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DepED
DEPARTMENT OF EDUCATION

Mathematics Activity Sheet Quarter 3 – MELC 4

Deriving Relationships of Geometric Figures Using Measurements and by Inductive Reasoning; Supplementary Angles, Complementary Angles, Congruent Angles, Vertical Angles, Adjacent Angles, Linear Pairs, Parallel and Perpendicular Lines

REGION VI – WESTERN VISAYAS

Mathematics 7
Learning Activity Sheet Quarter 3 – MELC 4: Deriving Relationships of Geometric Figures Using Measurements and by Inductive Reasoning; Supplementary Angles, Complementary Angles, Congruent Angles, Vertical Angles, Adjacent Angles, Linear Pairs, Parallel and Perpendicular Lines
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Development Team of Math Activity Sheet

Writer: Regine M. Debo

Illustrators:
Editors: Susan B. Pastera
Layout Artist: Mara Jamaica B. Floreno

Division of Cadiz City Management Team:
Ma. Lorlinie M. Ortillo
May P. Pascual
Susan B. Pastera
Rona F. de la Torre

Regional Management Team
Ramir B. Uytico
Pedro T. Escobarte, Jr.
Elena P. Gonzaga
Donald T. Genine
Aden A. Mosquera

Introductory Message

Welcome to Mathematics for Grade 7!

The **Learning Activity Sheet** is a product of the collaborative efforts of the Schools Division of Cadiz City and DepEd Regional Office VI - Western Visayas through the Curriculum and Learning Management Division (CLMD). This is developed to guide the learning facilitators (teachers, parents and responsible adults) in helping the learners meet the standards set by the K to 12 Basic Education Curriculum.

The **Learning Activity Sheet** is self-directed instructional materials aimed to guide the learners in accomplishing activities at their own pace and time using the contextualized resources in the community. This will also assist the learners in acquiring the lifelong learning skills, knowledge and attitudes for productivity and employment.

For learning facilitator:

The **Mathematics Activity Sheet** will help you facilitate the teaching-learning activities specified in each Most Essential Learning Competency (MELC) with minimal or no face-to-face encounter between you and learner. This will be made available to the learners with the references/links to ease the independent learning.

For the learner:

The **Mathematics Activity Sheet** is developed to help you continue learning even if you are not in school. This learning material provides you with meaningful and engaging activities for independent learning. Being an active learner, carefully read and understand the instructions then perform the activities and answer the assessments. This will be returned to your facilitator on the agreed schedule.

Learning Activity Sheets (LAS) 4a

Name of Learner: _____
Grade and Section: _____ Date: _____

MATHEMATICS 7 ACTIVITY SHEET

Deriving Relationships of Geometric Figures Using Measurements and by Inductive Reasoning; Supplementary Angles, Complementary Angles, Congruent Angles, Vertical Angles, Adjacent Angles, and Linear Pairs

I. Learning Competency with Code

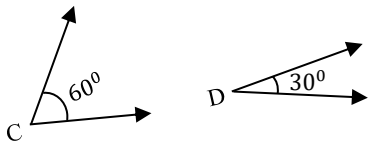
Derives relationships of geometric figures using measurements and by inductive reasoning; supplementary angles, complementary angles, congruent angles, vertical angles, adjacent angles, linear pairs, perpendicular lines, and parallel lines **(M7GE-IIIb-1)**

II. Background Information for Learners

There are pairs of angles mentioned in the earlier discussion.

This learning activity sheet will deal with angles that come in pairs.

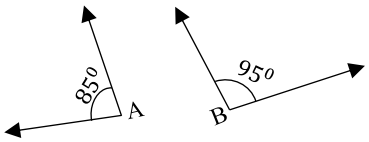
If the sum of the two angles is equal to $\mathbf{90^0}$, the angles are called ***complementary angles***. Thus, ***two angles*** whose sum is $\mathbf{90^0}$ are ***complementary***.



$m\angle C = 60^0$
$m\angle D = 30^0$
$60^0 + 30^0 = 90^0$
$Thus, \angle C \text{ and } \angle D \text{ are complementary.}$

If the ***sum*** of the two angles is equal to $\mathbf{180^0}$, the angles called ***supplementary angles***. Thus, **two angles** whose sum is $\mathbf{180^0}$ are ***supplementary***.

