

Lesson Plan

Header

Name:

Unit Title: Right Triangle Trig without the Unit Circle (Unit in 0078608627)

Lesson title: Angle of Inclination and Depression

Date:

Duration of Lesson: 90 min.

Day Number:

Grade Level: 11th/12th

State Standards Addressed:

South Carolina Standard	Objectives/ Learning Goals
I.A.4 Evaluate all six trigonometric functions using the right triangle and wrapping function definitions.	Students will be able to use angle of elevation and angle of depression to model applied problems. Students will be able to solve applied problems using right triangle trigonometry.

Rationale/Goals of the Lesson

The purpose of this lesson is to enable students to model and solve applied problems using right triangle trigonometry .

Materials Needed for the Lesson

Overhead and transparencies OR Promethean board, graphing calculators, handouts for each student, pencils, paper

How will problem solving be incorporated into the lesson?

Students will be using a limited amount of given information to solve applied problems.

How will the material in this lesson be connected to previously learned material and how does this lesson pave the way for future lessons?

Students have been learning about right triangle trigonometry. Today they will use what they have been learning in order to model and solve applied problems. This will prepare students to gather real life data and find measures of objects using right triangle trigonometry tomorrow.

How will appropriate technology be incorporated into your instruction?

Throughout the lesson and homework time, the students will be allowed to use their calculators to check their algebraic calculations. The overhead projector/Promethean board will be used so all students can easily see the notes/examples.

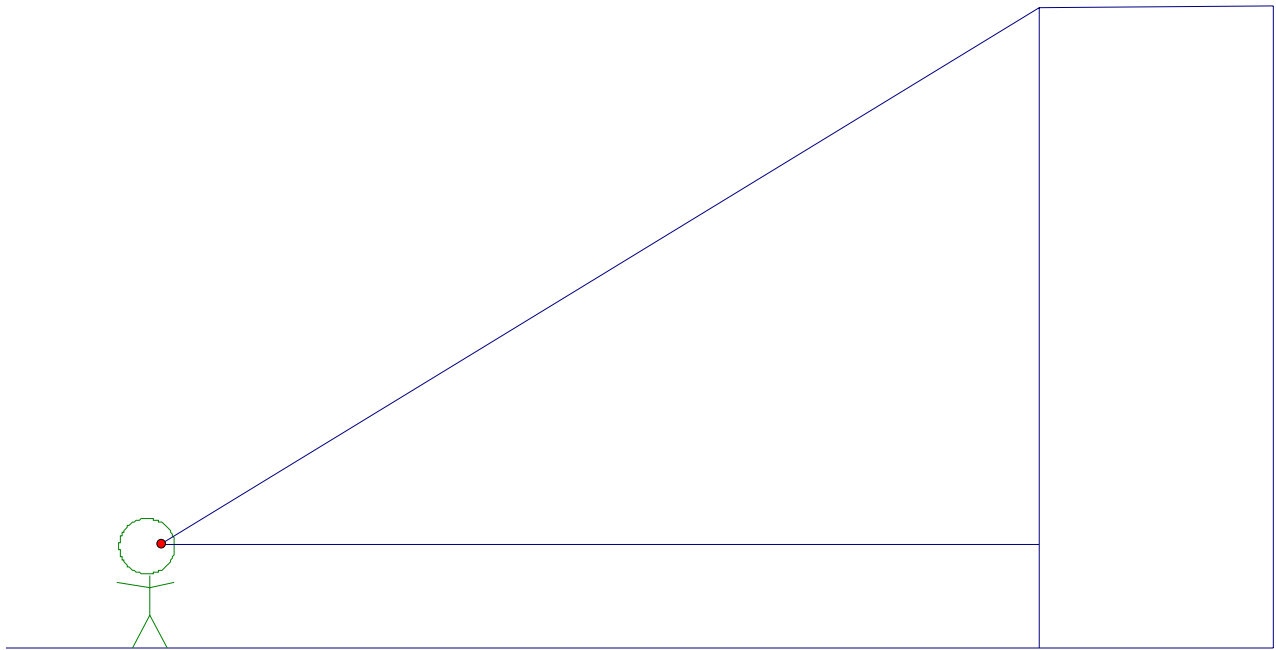
Accommodations

Depending on the disability, the student will be accommodated accordingly. Each point of instruction will be given both verbally and in writing. All students will have the opportunity to practice examples while the guidance of myself and my mentor teacher is available.

