

**Coventry High School  
Math Department**

**Algebra I Summer Packet  
2024 – 2025**

The problems in this packet are designed to help you review topics from middle school that are important for your success in Algebra 1. The topics covered in this packet should be addressed and reviewed before entering Algebra I. Examples have been provided in each section to help you get started and refresh your memory of these concepts.

It is advised that you do all of the work for each problem right on this packet.

**Your answers to the questions will be submitted online.**

***Go to the link below to submit your answers:***

<https://forms.gle/riAdaScUYNevaBwK6>

(numbers and upper/lowercase matter)

**\*\*\*Please note that you cannot submit your answers on the google form until the form opens on August 1, 2024.\*\*\***

This packet is due on the first day of school and will count as one of your first grades of the school year!

While it is not required, it is strongly recommended that students buy a calculator for their personal use throughout the school year. Although a scientific calculator is sufficient in this course, the purchase of a TI – 83 graphing calculator will be the calculator to use during your high school experience.

*Play hard, work hard, and enjoy your summer vacation!*

*See you at the opening of school*

## Part A - Fraction Operations

### Adding Fractions:

To add fractions you need a common denominator

$$\text{Ex: } \frac{4}{5} + \frac{5}{6} \rightarrow \frac{(6)4}{(6)5} + \frac{(5)5}{(5)6} \rightarrow \frac{24}{30} + \frac{25}{30} \rightarrow \boxed{\frac{49}{30}}$$

### Subtracting Fractions:

To subtract fractions you need a common denominator:

$$\text{Ex: } \frac{4}{5} - \frac{5}{6} \rightarrow \frac{(6)4}{(6)5} - \frac{(5)5}{(5)6} \rightarrow \frac{24}{30} - \frac{25}{30} \rightarrow \boxed{\frac{-1}{30}}$$

### Multiplying Fractions:

To multiply fractions you multiply the numerators and denominators (You do not need a common denominator):

$$\text{Ex: } \frac{5}{4} \cdot \frac{2}{7} \rightarrow \frac{10}{28} \rightarrow \boxed{\frac{5}{14}}$$

### Dividing Fractions:

To divide fractions you multiply the first fraction by the reciprocal of the second fraction:

$$\text{Ex: } \frac{5}{4} \div \frac{2}{7} \rightarrow \frac{5}{4} \cdot \frac{7}{2} \rightarrow \frac{5 \cdot 7}{4 \cdot 2} \rightarrow \boxed{\frac{35}{8}}$$

Helpful Links:

[www.purplemath.com/modules/fraction4.htm](http://www.purplemath.com/modules/fraction4.htm)

[www.purplemath.com/modules/fraction3.htm](http://www.purplemath.com/modules/fraction3.htm)

[www.khanacademy.org/math/arithmetic/fractions/dividing-fractions-tutorial](http://www.khanacademy.org/math/arithmetic/fractions/dividing-fractions-tutorial)

Solve the following equations. All answers must be written as a reduced fraction.

1.  $-\frac{3}{8} + \frac{9}{20} =$

2.  $\frac{9}{20} - \frac{3}{5} =$

3.  $9 \cdot \frac{3}{4}$

4.  $\frac{3}{8} \div \frac{7}{12}$

## Part B - Order of Operations

To simplify expressions, you need to follow the order of operations. To do so, make sure you simplify/evaluate:

- Parentheses or brackets first
- Exponents or square roots second
- Multiplication or division (whichever comes first, from left to right!)
- Addition or subtraction (whichever comes first, left to right!)

Ex:  $5 + 2 \cdot 3^2 - 13 \rightarrow 5 + 2 \cdot 9 - 13 \rightarrow 5 + 18 - 13 \rightarrow 23 - 13 \rightarrow 10$

Ex:  $(4^2 - 1) \div 3 \cdot 2 \rightarrow (16 - 1) \div 3 \cdot 2 \rightarrow 15 \div 3 \cdot 2 \rightarrow 5 \cdot 2 \rightarrow 10$

Simplify the following expressions (Using the Order of Operations):

1.  $8 + 7 \cdot 9$

2.  $12 + 4^2$

3.  $2(2 + 7) - 24 \div 12$

4.  $4(9 - 3) \div (8 - 2)$

5.  $26 - [(25 - 11) - 2^3]$

6.  $(8^2 - 2^5) \div (24 \div 6) + 3^2$

## Part C - Expressions and Equations

To simplify expressions, you need to combine like terms.

Examples of like terms are:  $-3y$ ,  $y$ ,  $12y$ .

