

Name: _____



Rising Algebra 1/Math 8
Summer Packet
2019



Directions for Summer Packet:

1. Put your name on the packet! Do all work in PENCIL only!
2. Read each page carefully for all instructions and examples.
3. Following the examples given (or by how your last teacher showed you), complete each problem. Show any and all work necessary for each problem! Feel free to attach more paper as needed (write the page number on it).
4. Calculators may be used, but try to avoid them if possible.
5. Packets will be scored during the first week of school by your teacher.
6. Students should expect a quiz on the material in this packet, usually the first week of school.
7. Good luck and enjoy your summer!

Suggested Timeline for Completing the Summer Packet

Week 1 - June 17-21

Comparing Integers/Absolute Value & Integer Operations (p. 4-5)

Week 2 - June 24-28

More Integer Practice & Multiplying & Dividing Integers (p. 6-7)

Week 3 - July 1-5

Fraction Review & Adding /Subtracting Fractions and Mixed Numbers (p. 8-9)

Week 4 - July 8-12

Order of Operations and Combining Like Terms (p. 10-11)

Week 5 - July 15-19

Distributive Property (p. 12)

Week 6 - July 22-26

Adding, Subtracting, Multiplying, and Dividing Equations (p. 13-14)

Week 7 - July 29-August 2

Two Step Equations & Proportions (p. 15-16)

Week 8 - August 5-9

Writing Algebraic Expressions (p. 17)

Week 9 - August 12-16

Properties (p. 18)

Comparing Integers/Absolute Value

Use $<$, $>$, or $=$ to answer the following.

1) $8 \bigcirc -8$

2) $0 \bigcirc -3$

3) $-5 \bigcirc -16$

4) $|-4| \bigcirc 4$

5) $-12 \bigcirc -20$

6) $-3 \bigcirc |-4|$

Put the integers in ascending order.



7) $-4, 5, -2, 1$

8) $-2, -7, -10, -3$

9) $-14, 12, |-17|, 5$

10) $-3, |-4|, -2, |5|$

Absolute Value is the distance a number is from zero (always positive).

For example $|-4| = 4$; $|5| = 5$

1) $|-2| =$

2) $|8| =$

3) $|-5| =$

4) $|12| =$

5) $|-21| =$

6) $|-83| =$

7) $|100| =$

8) $|-142| =$

9) $|-231| =$

10) $|250| =$

Integer Operations

Do NOT Use a calculator on pages 4-7

***REMEMBER...**

SAME SIGNS: ADD AND KEEP THE SIGN

OPPOSITE SIGNS: SUBTRACT AND KEEP THE SIGN OF THE BIGGEST NUMBER.

MINUS A NEGATIVE: MAKE IT A BIG PLUS

1) $(-12) + 7$

2) $(-10) + (-7)$

3) $8 + 7$

4) $38 + (-5)$

5) $(-1) + (-46)$

6) $(-30) + 10$

7) $13 + (-29)$

8) $2 - (-2)$

9) $(-29) - 29$

10) $(-8) - (-6)$

11) $48 - (-31)$

12) $18 - 41$

More Integer Practice

1) $8 + (-18)$	2) $-7 + (-8)$
3) $-24 + 0$	4) $-9 + (-3)$
5) $(-10) + (-13)$	6) $40 + (-6)$
7) $19 + (-2) + (-17)$	8) $4 - 10$
9) $3 - (-15)$	10) $11 - 13$
11) $34 - (-10)$	12) $-7 - (-7)$
13) $(-10) - 47 + 12 - 3$	14) $(-29) - 29 + (-13) - 1$
15) $38 + 22 - 14 + 3$	16) $13 + (-29) - (-5) + 2$

