

Name _____

Summer Math Packet

Algebra 1

Students who have completed PreAlgebra.

Integers

Decimals

Fractions

Real Numbers

Order of Operations

Expressions

Absolute Value

Distributive Property

Get Ready For Algebra 1

Hello! I'm so excited to meet each of you. I'm sure 4 days of math in the middle of your summer was not exactly your idea of a good time -- however, my goal is to get you as well prepared for your jump into the world of Algebra as I possibly can. I promise, you will thank me later ;)

This summer, I want to encourage you to continue to practice your mathematics at home. Being actively involved in mathematical activities enhances learning. In preparation for the 2019-2020 school year, I have listed below several math websites that can be referenced for review, practice, and tutoring:

www.kutasoftware.com

www.purplemath.com

www.edhelper.com

www.coolmath.com

www.khanacademy.com

www.aplusmath.com

www.IXL.com

www.studyisland.com

Below, I have offered a few more recommendations on how to be successful in any math class. These are just general suggestions, please make certain to listen closely to your teacher and read your class syllabus for specific class requirements:

- Complete each problem and show all steps used to arrive at the final answer.
 - Show all work neatly.
- Make sure to number each problem as it appears in your textbook. All work must be neatly presented.
 - Box your final answers.
- Label answers when necessary (inches, feet, miles, cups, months, etc).
 - Use a calculator only if necessary and allowed.
 - Do not rush! Use time wisely.
- If you are stuck on particular problems, check through your class notes/examples from class discussion. Parents may also be able to help.

Integers – Multiplying and Dividing

Rules:

- 1) If two numbers have the same sign, their product or quotient is positive.
 $(-7)(-5) = 35$ $6 \cdot 8 = 48$
- 2) If two numbers have opposite signs, their product or quotient is negative
 $9(-2) = -18$ $(-3)(4) = -12$

NO CALCULATOR!

1. $(-8)(3) =$	2. $(4)(-4) =$
3. $(20)(-65) =$	4. $-7 \cdot -5 =$
5. $-45 \div 9 =$	6. $\frac{-24}{-4} =$
7. $49 \div (-7) =$	8. $\frac{-99}{9} =$
9. $(5)(-2)(7) =$	10. $(-3)(-1)(4)(-6) =$
11. $-3740 \div (-10) =$	12. $\frac{56}{-7} =$
13. $(11)(-1)(-7)(-3) =$	14. $\frac{39}{13} =$
15. $(-72) \div (-12) =$	16. $(-9)(8)(-2)(5) =$

Decimals – Adding and Subtracting

Rules:

- 1) Line up decimal points, if a number does not have a decimal point it is a whole number with the decimal point at the end.
- 2) Annex zeros to hold place.
- 3) Add or subtract vertically.
- 4) Bring down the decimal point.

$$4.1 + 3 + 5.61 + 21$$

$$16 - 7.498$$

$$4.10$$

$$16.000$$

$$3.00$$

$$- \underline{7.498}$$

$$5.61$$

$$8.502$$

NO CALCULATOR!

1. $5.1 + 2.23 + 8$

2. $9 + 3.3 + 0.781$

3. $6.7 - 3.987$

4. $5.21 + 6.5 + 8.123$

5. $9.8 - 2.0871$

6. $7.3 + 4.3 + 12 + 0.543$

7. $9.1 + 7.89 - 2.6$

8. $16 - 7.5 + 3.12$

9. $2.8 + 15 - 9.12$

10. $7.8 - 2.3 + 15$

11. $8 + 4.1 - 0.123$

12. $6.3 - 0.45 + 2.45$

Rules:

Multiplying

- 1) Line up digits, starting on the right.
- 2) Multiply
- 3) Place the decimal point in the answer by starting at the right and moving a number of places equal to the sum of the decimal places in both numbers multiplied.

$$\begin{array}{r} (6.432)(4.15) \\ 6.432 \text{ (3 decimal places)} \\ \times 4.15 \text{ (2 decimal places)} \\ \hline 32160 \\ 64320 \\ \hline 2572800 \\ 26.69280 \text{ (5 decimal places)} \end{array}$$

Dividing

- 1) If the divisor is not a whole number, move the decimal point To the right to make it a whole number and move the decimal Point in the dividend the same number of places.
- 2) Divide.
- 3) Bring the decimal point up.

$$\begin{array}{r} 27.216 \div 4.8 \\ \hline 5.67 \\ 48.)272.16 \\ \underline{-240} \\ 321 \\ \underline{-288} \\ 336 \\ \underline{-336} \end{array}$$

NO CALCULATOR!

