Algebra 1 Summer Packet

The following practice will help you review topics from previous mathematics courses that are important for your success in Algebra 1.

There will be an assessment on these skills within the first five days of school. Use your notes from your previous mathematics courses to assist you.

Highlight any questions you may have as you will have an opportunity to discuss them during our first days of school. A helpful website with video tutorials is www.khanacademy.org. I will be reaching out to you throughout the summer!

Topic 1: Integer Operations

Adding & Subtracting Signed Numbers	
Same Signs:	Different Signs:
Add the numbers and carry the sign	Subtract the signs and take the sign of the bigger number
(+) +/- (+) = + (-) +/- (-) = -	(+) +/- (-) = - (-) +/- (+) = -

Find the sum or difference of each problem.

1. $9 + (-4)$
2. $-8 + 7$
3. $-14 - 6$
4. $-30 + (-9)$
5. $20 - (-6)$
6. $7 - 10$

Multiplying & Dividing Signed Numbers	
Same Signs:	Different Signs:
Always positive	Always negative
(+)(+) = + (-)(-) = +	(+)(-)= - (-)(+) = -

Find the product or quotient of each problem.

1. $(-5) \cdot (-3)$
2. $\frac{-7}{-1}$
3. $\frac{-6}{2}$
4. $(3)(-4)$
5. $(-1)(-5)$
6. $\frac{-20}{-1}$

Topic 2: Fraction Operations

Adding & Subtracting Fractions
1. Make sure the denominators are the same by using the least common denominator
2. Rewrite each fraction into its equivalent fractions with the denominator equal to the LCD
3. Add or subtract the numerators using signed number rules and keep the denominator as the LCD
4. Simplify

Find the sum or difference of each problem.

1. $\frac{3}{5} + \frac{1}{4}$
2. $\left(-\frac{2}{3}\right) - \frac{1}{2}$
3. $\frac{4}{5} - \frac{1}{2}$
4. $\left(-\frac{3}{5}\right) - \left(-\frac{1}{3}\right)$
5. $-\frac{7}{9} + \frac{2}{3}$
6. $\frac{7}{8} + \left(-\frac{2}{3}\right)$

Multiplying Fractions
1. Multiply numerators using signed number rules
2. Multiply denominators using signed number rules
3. Simplify

Find the product of each problem.

1. $\frac{1}{8} \cdot -\frac{2}{3}$
2. $\left(\frac{-1}{2}\right)\left(\frac{4}{5}\right)$
3. $\left(-\frac{3}{5}\right)\left(\frac{10}{-11}\right)$

Dividing Fractions
1. Find the reciprocal of the divisor (second fraction)
2. Multiply the dividend (first fraction) by the reciprocal of the divisor using signed number rules
3. Simplify

Find the quotient of each problem

1. $\frac{2}{3} \div \frac{5}{6}$
2. $-\frac{2}{5} \div \frac{1}{6}$
3. $\left(-\frac{3}{4}\right) \div \left(-\frac{1}{4}\right)$

Topic 3: Order of Operations

Order of Operations	
1.	Perform any operation(s) inside grouping symbols: parentheses ( ), brackets [ ] above or below a fraction bar
2.	Simply any term with exponents
3.	Multiply and divide in order from left to right →
4.	Add and subtract in order from left to right →

Evaluate each expression.

1. $6 + 4 - 2 \cdot 3$
2. $(-2) \cdot 3 - 5 + 7$
3. $15 \div 3 \cdot 5 - 4$
4. $29 - 3 \cdot 9 + 4 \cdot 2$
5. $3(2 + 7) - 9 \cdot 7$
6. $[10 + (2 \cdot 9)] \div 2$
7. $\frac{5 + [30 - (8 - 1)^2]}{11 - 2^2}$
8. $162 + [6(7 - 4)^2] \div 3$

Topic 4: Simplify Expressions

Term:	The parts of an algebraic expression that are separated by an addition or subtraction sign are called terms.
Like Terms:	Terms with the same variable factors are called like terms.
Simplify:	Expressions with no parenthesis and no like terms.

Simplify each expression.

1. $3n + 1 - 2n + 8$
2. $4f + 5f - 6 + 1$
3. $6x + 2x^2 - 5 + 4x$
4. $y + y + 1 + 1$

Topic 5: Algebraic Properties

Substitution Property	Replace the variables in an algebraic expressions with numeric or algebraic expressions

Evaluate each expression given that $x = 5, y = -4 \text{ and } z = 6.$

1. $2(x + z) - y$
2. $5x - (y + 2z)$

Commutative Property	The order in which two terms are multiplied or added does not change the product or sum

Using the terms $x \text{ and } 2$, create equivalent expressions using the given property.

1. Commutative Property of Addition:

2. Commutative Property of Multiplication:

Distributive Property	Multiply the number outside the parentheses by each term inside the parenthesis

Simplify the following expressions using the distributive property.

1. $2(x + 3)$
2. $4(y + 2)$
3. $6(4 - x)$

Topic 6: One-Step Equations

Inverse Operations:	Isolate the variable by doing the opposite operation
Properties of Equality:	To keep the equation equal, "whatever you do to one side, do to the other"

Solve each equation.

1. $x + 3 = 5$
2. $x - 5 = -8$
3. $4x = 12$
4. $\frac{x}{8} = 7$

Topic 7: Algebraic Translating

Add	Subtract	Multiply	Divide	Inequalities	Variable	Equal
Plus Sum Longer than Greater than Together Total Increased More than In all And	Decreased Smaller Less than Difference Reduced Differ Fewer Shorter than Minus Diminished	Per For every For each Triple (3) Multiplied Of Times Twice (2) Double (2)	One-third (3) Quotient Divided by Each part Half (2) Split equally	< is less than > is greater than ≤ is less than or equal to ≥ is greater than or equal to	A number Some number Quantity	Same as Equals Is Total Was Result Outcome Answer

Translate each phrase into a mathematical statement.

1. Seven plus five times a number is greater than or equal to -9

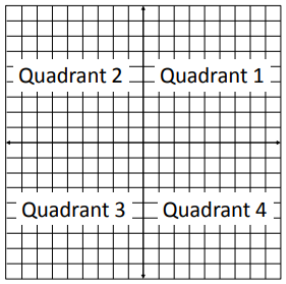
2. Eight times a number increased by 6 is 62

3. The sum of a number and eight is less than 2

4. 9 less than 7 times some number is -6

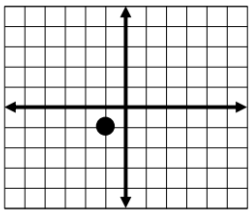
Topic 8: Coordinate Plane Graphing

Quadrant 1:	Positive x-coordinate and positive y-coordinate (+x, +y)
Quadrant 2:	Negative x-coordinate and positive y-coordinate (-x, +y)
Quadrant 3:	Negative x-coordinate and negative y-coordinate (-x, -y)
Quadrant 4:	Positive x-coordinate and negative y-coordinate (+x, -y)

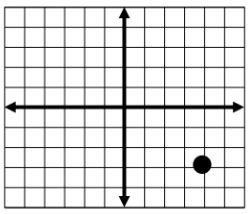


Determine the coordinates for each pair below.

1. (,)



2. (,)



3. (,)