Multiplying & Dividing Integers

<p>Example: Multiplying two positive or two negative integers gives you a positive product. $8(7)=56$ and $-6(-3)=18$</p> <p>Example: Multiplying a negative and a positive integer gives you a negative product. $-5(4)=-20$ and $3(-4)=-12$</p>	<p>Example: Dividing two positive or two negative integers gives you a positive quotient. $-56 / -7 = 8$ and $28 \div 7 = 4$</p> <p>Example: Dividing a negative and a positive integer gives you a negative quotient. $-21 \div 7 = -3$ and $36 \div (-9) = -4$</p>
1. $5(-9)$	1. $81 \div 9$
2. $-7(3)$	2. $30 \div (-5)$
3. $-6(-5)$	3. $42 \div (-6)$
4. $-8(0)$	4. $-96 / 12$
5. $-12(12)$	5. $-54 \div 3$
6. $8(-5)$	6. $52 \div (-4)$
7. $(-6)(-10)(-8)$	7. $\frac{-4}{-1}$
8. $6 \cdot 6 \cdot -2$	8. $\frac{60}{-15}$
9. $11(-13)$	9. $\frac{12}{4}$

Fraction Review - ALWAYS REDUCE!!

1) $\frac{12}{20}$	2) $\frac{7}{21}$
3) $\frac{27}{33}$	4) $\frac{63}{81}$
5) $\frac{78}{112}$	6) $\frac{14}{56}$

<p>Improper Fraction to Mixed Number Example</p> <p>$\frac{37}{2}$ Think - how many times does 2 go into 37?</p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center;"> $\begin{array}{r} 18 \text{ whole} \\ 2 \overline{) 37} \\ \underline{-2} \\ 17 \\ \underline{-16} \\ 1 \text{ numerator} \end{array}$ </div> <div style="margin: 0 20px;"> $18\frac{1}{2}$ </div> </div> <p>denom. \swarrow</p>	1) $\frac{25}{6}$	2) $\frac{230}{35}$
	3) $\frac{54}{3}$	4) $\frac{338}{10}$

<p>Mixed Number to Improper Fraction Example</p> <p>$3\frac{4}{5} = \frac{5 \times 3 + 4}{5} = \frac{15 + 4}{5} = \frac{19}{5}$</p>		
5) $2\frac{9}{16}$	6) $6\frac{7}{11}$	7) $8\frac{9}{30}$

Adding/Subtracting Fractions and Mixed Numbers

Simplify. Write final answer as a fraction or mixed number in lowest terms.

1) $\frac{5}{4} - \frac{3}{4}$

2) $\frac{1}{3} - \left(-\frac{5}{3}\right)$

3) $\frac{1}{5} + \frac{1}{5}$

4) $\frac{3}{8} + \left(-\frac{1}{3}\right)$

5) $3\frac{6}{7} + 1\frac{1}{7}$

6) $\left(-\frac{4}{3}\right) - \left(-\frac{3}{2}\right)$

Multiplying/Dividing Fractions and Mixed Numbers

Simplify. Write final answer as a fraction or mixed number in lowest terms.

1) $-\frac{5}{4} \cdot \frac{1}{3}$

2) $\frac{4}{9} \cdot \frac{7}{4}$

3) $\left(-2\frac{1}{5}\right) \cdot \left(-1\frac{3}{4}\right)$

4) $-\frac{1}{2} \div \frac{5}{4}$

5) $-\frac{9}{5} \div 2$

6) $\frac{1}{9} \div \left(1\frac{1}{3}\right)$

Order of Operations

Use the acronym GEMDAS:

G - Grouping symbols such as parentheses, brackets, set notation, and fraction bars

E - Exponents

M/D - Multiplication & division in order from left to right

A/S - Addition & subtraction in order from left to right

Simplify:

1) $6 + 4 - 2 \cdot 3$

2) $(-2) \cdot 3 + 5 - 7$

3) $29 - 3 \cdot 9 + 4$

4) $18 - 4^2 + 7$

5) $\frac{10 - (27 \div 9)}{4 - 7}$

6) $6 \cdot 5 - 56 \div 7 + 7 \cdot 2$

Evaluating Expressions

Evaluate = plug in for the variable and simplify

Example: given $x = 2$ and $y = 4$, evaluate $3x + y$ SOLUTION = $3(2) + (4) = 6 + 4 = 10$