1. $5.4(0.5)$	2. $5.9(0.07)$	3. $0.68 \cdot 0.14$	4. $4.29 \cdot 0.4$
5. $69.3(0.7)$	6. $9.01(0.15)$	7. $36 \cdot 3.3$	8. $36.8 \cdot 0.55$
9. $0.24 \div 0.8$	10. $84.48 \div 0.88$	11. $\frac{8.3638}{1.9}$	12. $\frac{487.2}{0.56}$
13. $34.06 \div 0.13$	14. $147 \div 0.49$	15. $\frac{9.447}{6.7}$	16. $\frac{167.4}{0.093}$

Rules:

1) Find LCD.

2) Change to equivalent fractions.

3) Rename, if needed.

4) Add or Subtract.

5) Simplify

$$3\frac{1}{9} = 3\frac{2}{18} = 2\frac{20}{18}$$

$$-1\frac{5}{6} = -1\frac{15}{18} = -1\frac{15}{18}$$

$$4\frac{3}{4} = 4\frac{9}{12}$$

$$+ 5\frac{5}{6} = +5\frac{10}{12}$$

$$1\frac{5}{18}$$

$$9\frac{19}{12} = 10\frac{7}{12}$$

NO CALCULATOR!

1. $2\frac{3}{4} + 5\frac{5}{6}$	2. $9 - 4\frac{2}{5}$	3. $6\frac{1}{3} + 4\frac{3}{5}$	4. $8\frac{1}{9} - 2\frac{5}{6}$
5. $9 + 1\frac{1}{7}$	6. $6\frac{1}{2} + 2\frac{2}{3}$	7. $5\frac{1}{2} + 1\frac{3}{5}$	8. $1\frac{3}{4} - \frac{1}{2}$
9. $\frac{1}{5} + 1\frac{3}{4}$	10. $\frac{4}{5} - \frac{2}{3}$	11. $\frac{5}{7} + 1\frac{4}{5}$	12. $3\frac{5}{8} - 2\frac{1}{6}$

Rules:

- 1) Change all mixed numbers to improper fractions.
- 2) Multiplying across.
- 3) Simplify

$$2\frac{2}{3} \cdot 4\frac{1}{10} = \frac{8}{3} \cdot \frac{41}{10} = \frac{4}{3} \cdot \frac{41}{5} = \frac{164}{15} = 10\frac{14}{15}$$

- 1) Change all mixed numbers to improper fractions.
- 2) Take the reciprocal.
- 3) Multiply across.
- 4) Simplify

$$2\frac{3}{4} \div 3\frac{1}{2} = \frac{11}{4} \div \frac{7}{2} = \frac{11}{4} \cdot \frac{2}{7} = \frac{11}{2} \cdot \frac{1}{7} = \frac{11}{14}$$

NO CALCULATOR!

1. $2\frac{3}{4} \cdot 1\frac{5}{11}$	2. $9 \cdot 4\frac{2}{3}$	3. $1\frac{1}{3} \cdot 4\frac{1}{6}$	4. $1\frac{1}{9} \cdot 2\frac{2}{5}$
5. $9 \cdot 1\frac{1}{3}$	6. $6\frac{1}{2} \cdot 2\frac{1}{13}$	7. $5\frac{1}{2} \div 1\frac{3}{4}$	8. $1\frac{3}{4} \div \frac{1}{2}$
9. $\frac{1}{5} \div 1\frac{3}{4}$	10. $\frac{4}{5} \div \frac{2}{3}$	11. $\frac{9}{20} \div 1\frac{4}{5}$	12. $3\frac{2}{8} \div 2\frac{1}{6}$

Use rules of integers, decimals and fractions.

