Learning Guide Module

|		
Subject Code	Math 3	Mathematics 3
Module Code	1.0	Basic Plane and Coordinate Geometry
Lesson Code	1.1.2	Basic Geometric Terms and Notations 2
Time Limit		30 minutes

NAVIGATE

Time Allocation: 20 minutes
Actual Time Allocation: _____ minutes

It's your time to work on these questions. Do as indicated.

A. Determine if the following statements are **ALWAYS, SOMETIMES,** or **NEVER TRUE.**
    1. For $\angle ABC$, C is the vertex.
    2. A line has length and width.
    3. A point has length and width.
    4. Three distinct points are collinear.
    5. Three distinct points are coplanar.
    6. $\overrightarrow{AB}$ could be read as "ray AB" or "ray BA.
    7. Two angles add up to be less than 90°.
    8. $\overleftrightarrow{CD}$ could be read as "line CD" or "line DC".
    9. An acute triangle is an isosceles triangle.
    10. Three non-collinear points determine a plane.
    11. An isosceles triangle is an equilateral triangle.
    12. The acute angles of a right triangle have a sum of 90°.
    13. A triangle could have a right angle and an obtuse angle.
    14. A line is composed of two rays with a common endpoint.
    15. A line segment is composed of infinitely many points between two endpoints.

B. Name the line in the figure below in four ways.
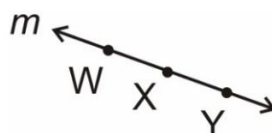
(Image from: Dillinger, B. (2011). *Chapter 1- Foundation of Geometry.* CK-12 Foundation Inc.)

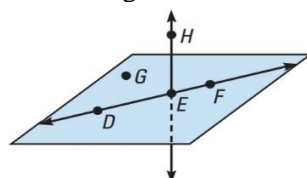C. Answer the following questions about the figure below.

Figure 3. Identifying collinear and coplanar points
(Image from: Larson, R. Bowell, L. & Stiff, L. (2004). *Geometry.* McDougal Littell, a division of Houghton Mifflin Company)

    1. Name three points that are collinear.
    2. Name four points that are coplanar.
   3. Name three points that are not collinear

D. Answer the following questions about the figure below.
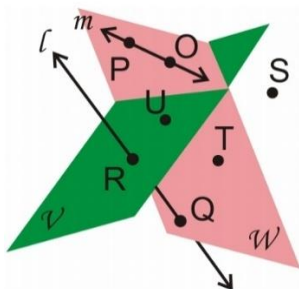
(Image from: Dillinger, B. (2011). *Chapter 1- Foundation of Geometry.* CK-12 Foundation Inc.)

1. How do Planes *W* and *V* intersect?
2. To which plane, V or W, is line *m* coplanar with?
3. Are points P, *O,* and *S* collinear?
4. Which point is non-coplanar with either plane?

E. Use the following information: B is in the interior of $\angle AFC$. C is in the interior of $\angle BFD$. D is in the interior of $\angle CFE$. C is in the interior of $\angle AFE$ and $m\angle AFE = 150°, m\angle CFE = 70°$, and $m\angle AFB = m\angle BFC = m\angle DFE$.
1. Find $m\angle BFD$
2. Find $m\angle BFE$
3. Find $m\angle AFB$
4. Find $m\angle CFD$
5. Find $m\angle AFD$

