle ($r=2$ cm, $\pi \approx 3.14$)
① (Rule C) Use Formula: $A = \pi r^2 \rightarrow A = 3.14 \times (2)^2$
② Calculate: $A = 3.14 \times 4 \rightarrow A = 12.56$
③ Final Answer: $A \approx 12.56$ cm²

TIPS:

- Always check if your final units are correct (linear for Perimeter, squared for Area).
- Draw the shape and label all sides to help visualize the formula.

REMEMBER:
Units matter! Area is in square units like cm², m², while Perimeter is in linear units like cm, m.

Section 6: Statistics

Mean, Median, Mode, & Range

Use the data set below for questions 1 – 4:

12, 15, 18, 12, 20, 25, 18

- Mean: _____
- Median: _____
- Mode: _____
- Range: _____

Find the mean of:

8, 12, 15, 9, 16

Mean: _____

MEAN, MEDIAN, MODE & RANGE

Key math strategies for analyzing data sets.

M **MEAN (The Average)**
The sum of all numbers divided by the count.

D **MEDIAN (The Middle)**
The middle number in an ordered data set.

O **MODE (The Most Frequent)**
The number(s) that appear most often.

R **RANGE (The Spread)**
The difference between the highest and lowest values.

DATA ANALYSIS EXAMPLES:
Example Data Set: {3, 7, 5, 12, 3, 9, 8}
CALCULATING MEAN:
Solve for Mean:
① (Step 1) Find the Sum: $3+7+5+12+3+9+8=47$
② (Step 2) Divide by Count (7): $\frac{47}{7}$
③ Final Answer: Mean ≈ 6.7
CALCULATING MEDIAN:
Solve for Median:
① (Step 1) Order the data: {3, 3, 5, 7, 8, 9, 12}
② (Step 2) Find the Middle: The number in position 4 is 7.
③ Final Answer: Median = 7
CALCULATING MODE:
Solve for Mode:
① (Step 1) Count frequencies: 3 occurs twice; all others once.
② Final Answer: Mode = 3
CALCULATING RANGE:
Solve for Range:
① (Step 1) Order to find High/Low: {3, ..., 12}
② (Step 2) Subtract: Highest (12) - Lowest (3) = 12 - 3
③ Final Answer: Range = 9

TIPS:

- Always order your data set first; it helps with Median and Range.
- There can be more than one Mode (multimodal) or no Mode at all.

REMEMBER:
Data statistics give you a summary. Mean, Median, and Mode show central tendency, while Range shows spread!

Section 7: Word Problems

1. Maria earns \$12 per hour babysitting. If she works 18 hours, how much more money will she earn?
2. A movie theater sold 245 tickets on Friday and 318 on Saturday. How many tickets were sold altogether?
3. A water bottle holds 0.75 liters of water. How much water is in 8 bottles?

Section 8: Challenges

1. The sum of three consecutive integers is 96. What are the integers?
2. Twice a number plus its half equals 45. Find the number.
3. A number divisible by both 6 and 8. What is the smallest possible positive number?