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.

On Friday September 12th 2014, the summer packet will be due.

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:

- 3 Ring Binder
- Filler Paper
- Pencils/Erasers

RESOURCE — CONTACT A TEACHER

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Have a great summer!
Graph each linear equation.

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

5. Describe the graph of \( y = mx + b \) when \( b = 0 \).

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, \( d \). 

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

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

Write the equation in slope-intercept form for the line that has the indicated slope, \( m \), and \( y \)-intercept, \( b \).

1. \( m = 2, \ b = -5 \)  
2. \( m = 3, \ b = 1 \)  
3. \( m = -4, \ b = 3 \)  

Using the slope formula, find the slope of the two points. 

If you're given two points \((x_1, y_1)\) and \((x_2, y_2)\)

\[ m = \frac{y_2 - y_1}{x_2 - x_1} \]

9. (2, 6) and (1, 5)  
10. (−1, −5) and (2, 4)

Identify the slope, \( m \), and the \( y \)-intercept, \( b \), for each line.

11. \( 3x + 4y = 6 \)  
12. \( \frac{3}{4}x + 2y = -3 \)

13. \( -2x - y = 4 \)  
14. \( 15x + 5y = -35 \)
Slope-Intercept Form

\[ y = mx + b \]

\[ \uparrow \quad \uparrow \]

slope \quad y\text{-intercept}

Write the slope-intercept form of the equation of each line.

1) \( 3x - 2y = -16 \)  
2) \( 13x - 11y = -12 \)

3) \( 9x - 7y = -7 \)  
4) \( x - 3y = 6 \)
Reteaching

1.1 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 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 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.

\[ \begin{array}{ccc}
\text{a.}\ 
\bullet P \\
\text{b.} \\
\text{c.} \\
\end{array} \]

◆ Solution

\[ \begin{array}{ccc}
\text{a. point } P \\
\text{b. } \overrightarrow{JK}, \overrightarrow{KL}, \text{ or line } m \\
\text{c. plane } MNP \text{ or plane } \\
\end{array} \]

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 \( \overline{XY} \).

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 \( \angle PQR, \angle RQP, \angle I, \) 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. \( \overrightarrow{EH} \)

c. \( \angle JBR, \angle RBH \), or \( \angle B \)

**Solution**

a. \( \overline{MZ} \) or \( \overline{ZM} \)

b. \( \overrightarrow{EH} \)

c. \( \angle JBR, \angle RBH \), 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 \( N \) 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 \( \overrightarrow{BC} \) and \( \overrightarrow{CG} \)

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

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

12. the line containing points \( F \) and \( E \)
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 RT. 

16. C, T, and B name a plane. 

17. R, T, and C are collinear. 

18. Four rays start at T.
Reteaching

1.2 Measuring Length

◆ Skill A  Finding the length of a segment on a number line

Recall  If \( x \) and \( y \) are the coordinates of points \( X \) and \( Y \) on a number line, then \( \overline{XY} \), the length of \( \overline{XY} \), is given by \( |x - y| \) or \( |y - x| \).

Notice that the length of \( \overline{XY} \) is also the distance between \( X \) and \( Y \).

◆ Example

Find the length of each segment on the number line.

\[
\begin{array}{ccc}
P & Q & R \\
-7 & -6 & -5 & -4 & -3 & -2 & -1 & 0 & 1 & 2 & 3 \\
\end{array}
\]

a. \( \overline{PR} \)  b. \( \overline{PQ} \)  c. \( \overline{QR} \)

◆ Solution

a. The coordinates of \( P \) and \( R \) are \(-7\) and \( 3 \). Thus, \( \overline{PR} = |3 - (-7)| = |10| = 10 \).

b. The coordinates of \( P \) and \( Q \) are \(-7\) and \(-1\). Thus, \( \overline{PQ} = | -1 - (-7)| = |6| = 6 \).

c. The coordinates of \( Q \) and \( R \) are \(-1\) and \( 3 \). Thus, \( \overline{QR} = |3 - (-1)| = |4| = 4 \).