F. Solve for the value of x.

1.   2.   3.
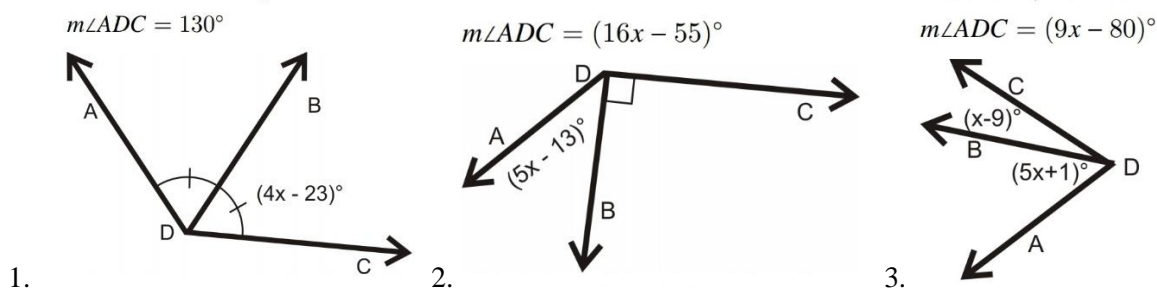
(Image from: Dillinger, B. (2011). *Chapter 1- Foundation of Geometry.* CK-12 Foundation Inc.)

G. Classify each triangle by its angles and its sides.
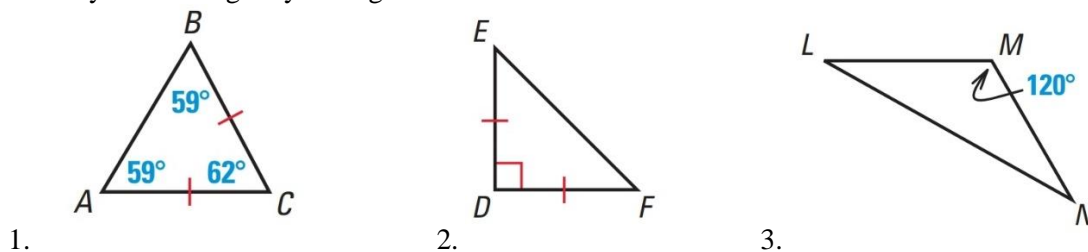
1.   2.   3.

(Image from: Larson, R. Bowell, L. & Stiff, L. (2004). *Geometry.* McDougal Littell, a division of Houghton Mifflin Company.)

H. **Error Analysis**: Avi is looking at a geometric figure and trying to determine which angles are congruent. He wrote $\angle ABC = \angle DBC$, in which D is in the interior or $\angle ABC$. Is this correct? Why or why not?

I. **Error Analysis:** Refer to the figure below. Camille said that $\angle ADC$ and $\angle BDC$ are adjacent angles since their common vertex is D and their common side is $\overrightarrow{DC}$. Is she correct? Why or why not?
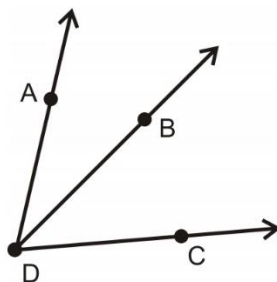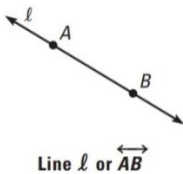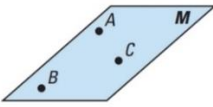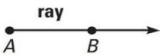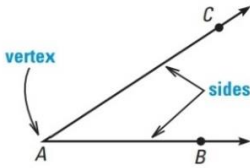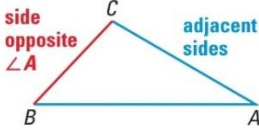

(Image from: Dillinger, B. (2011). *Chapter 1- Foundation of Geometry.* CK-12 Foundation Inc.)

KNOT

Let's refresh our memories on the geometry symbols you have encountered and summarize it in the table below.

Basic Geometric Terms	
Definition	Example
Point- an exact location in space. A point has no dimension.	A • (read as "point A")
Line- a collection of points along a straight path that extends endlessly in both directions.	 Line ℓ or $\overleftrightarrow{AB}$
Plane- a flat surface that extends endlessly in all directions.	 Plane M or plane ABC
Line Segment- a part of a line having two endpoints.	 $\overline{AB}$ (read as "line segment AB") The length of $\overline{AB}$ is denoted AB
Ray- a part of a line having only one endpoint.	 $\overrightarrow{AB}$ (read "ray AB") The endpoint is always the first letter.