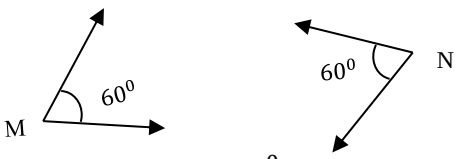
Example:



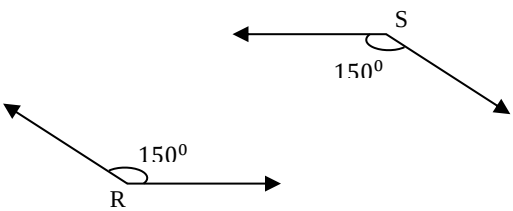
$m\angle A = 85^0$
$m\angle B = 95^0$
$85^0 + 95^0 = 180^0$
$Thus, \angle A \text{ and } \angle B \text{ are supplementary.}$

Congruent angles are two or more angles that are identical to one another. The type of angle does not matter as long as the measure of one angle is the same as the measure of the other angle, then they are congruent angles. **Congruent** in geometry means that one figure is identical to another in shape and size.

Examples:



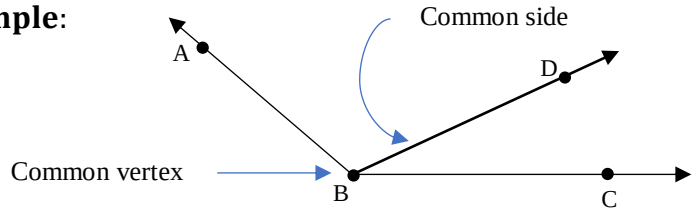
$m\angle M = 60^0$
$\mathrm{m}\angle N = 60^0$
Thus, $\angle M$ and $\angle N$ are congruent angles.



$m\angle R = 150^0$
$m\angle S = 150^0$
Thus, $\angle R$ and $\angle S$ are congruent angles.

Any two angles that share a **common ray or side**, a **common vertex** and whose interiors **do not overlap** are called ***adjacent angles***.

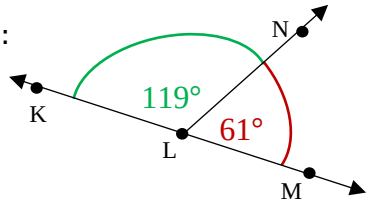
Example:



$\angle ABD$ and $\angle CBD$ have a common side $\overline{BD}$ and a common vertex $which\ is\ point\ B$, and their interiors do not overlap, hence they are adjacent angles.

If a ray is drawn from a point on a line to any direction not coinciding the line, two angles are formed. The ***sum*** of these angles is equal to $\mathbf{180^0}$. The two angles form a ***linear pair***. They are both adjacent and supplementary.

Example:

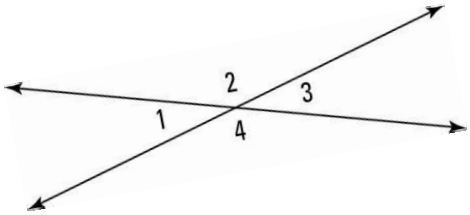


$m\angle KLN = 119°$
$m\angle MLN = 61°$
$119° + 61° = 180°$

- ∠KLN and $\angle MLN$ have a common side $\overline{LN}$ and are supplementary, thus they are a linear pair.

When two lines intersect, four angles are formed. ***Vertical angles*** are angles opposite each other and are always congruent. Any two intersecting lines form two pairs of vertical angles.

Example:



∠1 is opposite ∠3 so they are vertical angles, the same with ∠2 and ∠4.

III. Accompanying DepEd Textbook and Educational Sites

Mathematics Learner's Material pages 203-204
https://tutors.com
https://www.cuemath.com

IV. Activity Proper

Week 4: Day 1

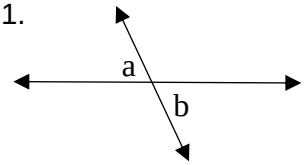
1. Directions / Instructions

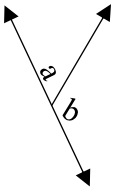
For further information about this lesson, please refer to Mathematics Learner's Material pages 200-201, https://tutors.com and https://www.cuemath.com

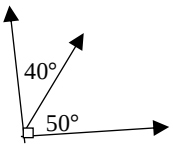
2. Exercises / Activities

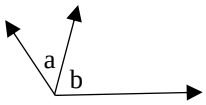
Exercise 1

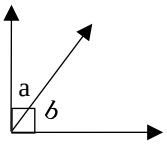
Direction: Name the relationships of the geometric figures below: complementary, supplementary, vertical, adjacent or linear pair.

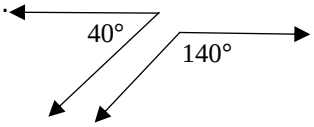
1. 

2. 

3. 

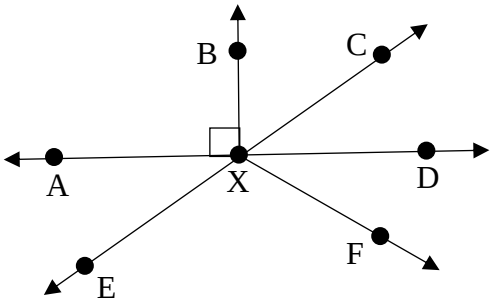
4. 