Evaluate each expression given that $x = 5$, $y = -4$, and $z = 6$

1) $3x - z$

2) $2xy + z$

3) $2(x + z) - y$

4) $-2xyz + x$

Combining Like Terms

Example $4x + 5y - 6x - 2y$ $4x - 6x + 5y - 2y$ $-2x + 3y$	1) $5y - y$
2) $x - 4x$	3) $m - \frac{1}{2}m$
4) $11x + 3y - 5x$	5) $13a - 13b - 13c + 15a$
6) $\frac{2}{5}y + \frac{3}{5}x + \frac{1}{5}y - \frac{2}{5}x$	7) $17a + 18b - 20b + a$
8) $5 + 3x + 2x + 55$	9) $x + 2 - 4x - 8$

Distributive Property

Multiply the term on the outside of the parentheses through to all terms inside the parentheses.

Example: $4(x + 9) = 4(x) + 4(9)$
 $= 4x + 36$

1) $5(11 + x)$

2) $-4(x - 7)$

3) $8(5w + 9)$

4) $5(x + y)$

5) $-3(2k + 10m - 3)$

6) $9(r + 7) + 12r$

7) $3(8 + a) + 7(6 + 4a)$

8) $6(x + y) - 4(2x + 3y)$

9) $-8(-5b + 7) + 5b$

Addition & Subtraction Equations

Example:

$$\begin{array}{r|l} C + 3 = 12 & \text{check} \\ \hline -3 & -3 \\ \hline C = 9 & 9 + 3 = 12 \\ & 12 = 12 \checkmark \end{array} \quad \begin{array}{r|l} g - 12 = 5 & \text{Check} \\ \hline +12 & +12 \\ \hline g = 17 & \begin{array}{r} 17 \\ -12 \\ \hline 5 = 5 \checkmark \end{array} \end{array}$$

1) $n + 28 = 84$

2) $x - 48 = 129$

3) $y + 59 = 194$

4) $b + 48 = 190$

5) $p - 167 = 75$

6) $r - 46 = 278$

7) $x + 87 = 364$

8) $a - 76 = 69$

Multiplication & Division Equations

Example:

$$\begin{array}{r|l} \frac{d}{3} = 21 & \\ \hline \times 3 & \times 3 \\ \hline d = & 63 \end{array}$$

check

$$\begin{array}{r} 21 \\ 3 \overline{)63} \\ \underline{-6} \\ 03 \\ \underline{-3} \\ 0 \end{array}$$

$$\begin{array}{r|l} 7r = 42 & \text{check} \\ \hline \div 7 & \div 7 \\ \hline r = & 6 \end{array} \quad \begin{array}{l} 7 \cdot 6 \\ 42 = 42 \checkmark \end{array}$$

1) $2y = 98$

2) $7x = 168$

3) $\frac{b}{22} = 6$

4) $\frac{x}{2} = 9$

5) $33 = \frac{y}{16}$

6) $27m = 972$

7) $432 = 36a$

8) $84 = \frac{m}{4}$

TWO STEP EQUATIONS

Solving Equations

To solve an equation means to **find the value** of the variable. We solve equations by isolating the variable using opposite operations.

Example:

Solve.

$$\begin{array}{r} 3x - 2 = 10 \\ + 2 \quad + 2 \end{array}$$

Isolate 3x by adding 2 to each side.

$$\frac{3x}{3} = \frac{12}{3}$$

Simplify

Isolate x by dividing each side by 3.

$$x = 4$$

Simplify

Check your answer.

$$3(4) - 2 = 10$$

Substitute the value in for the variable.

$$12 - 2 = 10$$

Simplify

$$10 = 10$$

Is the equation true? If yes, you solved it correctly!

Opposite Operations:
Addition (+) & Subtraction (-)
Multiplication (x) & Division (÷)

Please remember...
to do the same step on
each side of the equation.