Examples of unlike terms are:  $7y$ ,  $2x$ ,  $3$ ,  $10y^2$

Ex:  $5 + 3z - 2z - 3 \rightarrow 5 - 3 + 3z - 2z \rightarrow \boxed{2 + 1z}$

Helpful Links:

[www.purplemath.com/modules/polydefs2.htm](http://www.purplemath.com/modules/polydefs2.htm)

[www.khanacademy.org/math/algebra-basics/core-algebra-expressions](http://www.khanacademy.org/math/algebra-basics/core-algebra-expressions)

**Combine like terms to simplify each expression:**

1.  $5x + x$

2.  $-6y - 3y$

3.  $9x - 4x + -5x$

4.  $5y - 12y + -7y$

5.  $-6 - 4c - 3 - -2c + 1$

6.  $-4 - -6x^2 - 3x^2$

Helpful Links:

[www.purplemath.com/modules/solvein.htm](http://www.purplemath.com/modules/solvein.htm)

[www.purplemath.com/modules/solvein3.htm](http://www.purplemath.com/modules/solvein3.htm)

<https://www.khanacademy.org/math/algebra/one-variable-linear-equations>

To solve equations, first simplify both sides of the equation. If the equation contains fractions, multiply the equation by the LCD to clear the equation of fractions. Use the addition and subtraction properties of equality to get variables on one side and constants on the other side of the equal sign. Use multiplication and division properties of equality to solve for the variable.

Remember: Your goal is to get the variable by itself!

Ex:  $3x + 2x = 25 \rightarrow 5x = 25 \rightarrow \boxed{x = 5}$

**Solve each equation for the given variable:**

7.  $x - 5 = 36$

8.  $7 + 3y = -14$

9.  $8b + 2b = 10$

10.  $-2(m + 7) = -22$

11.  $4(w - 9) = 7w + 19$

12.  $1.5x - 1.2 = 1.8x$

## Part D - Evaluating Linear Expressions and Equations:

To evaluate, you need to substitute the value for a specific variable. Be sure to follow the order of operations:

Ex:  $-p + 3r - p^2$  when  $p = 2$ , and  $r = 5$

Ex:  $-2 + 3(5) - 5^2 \rightarrow -2 + 15 - 25 \rightarrow 13 - 25 \rightarrow -12$

Helpful Links:

[www.purplemath.com/modules/evaluate.htm](http://www.purplemath.com/modules/evaluate.htm)

[www.khanacademy.org/math/algebra/introduction-to-algebra/variable-and-expressions/e/evaluating\\_expressions\\_2](http://www.khanacademy.org/math/algebra/introduction-to-algebra/variable-and-expressions/e/evaluating_expressions_2)

**Evaluate each expression using the values given:**

1.  $a + 3^3 - (b - a)$  when  $a = 1$ , and  $b = 6$

2.  $x + x(x + y) + y$  when  $x = 4$  and  $y = 1$

1. Read problem carefully and figure out what are you being asked to find.
2. Assign a variable to quantify what you are trying to find.
3. Write an equation for the quantities given in the problem.
4. Solve the equation.
5. Answer the question in the problem.
6. Check your work.

Ex: Domino's charges \$5 for a pizza, plus an additional 25 cents per topping. How much would a pizza cost if you order 10 toppings? (Please don't order a pizza with ten toppings!)

$c =$  total cost

$$c = .25h + 5 \rightarrow c = .25(10) + 5 \rightarrow c = 2.50 + 5 \rightarrow c = 7.50$$

$h =$  number of toppings

A pizza with ten toppings would cost \$7.50.

**Write an equation to model the following scenarios. Then evaluate.**

3. For babysitting, Nicole charges a flat fee of \$3, plus \$5 per hour. a) Write an equation for the cost,  $C$ , after  $h$  hours of babysitting. b) How much money will she make if she baby-sits 5 hours?

4. A plumber charges \$25 for a service call plus \$50 per hour of service. a) Write an equation in slope-intercept form for the cost,  $C$ , after  $h$  hours of service. b) What will be the total cost for 8 hours of work? 10 hours of work?

## Part E - Linear Equations

The equation of a line is written in the form  $y = mx + b$ , where  $m$  is the slope and  $b$  is the  $y$ -intercept.

Example:

$$y = -3x - 8$$

$$m = -3$$

$$b = -8$$

Helpful Links:

[www.purplemath.com/modules/slopyint.htm](http://www.purplemath.com/modules/slopyint.htm)

For each Linear Equation, find the slope ( $m$ ) and the  $y$ -intercept ( $b$ ).

1.  $y = 4x + 2$        $m =$  \_\_\_\_\_       $b =$  \_\_\_\_\_

2.  $y = -x + 6$        $m =$  \_\_\_\_\_       $b =$  \_\_\_\_\_

3.  $y = \frac{3}{4}x - 2$        $m =$  \_\_\_\_\_       $b =$  \_\_\_\_\_

4.  $y = -\frac{1}{2}x + 5$        $m =$  \_\_\_\_\_       $b =$  \_\_\_\_\_