GUIDELINES FOR COMPLETING THE ASSIGNMENT

This packet was created to help you succeed in your upcoming Algebra 2 class. Many of the concepts covered in this packet were taught to you in previous classes. In your upcoming math class we will be building on the concepts covered in this packet.

You may find that you have forgotten some of these concepts. There are many resources available to you on the internet to refresh your memory. If you are still confused, be sure to take the time to ask for the help needed to complete them.

For each of the questions make sure you show all relevant work so you can receive full credit.

This packet will count as two grades toward your first marking period grade.

The packet will be graded for completeness and accuracy. Your teacher will be looking for supporting work to see that you understand each concept. This will be a homework grade.

You will be given an assessment on the materials with in this packet to check for understanding.

Supplies needed for your first day of class and every day after:

- 1 Subject Notebook
- Folder
- Pencils/Erasers

RESOURCE — CONTACT A TEACHER

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Have a great summer!
INSTRUCTIONS

- All of your work must be on separate paper.
- The numbers do not go in order, so be sure to LABEL your work based on the page and section you are working on.
- Write your answers on the pages of this packet.
- You will hand in this packet, as well as the work that you showed on separate paper.
- There will be a test on this material sometime during the first few weeks of school. Don’t just do this to get it done, take it seriously and be sure to learn the concepts.
- It would also be in your best interest to make sure you know your multiplication facts and integer rules.
PAGE 1: Part A – No work on separate paper needed.

Graph each linear equation.

13. \( y = \frac{2}{3}x + 4 \)  
14. \( y = \frac{4}{5}x \)  
15. \( y = 3x + 2 \)

PAGE 1: Part B – Show any work on separate paper.

13. \( y = -4 - x + 1 \)  
14. \( y - 5 = x + 1 \)  
15. \( y + 4 = x - 2 \)

PAGE 1: Part C – Show any work on separate paper, write answers on this page.

6. A teen night club charges $5.00 for admission and $1.50 for a soft drink.

a. Write a linear equation that relates the total cost, \( C \), in terms of the number of soft drinks, \( d \).

\[ C = 5 + 1.5d \]

b. What is the total cost if 3 soft drinks are purchased?

\( C = 5 + 1.5(3) = 9.50 \)

c. How many soft drinks are purchased if the total cost is $12.50?

\( 12.50 = 5 + 1.5d \)
\( 7.50 = 1.5d \)
\( d = 5 \)
SYSTEMS OF EQUATIONS

**Solving by Substitution:** This method is important to learn because it will be the best method when having to solve a system with more than two variables.

\[
\begin{align*}
2x + y &= 3 \quad \rightarrow \quad 2x + 1y &= 3 \\
3x - 2y &= 8
\end{align*}
\]

\[
3x - 2(3 - 2x) = 8
\]

\[
3x - 6 + 4x = 8
\]

\[
7x - 6 = 8
+ 6 + 6
\]

\[
7x = 14
\]

\[
x = 2
\]

\[
y = 3 - 2(2)
\]

\[
y = -1
\]

\[\boxed{(2, -1)}\]

**To solve a system using substitution:**

- Solve one equation for a variable (make a smart choice)
- Substitute into the other equation and solve it.
- Substitute your known value into either equation to find the second value.
- Display your answer as a coordinate pair.

**The Elimination Method:** The elimination method involves adding the equations together in order to eliminate one of the variables.

In order to eliminate a variable you need opposite terms.

\[
\begin{align*}
2x + 3y &= 20 \\
-2x + 2y &= 10
\end{align*}
\]

\[
5y = 30
\]

\[
y = 6
\]

\[
2x + 3y = 20
\]

\[
2x + 3(6) = 20
\]

\[
2x + 18 = 20
\]

\[
x = 1
\]

\[\boxed{(1, 6)}\]