Angle- composed of two rays having a common endpoint. This shared endpoint is called the **vertex** of the angle.	 ∠*BAC* (read as "angle *BAC*") The vertex is always the middle letter. ∠*BAC* can be written as ∠*CAB* or ∠*A*.
Triangle- a figure formed by three segments joining three noncollinear points	 Δ*ABC* (read as "Triangle *ABC*") Δ*ABC* can be written as Δ*ACB*, Δ*BAC*, Δ*BCA* Δ*CBA*, or Δ*CAB*

KEY TERMS

Below are the geometric terms discussed in lesson 1.1.1. Match the terms in column A to their description in column B.

COLUMN A	**COLUMN B**
_____1. Angle Addition Postulate	A. An angle that is greater than 90°
_____2. Collinear	B. The *m* in *m*∠*A*
_____3. Equilateral	C. The measure of any angle can be found by adding the measures of the smaller angles that are in it.
_____4. Isosceles	D. The common endpoint of the two rays that form an angle
_____5. Line	E. Three points lie on the same line
_____6. Measure	F. Intersection of two planes
_____7. Obtuse	G. An exact location in space
_____8. Point	H. A closed figure with 3 sides
_____9. Triangle	I. Triangle whose three angles have equal measures
_____10. Vertex	J. Triangle whose two sides are congruent

References:

Albarico, J.M. (2013). THINK Framework. Based on Science LINKS by E.G. Ramos and N. Apolinario. Quezon City: Rex Bookstore Inc.

Larson, R. Bowell, L. & Stiff, L. (2004). *Geometry.* McDougal Littell, a division of Houghton Mifflin Company.

Dillinger, B. (2011). *Chapter 1- Foundation of Geometry.* CK-12 Foundation Inc.

Halden. (2014, October 20). *Why do chairs sometimes wobble?* Retrieved from https://www.slideserve.com/halden/why-do-chairs-sometimes-wobble

Roberts, D. *Undefined terms.* Retrieved from https://mathbitsnotebook.com/Geometry/Basicterms/BTundefined.html

Roberts, D. *Basic Geometric Symbols and Labeling.* Retrieved from https://mathbitsnotebook.com/Geometry/Basicterms/BTnotation2.html

Prepared by: Arvin C. Fajardo
Position: Special Science Teacher (SST) III
Campus: PSHS – CLC

Reviewed by: Virginia A. Barlas
Position: Special Science Teacher (SST) IV
Campus: PSHS - WVC

Answer Key

Navigate:

A. **ALWAYS, SOMETIMES,** or **NEVER TRUE.**
1. NEVER TRUE
3. NEVER TRUE
5. ALWAYS TRUE
7. SOMETIMES TRUE

9. SOMETIMES TRUE
11. SOMETIMES TRUE
13. NEVER TRUE
15. ALWAYS TRUE

B. Line m, $\overleftrightarrow{WX}$ or $\overleftrightarrow{XW}$, $\overleftrightarrow{WY}$ or $\overleftrightarrow{YW}$, $\overleftrightarrow{XY}$ or $\overleftrightarrow{YX}$

C. Answers

1. Points *D, E,* and *F* are considered to be collinear since they lie on the same line.

3. Answers may vary. As an example, points *H, E,* and *G* do not lie on the same line.

D. Answers
1. The planes intersect in a line.
3. No.

E. Answers
1. $m\angle BFD = 70°$
3. $m\angle AFB = 40°$
5. $m\angle AFD = 110°$

F. Answers
1. 22
3. 24

G. Answers
1. Acute Isosceles Triangle
3. Obtuse Scalene Triangle

H. Not correct. The proper way to write it is $\angle ABC \cong \angle DBC$.

I. Not correct. Even though the angles have a common vertex and side, but they have interior points in common.

Answer key (Knot):
1. C.
3. I
5. F
7. A
9. H