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Mathematics

Quarter 4 - Week 3-Module 3
Illustrates Angles of Elevation and Angles of Depression

AIRs - LM

Mathematics 9
Quarter 4 Week 3- Module 3: Illustrates Angles of Elevation and Angles of Depression
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Angles of Elevation and Angles of Depression

In this lesson, you are going to illustrate angles of elevation and angles of depression.

Suppose you are on top of a mountain looking down at a particular village, how will you directly measure the mountain's height? An airplane is flying to a certain altitude above the ground. Is it possible to instantly find the distance from the airplane to an airport using a ruler? As you have learned in the previous lesson, the trigonometric ratios will help you answer these questions. Perform the succeeding activities to apply these concepts in solving real-life problems.

Jumpstart

What are some of the important terms in this lesson? Let's find out by doing this activity.

ACTIVITY 1: HUNTING TIME!

Directions:

Study the Word Grid below. Find all the terms related to angles of elevation and angles of depression that are hidden in the grid. The words may be hidden in any direction. Write your answers below.

A	V	O	N	E	B	R	S	G	H	K	L	T	O	E
L	O	S	A	D	E	P	R	E	S	S	I	O	N	Y
T	E	E	A	R	L	G	X	Z	B	N	D	M	J	E
E	L	I	N	E	O	F	S	I	G	H	T	P	E	L
R	E	W	G	E	W	R	T	M	Y	U	I	O	V	E
N	V	S	L	D	F	G	H	A	J	K	L	M	O	V
A	A	X	E	C	V	B	N	G	M	Q	W	E	B	E
T	T	Y	U	I	H	O	R	I	Z	O	N	T	A	L
E	I	P	A	S	D	F	G	N	H	J	K	L	Z	X
C	O	V	B	N	M	K	J	A	G	F	D	S	A	W
D	N	V	B	G	R	E	V	R	E	S	B	O	G	H
I	N	T	E	R	I	O	R	Y	O	P	A	S	D	F

Answers:

_____ _____

_____ _____

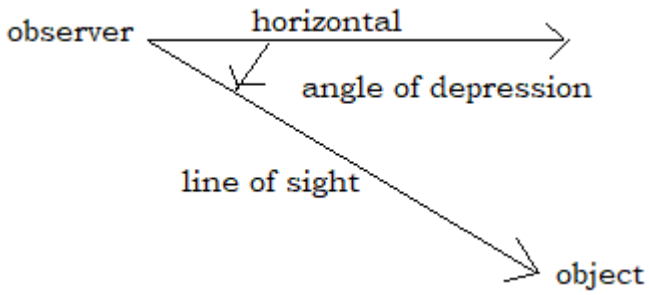
_____ _____

_____ _____

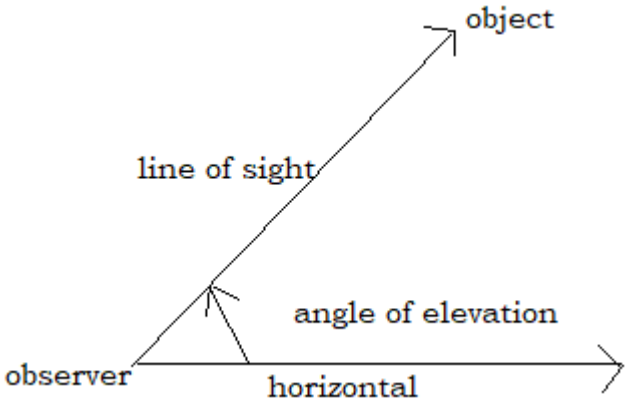
_____ _____

Discover

Line of sight is an imaginary line that connects the eye of an observer to the object being observed. If the observer is in the higher elevation than the object of observation, the acute angle measured from the eye level of the observer to his line of sight is called ***angle of depression.***

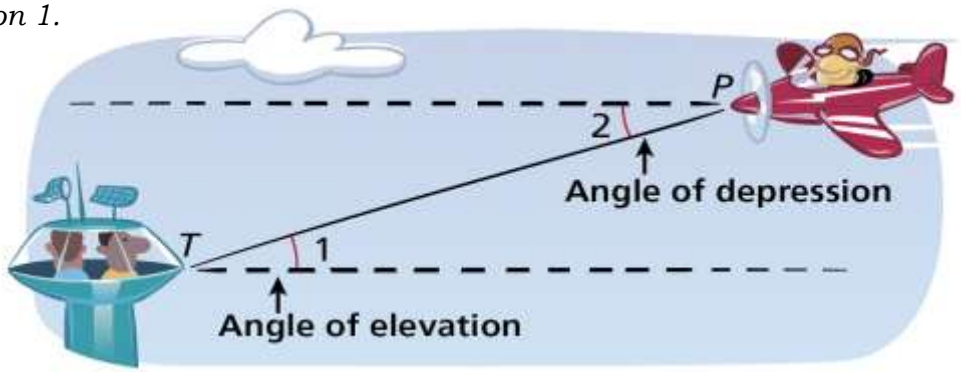


On the other hand, if the situation is reversed, that is, the observer is at the lower elevation than the object being observed, the acute angle made by the line of sight and the eye level of the observer is called ***angle of elevation.***



Since horizontal lines are parallel, ∠1 ≅ ∠2 by the Alternate Interior Angles Theorem (The **Alternate Interior Angles Theorem** states that, when two parallel lines are cut by a transversal, the resulting alternate interior angles are congruent). Therefore, the angle of elevation from one point is congruent to the angle of depression from the other point.

