GUIDELINES FOR COMPLETING THE ASSIGNMENT

This packet was created to help you succeed in your upcoming Geometry 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. We have taken the time to provide you with step by step instructions within the packet. 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. 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.

Have a great summer!

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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Graphing With Coordinates

The coordinate plane is something we will see a lot of this year. It is very important that you know how to plot points, and how to identify points that are given.

(2,6) is called a coordinate pair. A coordinate pair is simply a location of a point on the plane. The first number is always the x-coordinate (how far left or right from the origin) and the second number is always the y-coordinate (how far up or down from the origin).

If I was asked to plot the point (2,6) I would move my pencil right two units to the right along the x-axis and then 6 units up from there and draw a bold point. (I have done so on the diagram to the left)

Write the coordinate pair for each point listed below, and state which quadrant it is in (I,II,III or IV)

F:
G:
H:
M:
P:
R:

Plot the following points on the provided coordinate plane. Be sure to label the points.

A  (1, 3) (example shown)
B  (-5, 2)
C  (-4, -2)
D  (3, -4)
E  (-3, -3)
F  (3, 5)
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:

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

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

\[
3x + 2 \quad 5x^2 + 2x - 6
\]

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

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

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.

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

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 \(7y\).

\[
\frac{3x + 9x + 2y - 7y}{12x + 2y - 7y}
\]

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.
Simplify the following expressions. If it cannot be simplified, copy the problem and circle it as your answer.

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) \(11r - 12r\)
**Solving Single and Two Step Equations:**

In solving equations, you want to get the variable, or the letter, by itself. In order to do that you must eliminate the value on the same side of the variable by adding or subtracting that number from both sides of the equal sign, and then by multiplying or dividing by the coefficient, or number, in front of the variable.

Examples:

1. \( x + 5 = 8 \)
   
   Notice that the 5 needs to be eliminated in order to get the variable alone
   
   \(-5\) \(-5\)
   
   Subtract 5 from both sides of the equal sign so that it lines up under the values
   
   \( x = 3 \)
   
   & will eliminate on the variable side

2. \( \frac{x}{4} = 6 \)
   
   Multiply 4 on both sides, so that it will cancel on the variable side
   
   \(*4\) \(*4\)
   
   \( x = 24 \)

3. \( 2x - 5 = 11 \)
   
   In two-step equation, you need to first eliminate the constant, or number by itself
   
   \(+5\) \(+5\)
   
   First add 5 to both sides, so that it will eliminate on the variable side
   
   \( 2x = 16 \)
   
   You are then left with a simple one step equation to solve by multiplying or dividing
   
   \( \frac{2x}{2} = \frac{16}{2} \)
   
   Divide 2 from both sides, so that it will eliminate on the variable side
   
   \( x = 8 \)

4. \( \frac{x}{2} + 3 = 7 \)
   
   First subtract 3 from both sides, so that it will eliminate on the variable side
   
   \(-3\) \(-3\)
   
   \( \frac{x}{2} = 4 \)
   
   \(*2\) \(*2\)
   
   Multiply 2 on both sides, so that it will eliminate on the variable side
   
   \( x = 8 \)
Solve the following examples: Be sure to show all work similar to the ones above.

1. $5 - x = 3$

2. $\frac{x}{6} = 7$

3. $3x = -15$

4. $x + 6 = 14$

5. $\frac{x}{7} = 12$

6. $x - 12 = 54$

7. $12x = 144$

8. $15 - x = 32$

9. $32 = 8x$

10. $98 = -12 + x$
11. \( \frac{6x}{5} + 8 = -2 \)

12. \(-2 - 14z = -30\)

13. \(-51 = 8x + 5\)

14. \(4a - 2 = 30\)

15. \(\frac{x}{6} - 17 = -25\)

16. \(8 - 2n = -4\)

17. \(7y - 1 = 27\)

18. \(\frac{3x}{4} + 9 = 9\)

19. \(36 = 3m + 6\)

20. \(\frac{151 + r}{3} = 80\)
I.1 The Building Blocks of Geometry

**Skill A** Identifying and naming points, lines, and planes

Recall The undefined terms *point*, *line*, and *plane* represent geometric figures. Such figures do not exist in the real world, but may be represented by real-world objects or by drawings.

A point has no size. It may be represented by a dot and named with a single capital letter.

A line extends forever in both directions, but has no thickness. A line is named using either the names of two points on the line or a single lower-case letter. Points that lie on the same line are called collinear. Any two points are collinear.