Examples:

$$-4.1 - (-2.51) = -4.1 + 2.51$$

$$-1\frac{3}{4} + (-2\frac{5}{6}) = -\frac{7}{4} + (-\frac{17}{6}) = -\frac{21}{12} + (-\frac{34}{12}) = -\frac{45}{12} = -\frac{15}{4} = -3\frac{3}{4}$$

opposite -4.10
 signs +2.51
 subtract -1.59

NO CALCULATOR!

1. $3.98 - 6$	2. $5.8 + (-2.5)$	3. $1.8 - (-3.7)$	4. $7 + (-2.8)$
5. $(-0.8) + (-7.2) - 5.4$	6. $1.7 - (-0.8) + 4.013$	7. $-1\frac{1}{2} + 1\frac{3}{5}$	8. $-1\frac{3}{4} - (-\frac{1}{2})$
9. $-\frac{1}{5} + 1\frac{3}{4}$	10. $\frac{2}{5} - \frac{4}{5}$	11. $\frac{5}{7} + (-1\frac{4}{5})$	12. $-1\frac{5}{8} - 2\frac{1}{6}$

Use rules of integers, decimals and fractions.

Examples:

$$-4.12(-5.3)$$

$$\begin{array}{r} -4.12 \\ \times -5.3 \\ \hline 1236 \\ 20600 \\ \hline +21836 \end{array}$$

$$51 \div (-0.25)$$

$$\begin{array}{r} -205 \\ 025 \overline{)5100.} \\ \underline{50} \\ 100 \\ \underline{100} \\ 0 \end{array}$$

$$-2\frac{2}{3} \cdot 4\frac{1}{10} = -\frac{8}{3} \cdot \frac{41}{10} = -\frac{4}{3} \cdot \frac{41}{5} = -\frac{164}{15} = -10\frac{14}{15}$$

$$-2\frac{3}{4} \div -3\frac{1}{2} = -\frac{11}{4} \div -\frac{7}{2} = -\frac{11}{4} \cdot -\frac{2}{7} = -\frac{11}{2} \cdot -\frac{1}{7} = \frac{11}{14}$$

NO CALCULATOR!

1. -5.5×-4.87	2. $1.5(-7.1)$	3. $1.7(-3.1)$	4. -7.8×-5.1
5. $4.2 \div (-2.1)$	6. $-2 \div (-0.5)$	7. $\frac{-6.4}{0.04}$	8. $\frac{6.6}{-1.1}$
9. $-\frac{1}{5} \cdot 1\frac{3}{4}$	10. $\frac{2}{5} \cdot 1\frac{1}{4}$	11. $\frac{5}{7} \cdot (-1\frac{4}{5})$	12. $(-1\frac{5}{8})(-3\frac{1}{5})$
13. $-\frac{3}{2} \div -\frac{10}{7}$	14. $-2 \div -3\frac{4}{5}$	15. $\frac{1}{9} \div -1\frac{1}{3}$	16. $-3\frac{7}{10} \div 2\frac{1}{4}$

Order of Operations

Parentheses (Grouping Symbols)	$((7 - 4)^2 + 3) + 15$	$\frac{(9-7)^2 + 6}{2}$
Exponents	$= [3^2 + 3] + 15$	$= \frac{11-6}{2} + 6$
Multiply or Divide, from left to right	$= [9 + 3] + 15$	$= \frac{5}{2} + 6$
Add or Subtract, from left to right	$= 12 + 15$	$= \frac{10}{2}$
		$= 5$

NO CALCULATOR!