In Exercises 1–6, use the number line below. Find the length of each line segment.

\[
\begin{array}{cccccccc}
L & B & G & D & C & M & A & E & F \\
-6 & -5 & -4 & -3 & -2 & -1 & 0 & 1 & 2 & 3 & 4 & 5 & 6 & 7 \\
\end{array}
\]

1. \( \overline{DA} \)  2. \( \overline{MB} \)  3. \( \overline{CE} \)

4. \( \overline{CM} \)  5. \( \overline{AC} \)  6. \( \overline{CF} \)

◆ Skill B  Using the Segment Congruence Postulate to identify and measure congruent segments

Recall  The Segment Congruence Postulate states that if two segments have the same length, they are congruent. If two segments are congruent, they have the same length.

In illustrations, congruent segments are indicated by equal numbers of “tick marks.” In the figure at the right, for example, \( \overline{XY} \) and \( \overline{XZ} \) are congruent. You write this as, \( \overline{XY} \cong \overline{XZ} \).

◆ Example

Use the Segment Congruence Postulate to complete each sentence.

a. If \( \overline{DE} = \overline{MN} \), then \_________.  b. If \( \overline{DE} \cong \overline{MN} \), then \_________.

◆ Solution

a. If \( \overline{DE} = \overline{MN} \), then \( \overline{DE} = \overline{MN} \).

b. If \( \overline{DE} \cong \overline{MN} \), then \( \overline{DE} = \overline{MN} \).
Name all congruent segments.

7. [Diagram of a quadrilateral with vertices A, B, C, and D]

8. [Diagram of a pentagon with vertices Q, R, S, T, and U]

9. [Diagram of a triangle with vertices K, L, and M]

10. In Exercise 9, if JK = 27, what else can you determine? ________________________

**Skill C** Using the Segment Addition Postulate to solve problems

**Recall**
The Segment Addition Postulate states that if A, B, and C are collinear with B between A and C, then \( AB + BC = AC \)

**Example**
Acadia, Brentwood, and Cedarville lie along a straight stretch of interstate highway. Brentwood lies between Acadia and Cedarville. The distance from Acadia to Cedarville is 200 miles. If Cedarville is three times as far from Brentwood as Brentwood is from Acadia, find each distance.

**Solution**
Let points A, B, and C represent Acadia, Brentwood, and Cedarville.
Let \( x \) be the distance in miles from Acadia to Brentwood.
Then \( 3x \) is the distance in miles from Brentwood to Cedarville.
Point B is between points A and C, and \( AC = 200 \).

\[
AB + BC = AC \quad \Rightarrow \quad x + 3x = 200
\]

\[
4x = 200
\]

\[
x = 50
\]

distance from Acadia to Brentwood = \( x = 50 \) miles
distance from Brentwood to Cedarville = \( 3x = 150 \) miles

**Check**: \( 50 + 150 = 200 \), which is the distance from Acadia to Cedarville.

In Exercises 11–14, point B is between points A and C. Find the indicated value.

11. If \( AC = 22 \), \( AB = x \), and \( BC = x + 6 \), find \( x \). ________________________

12. If \( AB = 6x - 2 \), \( BC = 2x + 1 \), and \( AC = 4 \), find \( AB \). ________________________

In Exercises 1–4, find the segment lengths determined by the points on the number line.

1. \( RV = \) ________________________

2. \( TX = \) ________________________

3. \( SW = \) ________________________

4. \( VW = \) ________________________
Reteaching

1.3 Measuring Angles

◆ Skill A  Measuring angles with a protractor

Recall  A protractor is a type of geometry ruler used to find the measure of an angle. If the vertex of \( \angle ABC \) is placed at the center point of a protractor and \( \overrightarrow{BA} \) and \( \overrightarrow{BC} \) intersect the protractor at \( a \) and \( b \), respectively, then the measure of \( \angle ABC \), written \( m \angle ABC \), is \( |a - b| \) or \( |b - a| \).

◆ Example  
Use a protractor to find the measure of \( \angle XYZ \).