Illustration 1.



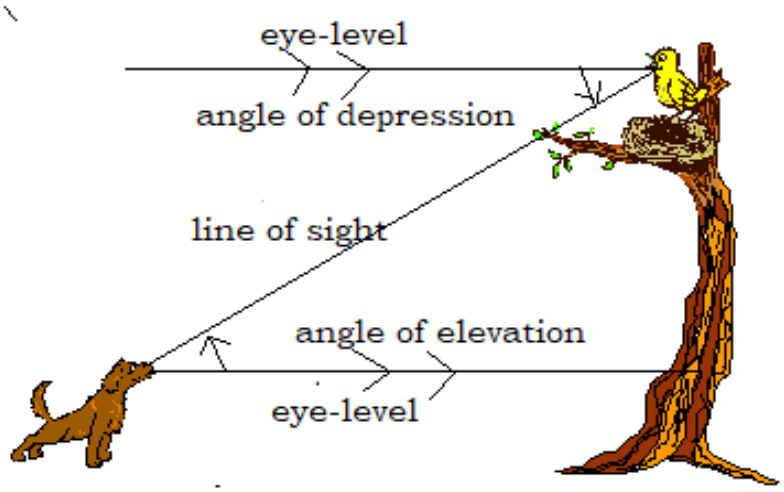


Illustration 2.

Illustrative Examples:

Classify each angle as an angle of elevation or an angle of depression.

1. ∠1

∠1 is formed by a horizontal line and a line of sight to a point below the line. It is an angle of depression.

2. ∠4

∠4 is formed by a horizontal line and a line of sight to a point above the line. It is an angle of elevation.

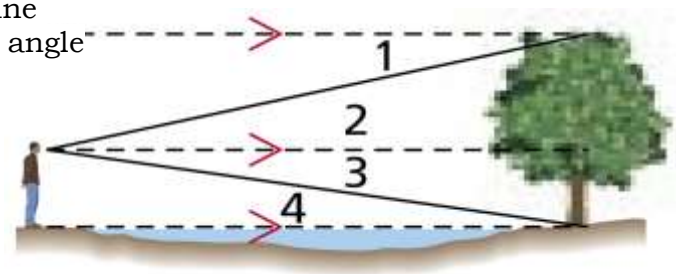


Figure 1

3. ∠1

∠1 is formed by a horizontal line and a line of sight to a point above the line. It is an angle of elevation.

4. ∠2

∠2 is formed by a horizontal line and a line of sight to a point below the line. It is an angle of depression.

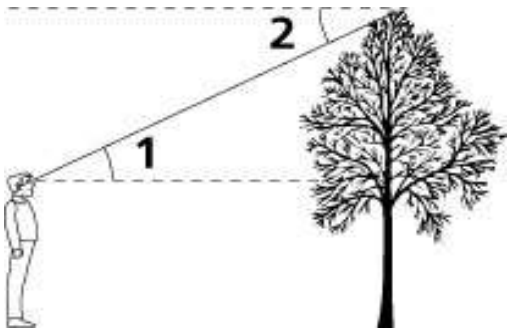


Figure 2.

Explore

Activity 2: Identify Me!

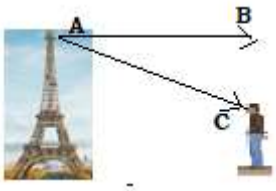
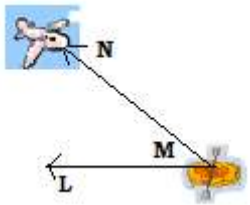
Directions:
Identify the situation if it illustrates a real scenario of angle of elevation or angle of depression.

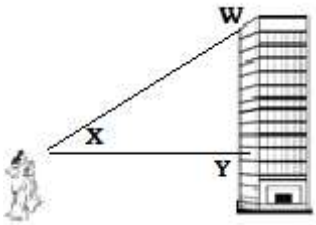
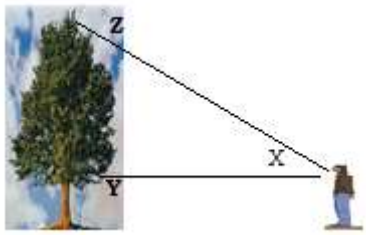
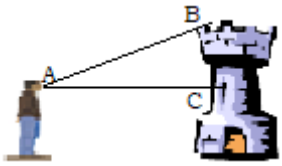
1. Jed is proposing a marriage to Chezka.
2. Angela look to Mia's eye who is smaller than her.
3. At 9:00 in the evening, Kristine went to the rooftop of their house to watch a meteor shower.
4. tying a shoe lace
5. removing of cob waves in the ceiling.

Now that you know the important ideas about the topic, let's go deeper by moving on to the next section.

Deepen

Activity 3: Where Do I Belong?
In the following figures, identify the segments that represents the line of sight, and identify the angles (if any) that represent the angle of elevation or angle of depression.

Figure	Angle of Elevation	Angle of Depression	Line of Sight
1. 			
2. 			

3.  			
4.  			
 5.			

Questions:

1. How did you identify the line of sight, angle of elevation, and angle of depression?
2. What ideas have you learned from this activity?
3. Do you think you can use these ideas in your daily life?