Instructional Procedure:

- Anticipatory Set/Set Induction:
 - Homework Review (10-15 min)
 - Quick warm-up (10-15 min including going over problems)

Warm-Up



- 1) Bob is traveling to the castle. Using the given information, find how far Bob is horizontally from the castle.
- 2) Find the measure of angle A .
- 3) Find the distance between Bob's eyes and the top of the castle.

Instructional Outline: (40 min)

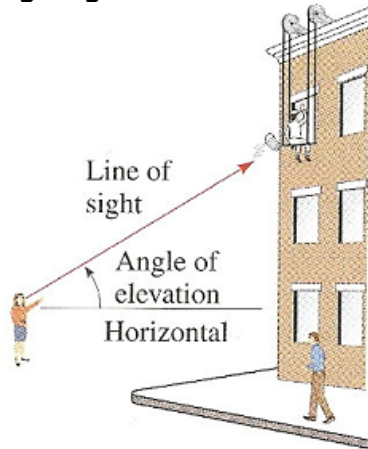
Angle of Elevation and Angle of Depression

I. Applications of Right Triangle Trigonometry

- a) A person's line of sight is the line from the observer's eye to the object.
- b) The angle of elevation is the angle between the line of sight and the horizontal if the object being observed is above the horizontal
- c) The angle of depression is the angle between the line of sight and the horizontal if the object being observed is below the horizontal

Example 1) Finding Angle of Elevation

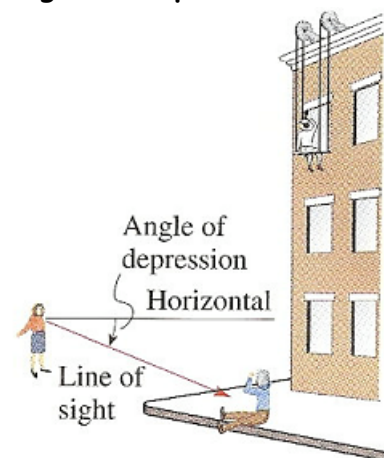
- a) Find the angle of elevation



- b) Find the distance from the woman to the paint can.

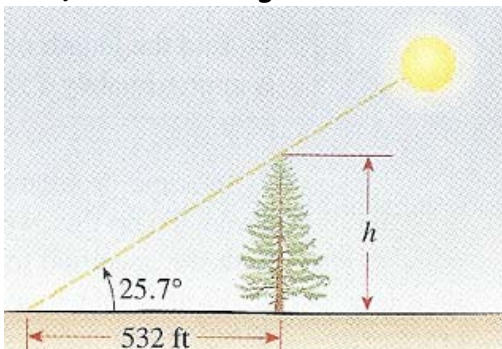
Example 2) Finding Angle of Depression

- a) Find the angle of depression



- b) Find the distance from the woman to the injured man.

Example 3) Find the height of the tree.



- Example 4) Joanna knows that when she stands 134 ft from the base of a flagpole, the angle of elevation to the top of the flagpole is 27° . If her eyes are 5.4 ft from the ground, draw a picture to model her situation and find the height of the flagpole.

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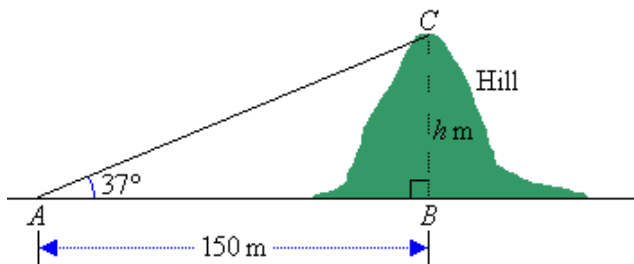
Date: _____

Class Work: Angle of Elevation and Depression

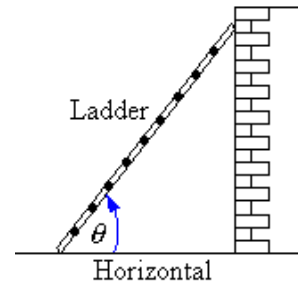
Homework: Finish today's class work for a grade and do pages 490-491, numbers 35, 39, 41, 43, 51. Round decimal answers to the nearest hundredth.