**Always check your
work by substitution!**

Example

$$\begin{array}{r|l} -3x + 5 = 26 & \\ \hline -5 & -5 \\ \hline -3x & 21 \\ \hline -3 & -3 \\ \hline x = & -7 \end{array} \quad \begin{array}{l} \text{check} \\ -3(-7) + 5 \\ 21 + 5 \\ 26 = 26 \checkmark \end{array}$$

1) $7y + 9 = 72$

2) $4x - 6 = 38$

3) $\frac{x}{6} + 4 = -4$

4) $5m + 4 = -51$

5) $49 = 7(y - 7)$

Proportions:

REMEMBER, CROSS MULTIPLY!

Solve for the variable and write the answer as a fraction in lowest terms.

$$1) \frac{4}{9} = \frac{2}{x}$$

$$2) \frac{8n}{8} = \frac{8}{3}$$

$$3) \frac{7}{9} = \frac{a}{5}$$

$$4) \frac{3}{13} = \frac{x}{3}$$

$$5) \frac{10}{12} = \frac{2}{n}$$

$$6) \frac{x}{9} = \frac{4}{6}$$

$$7) \frac{x}{12} = \frac{10}{2}$$

$$8) \frac{3x}{5} = \frac{6}{10}$$

Writing Algebraic Expressions

Example 5 less than 2 times a number $2g - 5$	1) 5 more than x
2) C less than 5	3) P added to 10
4) The product of 3 and h	5) Half of y
6) A number y increased by itself	7) Three less than twice y
8) 2 more than the product of 6 and y	9) The quotient of a number divided by 10
10) The perimeter of a square with sides length x	11) 5 more than 2 times a number
12) 2 diminished by 7 times a number	13) Twice a number, decreased by 7
14) One-fourth of a number	15) 9 times a number, increased by 4 times the number

Properties: Match the following properties to their example.

(note: some may be used more than once and some not all)

- A. Commutative of Addition
- B. Associative of Addition
- C. Identity of Addition
- D. Inverse of Addition
- F. Commutative of Multiplication
- G. Associative of Multiplication

- H. Identity of Multiplication
- J. Inverse of Multiplication
- K. Distributive
- L. Multiplication of Zero
- M. Multiplication of -1

- | | | | |
|-----------|---|-----------|---|
| _____ 1. | $7 \cdot \frac{1}{7} = 1$ | _____ 13. | $(4 + 5) + 2 = 4 + (5 + 2)$ |
| _____ 2. | $-1(5) = -5$ | _____ 14. | $19 + 0 = 19$ |
| _____ 3. | $8 \cdot 4 \cdot 2 = 8 \cdot 2 \cdot 4$ | _____ 15. | $15(-1) = -15$ |
| _____ 4. | $4 + 7 + 6 = 7 + 6 + 4$ | _____ 16. | $4 + 11 = 11 + 4$ |
| _____ 5. | $4 \cdot 7 + 4 \cdot x = 4(7 + x)$ | _____ 17. | $6 \cdot 9 \cdot 2 = 2 \cdot 9 \cdot 6$ |
| _____ 6. | $(a + b)7 = 7(a + b)$ | _____ 18. | $1 \cdot 23 = 23$ |
| _____ 7. | $(3 + 2) + 1 = 3 + (2 + 1)$ | _____ 19. | $\frac{2}{3} \cdot \frac{3}{2} = 1$ |
| _____ 8. | $7 \cdot 0 = 0$ | _____ 20. | $(3x^2) \cdot 1 = 3x^2$ |
| _____ 9. | $53 + (-53) = 0$ | _____ 21. | $25 \cdot 0 \cdot 4 = 0$ |
| _____ 10. | $8 + 0 = 8$ | _____ 22. | $-1 + 0 = -1$ |
| _____ 11. | $(4 \cdot 7) \cdot 3 = 4 \cdot (7 \cdot 3)$ | _____ 23. | $9(x + 3) = 9x + 27$ |
| _____ 12. | $-2(x - 3) = -2x + 6$ | _____ 24. | $x + (-x) = 0$ |