5. 

6. 

Exercise 2

Based on the figure below, name the other whose relationship is described.

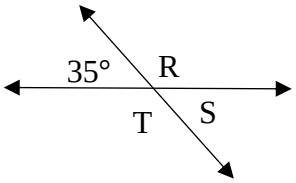


Lines AD and EC intersect at X

1. $\angle AXE$ and _____ are vertical angles.
2. _____ and $\angle DXF$ are supplementary angles.
3. $\angle DXC$ and _____ are adjacent and complementary angles.
4. _____and $\angle BXD$ are adjacent and congruent angles.

For numbers 5-7, refer to the figure at the right.

5. m$\angle R$ = _____
6. m$\angle S$ = _____
7. m$\angle T$ = _____



3. Guide Questions

Answer the following questions:

a. How did you find the activity?
b. What are the relationships of angles?
c. What are the conditions for angles to be a linear pair?
d. How do you differentiate complementary from supplementary angles?
e. How do you identify the relationship of angles?

V. Reflection

1. Name an object that represents each angle relationship: complementary, supplementary, congruent, adjacent and vertical angles.

_____
_____
_____
_____
_____
_____

VI. Answer Key

Exercise 1:

1. Vertical angles
2. Linear pair, supplementary
3. Complementary, Adjacent
4. Adjacent angles
5. Complementary, Adjacent
6. Supplementary angles

Exercise 2:

1. ∠CXD
2. ∠AXF
3. ∠CXB
4. ∠AXB
5. 145°
6. 35°
7. 145°

Learning Activity Sheets (LAS) 4b

Name of Learner: _____
Grade and Section: _____ Date: _____

MATHEMATICS 7 ACTIVITY SHEET
Deriving Relationships of Geometric Figures Using Measurements and by Inductive Reasoning; Supplementary Angles, Complementary Angles, Congruent Angles, Vertical Angles, Adjacent Angles, and Linear Pairs

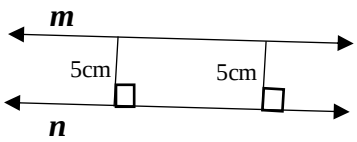
I. Learning Competency with Code

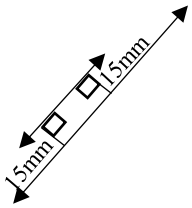
Derives relationships of geometric figures using measurements and by inductive reasoning; supplementary angles, complementary angles, congruent angles, vertical angles, adjacent angles, linear pairs, perpendicular lines, and parallel lines **(M7GE-IIIb-1)**

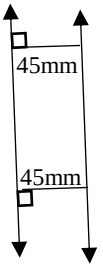
II. Background Information for Learners

In geometry, parallel lines can be defined as two lines on the same plane that have equal distance from each other and never meet. Parallel lines are represented by two bars ‖.

Examples of Parallel lines

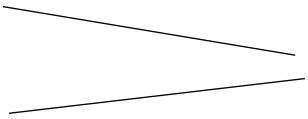


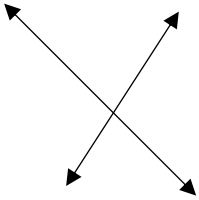


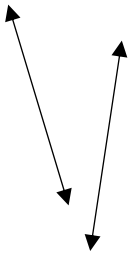


At the right angles, the distance between two lines are the same, thus the lines are parallel.

Examples of Non-Parallel lines

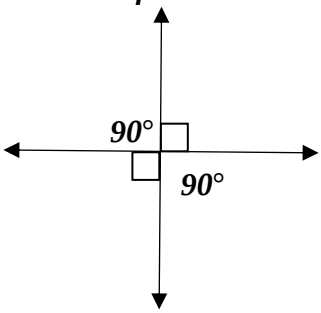


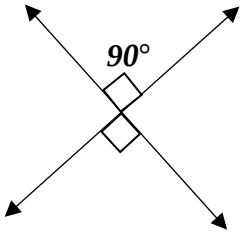


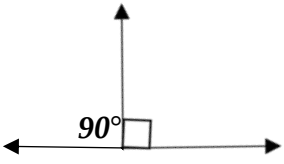


In geometry, perpendicular lines are defined as two lines that meet or intersect each other and form right angles (90°). The symbol for perpendicular lines is " ⊥ " . When two perpendicular lines meet, they form four right angles.