1. $6 + 3 + 2 \cdot 7$	2. $5 + 8 \cdot 2 - 4$	3. $16 + 8 \cdot 2^2$	4. $10 + (3 + 2) + 9$
5. $7[(18 - 6) - 6]$	6. $3(2.7 + 0.9) - 5$	7. $6(5 - 3)^2 + 3$	8. $[10 + (5^2 \cdot 2)] + 6$
9. $\frac{1}{3}(9 \cdot 3) + 18$	10. $\frac{1}{2} \cdot 26 - 3^2$	11. $2.5 \cdot 0.5^2 + 5$	12. $\frac{16}{8} + 2^3 - 10$
13. $\frac{9 \cdot 2}{4 + 3^2 - 1}$	14. $\frac{13 - 4}{18 - 4^2 + 1}$	15. $\frac{5^2 \cdot 2}{1 + 6^2 - 8}$	16. $\frac{7 \cdot 4}{8 + 7^2 - 1}$

Write the verbal phrase as an algebraic expression.	
Eleven less than the quantity four times a number x	$4(x - 11)$
Evaluate the expression	
$x^2 + 4 - x$, when $x = 6$	$6^2 + 4 - 6$ $= 36 + 4 - 6$ $= 40 - 6$ $= 34$

Write the verbal phrase as an algebraic expression.

1. four times a number x decreased by twelve	2. six less than double a number x
3. five squared minus a number x	4. three more than the product of five and number x
5. twenty-nine decreased by triple a number x	6. two cubed divided by a number x
7. the quotient of a number x and two-tenths	8. the difference of ten and a number x

NO CALCULATOR!

Evaluate the expression

9. $y \div 3 + 2$, when $y = 30$	10. $\frac{r}{s} \cdot 7$, when $r = 30$ and $s = 5$
11. $5x^2 - y$, when $x = 4$ and $y = 26$	12. $3r^2 - 17$, when $r = 6$
13. $\frac{4}{5} \div n + 13$, when $n = \frac{1}{5}$	14. $\frac{9}{10} \cdot y - \frac{3}{10}$, when $y = \frac{1}{2}$

Absolute Value

The absolute value of a real number is the distance between the origin and point representing the number.

If a is a positive number, then $|a| = a$

If a is 0, then $|a| = 0$

If a is a negative number, then $|-a| = a$

$$|12| = 12$$

$$|0| = 0$$

$$|-12| = 12$$

$$|x| = 7, \text{ then } x = 7 \text{ and } -7$$

$$|x| = -5, \text{ then there is no solution}$$

1. $ 17 $	2. $ -4 $	3. $ -4.5 $	4. $\left \frac{2}{3}\right $
5. $\left -\frac{4}{5}\right $	6. $ 0 + 2$	7. $ 6.3 - 3.1$	8. $-\left -\frac{8}{9}\right $
9. $ -6.1 - 6.01$	10. $ -6.4 - 3.1$	11. $x = -9 $	12. $ x = -11$
13. $ x = 4$	14. $ x = 5$	15. $x = -3.8 $	16. $ -x = 1$

Distributive Property

Distributive Property $a(c) = ab + bc$ $(b + c)a = ba + ca$ $a(b - c) = ab - ac$ $(b - c)a = ba - ca$	$3(2x + 1) = 6x + 3$ $(4x + 5)x = 4x^2 + 5x$ $-9(x - 8) = -9x + 72$ $(x^2 - 3)x = x^3 - 3x$
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Distribute

1. $3(x + 4)$	2. $(w + 6)4$	3. $5(y - 2)$	4. $(7 - m)8$
5. $-(y - 9)$	6. $(-2)(x + 6)$	7. $(2x - 4)(-3)$	8. $x(x + 1)$
9. $-9(a + 6)$	10. $4x(x + 8)$	11. $-2t(12 - t)$	12. $(3y - 2)5y$
13. $-2x(x - 8)$	14. $-9(-t - 3)$	15. $(6 - 3w)(-w^2)$	16. $-y(-y^2 + y)$

X. Find the Greatest Common Factor (GCF) of the following:

35) 36 and 40 _____ 36) 6, 12, and 21 _____

XI. Name all the possible factors:

37) 24 _____

38) 55 _____

XII. Statistics

Mr. Smith teaches two math classes. The table below shows the recent test scores for his students.