A plane is like a flat surface that extends forever in all directions but has no thickness. A plane is named using either the names of three points that lie in the plane and are not collinear, or by a single script capital letter. Points that lie in the same plane are coplanar. Any three points are coplanar.

**Example**
Name each figure.

- a. \( \bullet P \)
- b. \( \overrightarrow{ij} \)
- c. \( \triangle NMP \) or \( \square R \)

**Solution**

- a. point \( P \)
- b. \( \overrightarrow{ij}, \overrightarrow{jk}, \) or line \( m \)
- c. plane \( MNP \) or plane \( R \)

Name the indicated figures in the drawing at the right.

1. two lines ____________________________
2. two planes ____________________________
3. three noncollinear points ____________________________
4. four noncoplanar points ____________________________

**Skill B** Identifying and naming segments, rays, and angles

Recall A segment is a part of a line that consists of two points, called the endpoints, and all the points between them. The segment with endpoints \( X \) and \( Y \) is denoted \( XY \).

A ray is a part of a line that has one endpoint and extends without end in one direction. The ray that has endpoint \( A \) and contains point \( B \) is denoted \( \overrightarrow{AB} \).

An angle is a figure formed by two rays that do not lie on the same line, but have the same endpoint. The common endpoint is the vertex of the angle. The angle in the figure at the right may be referred to as \( \angle PQR, \angle RQP, \angle 1, \) or \( \angle Q \). If two angles have the same vertex, they must be named using numbers or three letters.
**Example**
Name each figure.
- a. \( \overline{MZ} \) or \( \overline{ZM} \)
- b. \( \overline{EH} \)
- c. \( \angle JRB, \angle RBJ, \) or \( \angle B \)

**Solution**
- a. \( \overline{MZ} \) or \( \overline{ZM} \)
- b. \( \overline{EH} \)
- c. \( \angle JRB, \angle RBJ, \) or \( \angle B \)

Refer to the figure at the right.

5. Name all the segments. ____________________________________________

6. Name four rays with endpoint \( T \). ______________________________________

7. Give two other names for \( \angle 1 \). __________________________________________

8. Name the rays that form the sides of \( \angle 2 \). ______________________________________

**Skill C** Classifying and identifying intersections of geometric figures

Recall
- The postulates that follow are fundamental geometric ideas.
- The intersection of two lines is a point.
- The intersection of two planes is a line.
- Through any two points, there is exactly one line.
- Through any three noncollinear points, there is exactly one plane.
- If two points are in a plane, then the line containing them is in the plane.

**Example**
Name each of the following.
- a. the intersection of \( \overrightarrow{AB} \) and line \( k \)
- b. the intersection of planes \( \mathcal{K} \) and \( CDF \)
- c. the line containing points \( A \) and \( D \)
- d. all the planes shown that contain \( \overrightarrow{BE} \)

**Solution**
- a. point \( A \)
- b. \( \overrightarrow{DF} \)
- c. \( \overrightarrow{AD} \) (line \( k \))
- d. plane \( ABE \) and plane \( BEF \)

Refer to the figure at the right. Name each of the following.

9. the intersection of \( \overline{BC} \) and \( \overline{CD} \) ______________________________

10. a plane containing points \( D \) and \( G \) ______________________________

11. the intersection of planes \( P \) and \( M \) ______________________________

12. the line containing points \( F \) and \( E \) ______________________________
For Exercises 1–4, refer to the triangle at right.

1. Name all the segments in the triangle.

2. Name each of the angles in the triangle by using three different methods.

3. Name the rays that form each of the angles of the triangle.

4. Name the plane that contains the triangle.

State whether each object could best be modeled by a point, line, or plane.

5. a star

6. a notebook cover

7. a ruler edge

8. the tip of a pen

9. a sheet of paper

10. a letter opener

Classify each statement as true or false, and explain your reasoning in each false case.

11. Two planes intersect in only one point.

12. A ray starts at one point on a line and goes on forever.

13. The intersection of two planes is one line.

For Exercises 14–18, \( T \) is the midpoint of \( BC \). Classify each statement as true or false.

14. \( C, T, \) and \( B \) are collinear.

15. \( RS \) is the same as \( \overrightarrow{RT} \).

16. \( C, T, \) and \( B \) name a plane.

17. \( R, T, \) and \( C \) are collinear.

18. Four rays start at \( T \).