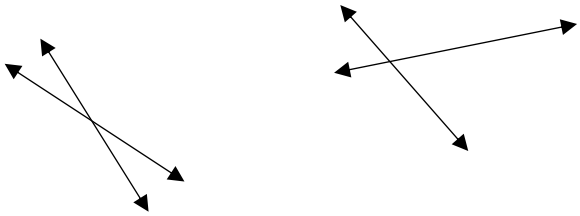
Examples of Perpendicular lines:







Examples of Non-Perpendicular lines:



III. Accompanying DepEd Textbook and Educational Sites

Mathematics Learner's Material pages 200-201
https://www.splashlearn.com/mathvocabulary/geometry/perpendicular
https://www.mathsisfun.com/definitions/perpendicular-lines.html

IV. Activity Proper

Week 4: Day 2

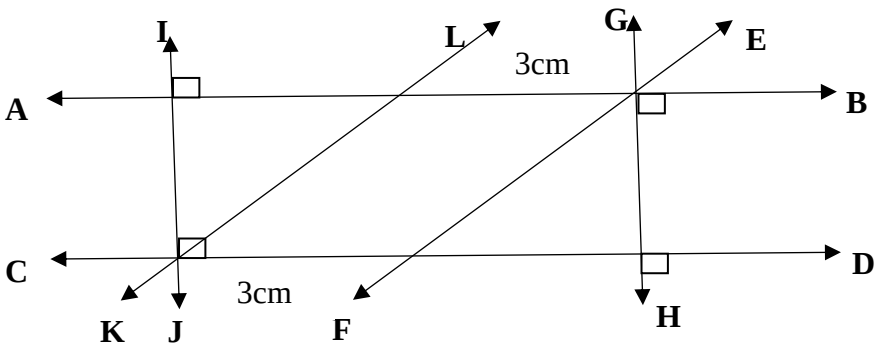
1. Directions / Instructions

For further information about this lesson, please refer to Mathematics Learner's Material pages 200-201, https://www.splashlearn.com/mathvocabulary/geometry/perpendicular and https://www.mathsisfun.com/definitions/perpendicular-lines.html

2. Exercises / Activities

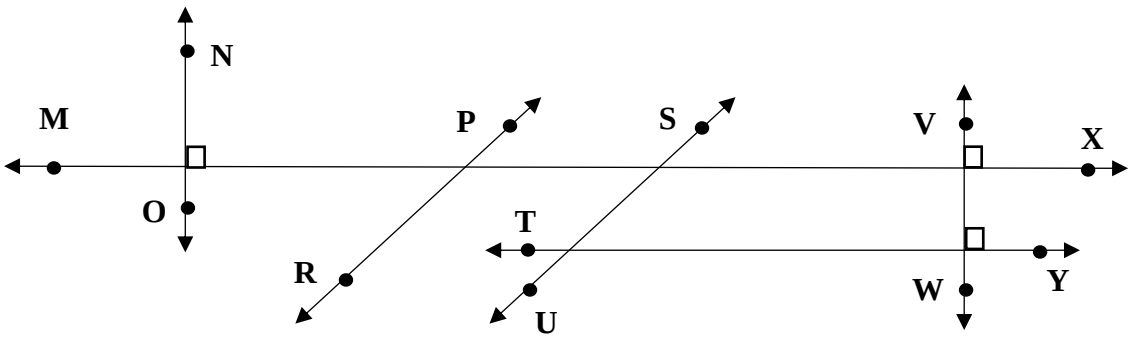
Exercise 1

Direction. Tell whether the given pair of lines are parallel or perpendicular.



1. $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ are _____ lines.
2. $\overleftrightarrow{GH}$ and $\overleftrightarrow{AB}$ are _____ lines.
3. $\overleftrightarrow{KL}$ and $\overleftrightarrow{FE}$ are _____ lines.
4. $\overleftrightarrow{AB}$ and $\overleftrightarrow{IJ}$ are _____ lines

Exercise 2.
Direction: Answer the following using the illustration below. Write your answer on the space provided.



1. Which line is perpendicular to $\overleftrightarrow{NO}$? _____
2. Which line is perpendicular to $\overleftrightarrow{TY}$? _____
3. Name the lines that are parallel to $\overleftrightarrow{VW}$. _____
4. **TRUE or FALSE.** $\overleftrightarrow{MX}$ is perpendicular to $\overleftrightarrow{US}$. _____

3. Guide Questions

Answer the following questions:
a. How did you find the activity?
b. How do you differentiate parallel from perpendicular lines?
c. If you are to extend the lines of a parallel figure, will the lines meet eventually?

V. Reflection

Answer the following questions:
1. Name 3 objects that represent parallel lines.
2. Name 3 objects that represent perpendicular lines.
3. Did you find this lesson useful? Cite examples.

_____
_____
_____
_____
_____

VI. Answer Key

Exercise 1:
1. parallel
2. perpendicular
3. parallel
4. perpendicular

Exercise 2:
1. $\overleftrightarrow{MX}$
2. $\overleftrightarrow{VW}$
3. $\overleftrightarrow{TY}, \overleftrightarrow{MX}$
4. FALSE