- If there are already opposite terms, add the equations
- Solve for the remaining variable
- Substitute the found value into one of the original equations to find the value of the second variable.
- Write your solution as a coordinate pair.
Multiplying Both Equations:

\[
\begin{align*}
\begin{cases}
4x + 5y &= 35 \\
-3x + 2y &= -9
\end{cases}
\end{align*}
\]

\[
\begin{align*}
12x + 15y &= 105 \\
-12x + 8y &= -36
\end{align*}
\]

\[
\frac{23y}{23} = 3
\]

\[
\frac{23}{23} = \frac{3}{1}
\]

\[
y = 3
\]

\[
\begin{align*}
4x + 5y &= 35 \\
4x + 5y &= 35
\end{align*}
\]

\[
\begin{align*}
4x + 18 &= -2.5 \\
18 &= -18
\end{align*}
\]

\[
\begin{align*}
4x &= -20 \\
\frac{4x}{4} &= \frac{-20}{4}
\end{align*}
\]

\[
x = 5
\]

Sometimes you will need to multiply both equations by a constant to create opposites.

We could multiply the top equation by 3 and the bottom equation by 4. The x-terms will then be 12x and -12x. How would we make opposites with the y-terms?

\[
\text{Multiply the top by 2.}
\]

\[
\text{and the bottom by -3.}
\]

\[
(5, 3)
\]

Part B - PROBLEMS TO BE COMPLETED

Solve:

21) \[
\begin{align*}
y &= 3x + 9 \\
y + 2x &= 4
\end{align*}
\]

22) \[
\begin{align*}
y &= x - 3 \\
y &= 5 - 3x
\end{align*}
\]

23) \[
\begin{align*}
4x + 2y &= 6 \\
3x - 2y &= 8
\end{align*}
\]

24) \[
\begin{align*}
3x + 4y &= -6 \\
2y &= 3x + 6
\end{align*}
\]
Simplifying Expressions With Like Terms

Key Vocabulary:

A **term** is a single number or variable, or the product or quotient of a number and one or more variables. For example:

\[
3 \quad 3x^2 \quad 5xyz \quad \frac{2xy}{3ab}
\]

An **expression** is one or more terms being added or subtracted together. For example:

\[
3x + 2 \quad 5x^2 + 2x - 8
\]

**Like terms** are terms that have the same combination of variables.

- \(3x\) and \(4x\)
- \(2y\) and \(-6y\)
- \(10ab\) and \(2ab\)
- \(3xy\) and \(4yx\) (these are like terms because multiplication is **Commutative** [look it up!])

The **coefficient** is the number being multiplied by the variable or variables. In the term \(5x\), 5 is the coefficient. If there appears to be no coefficient, like in the term "\(x\)", the coefficient is 1.

How to simplify expressions with like terms:

To combine like terms, we simply add the coefficients. Please see the example below and model your work after it.

\[
3x + 2y + 9y - 7y
\]

First we can re-order the terms so that like terms appear next to each other. Be sure to move the sign to the left of the term with the term. For example, we are moving \(-7y\), not just \(7y\).

\[
3x + 9x + 2y - 7y
\]

Now we can simplify the \(x\) terms by adding 3 and 9

\[
12x + 2y - 7y
\]

Then we should add 2 and \(-7\) to simplify the \(y\) terms.

\[
12x - 5y
\]

Once there are no more like terms in our expression, it is simplified.
1) \(-5x + 2y - 7y - 3x\) 
2) \(5a + 4a - 2b + 7a\) 

3) \(150x - 50x\) 
4) \(2xy - 6xy\) 

5) \(25ab + 50ba\) 
6) \(-6d + 7d\) 

7) \(-5x + x + x + x\) 
8) \(2x + 5a - 2x + 5a\) 

9) \(4a - a\) 
10) \(12r + 5 + 3r - 4\) 

11) \(-3x - 9 + 15x\) 
12) \(12r - 8 - 12\) 

13) \(-7n - 21 + 5n + 4\) 
14) \(2ab + 3xy - 5ab + 4x\) 

15) \(3x + 4y - 8xy\) 
16) \(-5n + 18 - 7n\) 

17) \(10 - 45j + 5\) 
18) \(-2x + 11 + 6x\) 

19) \(-6x + 5y - 3y + 10x\) 
20) \(11r - 12r\)