I. Find the missing length:

1) A surveyor measures the angle to the peak of a hill from point A, as shown in the diagram. Calculate the height of the hill.



2) A 20 ft ladder forms an angle θ of 40° with the ground when placed against a brick wall. How far is the base of the ladder from the wall?



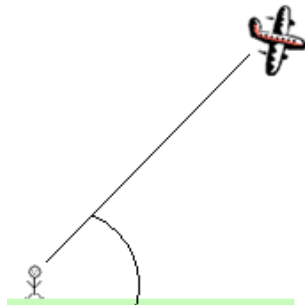
3) A bird on top of a 200 ft bridge tower sees a man standing on the lower part of the bridge (which is 50 ft above the ground). The angle of depression from the bird is 26° . How far is the man from the base of the bridge tower?



4) In the figure from problem 3, if angle of elevation from the man to the bird was 48° , what would be the distance between the bird and the man?

II. Find the angle of elevation:

5)

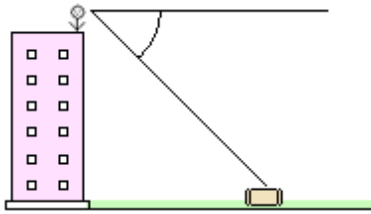


6)

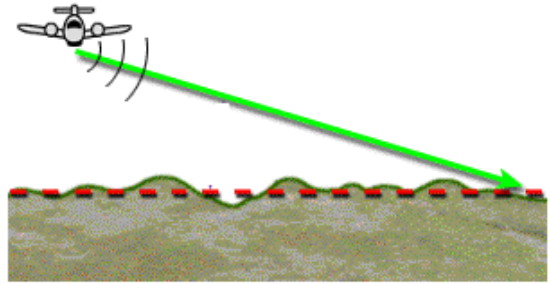


III. Find the angle of depression:

7)



8)



IV. Word Problems

9) From the top of a 200-ft lighthouse, the angle of depression to a ship in the ocean is 23° . How far is the ship from the base of the lighthouse?

10) A 20-ft ladder is leaning against a building. If the base of the ladder is 6 ft from the base of the building, what is the angle of elevation of the ladder? How high does the ladder reach on the building?

11) A 600-ft guy wire is attached to the top of a communication tower. If the wire makes an angle of 65° with the ground, how tall is the communication tower?

12) An airplane is flying at an elevation of 5150 ft, directly above a straight highway. Two motorists are driving cars on the highway on opposite sides of the plane, and the angle of depression to one car is 35° and to the other is 52° . How far apart are the cars?

Examples and Non-Examples:

- See Class Work: Angle of Elevation and Depression

Review/Closure (20 min)

- Review important points in the lesson/Answer any questions that remain.
- Have each group put the answer to one of the class work exercises on the Promethean Board. Students will take the notes and class work home to help with homework and will turn the class work assignment in tomorrow.
- Assign homework.

Homework: Finish today's class work and do pages 490-491, numbers 35, 39, 41, 43, 51

Procedural and Higher Order Questions:

1. How do you tell whether an angle is an angle of depression or an angle of elevation? - Use the observer's horizontal line of sight. If the angle is above the horizontal line of sight, it is an angle of elevation. If the angle is below the horizontal line of sight, it is an angle of depression.
2. When would I use the term "angle of inclination"? If the line of sight follows a physical object, such as an inclined plane or a hillside, we use the term angle of inclination. In this case, the line of sight is not horizontal, but is parallel to the inclined plane or hillside.

Evaluation/Assessment of Student Learning

Throughout the lesson, I will be asking the students questions and listening to their feedback. If I see very puzzled looks when I explain a concept, I will try to explain it in a different way that may make more sense. While students are working on the assignment, I will move around the room watching them work and answering questions. Students will turn in the Angle of Elevation and Angle of Depression worksheet tomorrow for a classwork grade and each group will be responsible today for putting one of the answers up on the Promethean Board. I can use this information as a formative assessment. This section will also be on the next quiz and on the unit test.

Self Assessment and Revision:

During the course of the lesson, I will need to pay attention to the clock and to my students to see if I am giving them too much information at once. I will also take notes on the lesson after I give it and answer the following questions:

What went well and why?

What didn't go so well and why?

If I were to re-teach this lesson, this is how I would change it.