Class A	56	57	57	59	65	67	68	70	72	75	88	89	91	95	96	98	99
Class B	62	73	76	79	79	83	84	84	85	87	87	87	90	92	93	93	95

39) Calculate the mean, median and mode of each class separately.

Mean class A _____ Mean class B _____

Median class A _____ Median class B _____

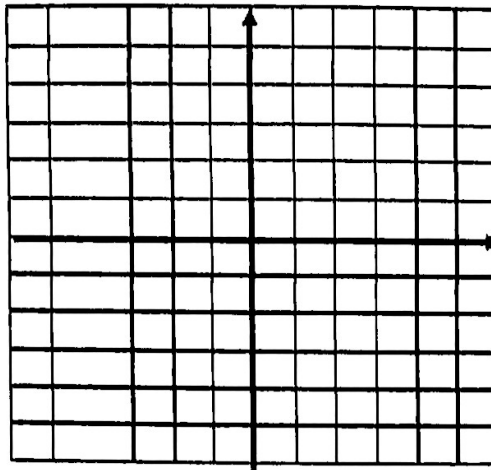
Mode class A _____ Mode class B _____

40) Overall which class did better on the test? Use mathematics to justify your answer. Be sure to give specific examples.

XIII. Graphing

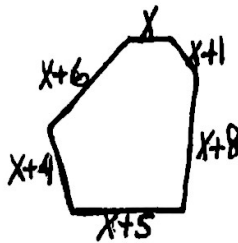
Plot each of the following points on the grid below. Use the letter to label the point on the graph.

- 41) A(3,0) B(5,5) C(-1,2) D(-3,-2) E(0,-3)



Answer in complete sentences where appropriate. Show all your work to receive full credit.

- 42) The perimeter of the figure below is equal to 150 cm.



- What is the length of the longest side of the polygon? Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation.

XIV. Number properties

43. Match the property with its correct name

1. $x + (y + z) = (x + y) + z$

2. $(pq) \cdot 1 = pq$

3. $(5x)y = 5(xy)$

4. $a + 5b = 5b + a$

5. $a + 0 = a$

6. $gh = hg$

7. $8 + (-8) = 0$

8. $x \cdot 0 = 0$

9. $5 \cdot \left(\frac{1}{5}\right) = 1$

10. $2(a + b) = 2a + 2b$

- a Additive Inverse Property
- b Multiplicative Inverse Property
- c Commutative Property of Multiplication
- d Multiplicative Identity
- e Commutative Property of Addition
- f Associative Property of Addition
- g Distributive Property
- h Associative Property of Multiplication
- i Additive Identity Property
- j Zero Property

Rules: ** If a number has no sign it means it is a positive number. **

Addition

SAME SIGNS

1) Add their absolute values.

2) Attach the common signs.

$$-4 + (-5) = -(4 + 5) = -9 \qquad 4 + 5 = 9$$

OPPOSITE SIGNS

1) Subtract the smaller absolute value from the larger absolute value.

2) Attach the sign of the number with the larger absolute value.

$$3 + (-9) = -(9 - 3) = -6 \qquad -3 + 9 = +(9 - 3) = 6$$

Subtraction

1) Adding the opposite of a number is equivalent to subtracting the number.

2) Change all problems to addition and follow the addition rules.

$$3 - 12 = 3 + (-12) = -(12 - 3) = -9$$

$$-7 - 1 = -7 + (-1) = -(7 + 1) = -8$$

$$-4 - (-10) = -4 + 10 = +(10 - 4) = 6$$

$$12 - (-8) = 12 + 8 = 20$$

NO CALCULATOR!

1. $7 + (-9) =$	2. $-12 + 15 =$
3. $2 - 4 =$	4. $12 - 19 =$
5. $-7 - (-5) =$	6. $7 + 27 =$
7. $-12 - (-4) =$	8. $0 - 8 =$
9. $0 - (-6) =$	10. $-8 - 2 =$
11. $-3 + 1 =$	12. $-7 + (-5) =$
13. $-9 - (-13) + (-4) =$	14. $-6 - 4 - (-8) =$
15. $25 - 21 + (-20) =$	16. $-39 - (-32) - 14 =$