◆ Solution  
1. Put the center of the protractor at \( Y \), the vertex of the angle.
2. Position the protractor so that \( \overrightarrow{YZ} \) passes through point \( O \).
3. Find the intersection point for \( \overrightarrow{YX} \), \( 36 \). 
   \[ m \angle XYZ = |36 - 0| = 36^\circ \]

◆ Skill B  Using the Angle Addition Postulate

Recall  The Angle Congruence Postulate: If two angles have the same measure, then they are congruent. If two angles are congruent, then they have the same measure.

In the figure at the right, \( m \angle A = m \angle B \), so \( \angle A \) and \( \angle B \) are congruent. This may be written \( \angle A \cong \angle B \). The “tick marks” indicate that the angles are congruent.

The Angle Addition Postulate: If a point \( S \) is in the interior of \( \angle PQR \), then \( m \angle PQS + m \angle SQR = m \angle PQR \).
**Example**

In the figure, $\angle MNQ = 104^\circ$ and $\angle QNP = 31^\circ$.
Find $m\angle MNP$.

**Solution**

by the Angle Addition Postulate,

$m\angle MNP = m\angle MNQ + m\angle QNP = 104^\circ + 31^\circ = 135^\circ$.

Find the missing angle measures.

3. $m\angle JKL = 41^\circ$, $m\angle LKM = 37^\circ$, $m\angle JKM = \ldots$

4. $m\angle JKL = 73^\circ$, $m\angle LKM = 29^\circ$, $m\angle JKM = \ldots$

5. $m\angle JKM = 83^\circ$, $m\angle JKL = 26^\circ$, $m\angle LKM = \ldots$

**Skill C**

Identifying and using special pairs of angles

Recall

Two angles are **complementary** if the sum of their measures is $90^\circ$. Each is called a **complement** of the other.

Two angles are **supplementary** if the sum of their measures is $180^\circ$. Each is called a **supplement** of the other.

If the endpoint of a ray is on a line so that two angles are formed, the angles are called a **linear pair**. In the figure, $\angle 1$ and $\angle 2$ form a linear pair. By the **Linear Pair Property**, the angles in a linear pair are supplementary.

Angles may be classified according to their measures.

A **right angle** has measure $90^\circ$.

An **acute angle** has measure between $0^\circ$ and $90^\circ$.

An **obtuse angle** has measure between $90^\circ$ and $180^\circ$.

**Example**

Identify any pairs of complementary angles or supplementary angles.

$\angle W + \angle X = 125^\circ + 55^\circ = 180^\circ$, so $\angle W$ and $\angle X$ are supplementary angles.

$\angle X + \angle Y = 55^\circ + 35^\circ = 90^\circ$, so $\angle X$ and $\angle Y$ are complementary angles.

**Solution**

Refer to the figure at the right. Complete each statement.

6. $\angle EDE$ and $\angle \ldots$ form a linear pair.

7. $\angle \ldots$ and $\angle A$ are supplementary angles.

8. $\angle \ldots$ and $\angle B$ are complementary angles.
Practice

I.3 Measuring Angles

Find the measure of each angle in the diagram at right.

1. \( \angle SVR \)
2. \( \angle SVQ \)
3. \( \angle SVP \)
4. \( \angle RVQ \)
5. \( \angle PVR \)

6. Name all sets of congruent angles in the diagram below.

Find the missing angle measures.

7. \( \angle BTE = 40^\circ \), \( \angle ETM = 60^\circ \), \( \angle BTM = \) 
8. \( \angle BTE = 112^\circ \), \( \angle ETM = \) , \( \angle BTM = 168^\circ \)
9. \( \angle BTE = \) , \( \angle ETM = 47^\circ \), \( \angle BTM = 92^\circ \)

In the figure at right, \( \angle CED = 39^\circ \), \( \angle CEL = (3x - 6)^\circ \), and \( \angle LED = (x + 25)^\circ \).

10. What is the value of \( x \)?
11. What is \( \angle CEL \)?

In the diagram at right, \( \angle DSF = (45 + x)^\circ \). Find the value of \( x \), and then give each indicated angle measure.

12. \( \angle DSF \)
13. \( \angle DSE \)
14. \( \angle ESF \)