

TRIGONOMETRY

Gallery Walk

World Engineering Corp. sent your engineering group to the Tidal Basin in Washington, DC. You are to inspect the 30-foot-tall statue of Dr. Martin Luther King, Jr. for any damage or mold growth. If your photographer was standing 40 feet from the base of the statue, what angle of elevation are they sighting the top of the statue?



The table below shows the average high temperatures per month for Tampa, Florida. Information was found at the World Climate website (www.worldclimate.com)

An equation that models Tampa using a sine function in the form of $y = A \sin(Bx - C) + D$.

Month	"F
Jan.	70
Feb.	73
Mar.	76
April	81
May	87
June	90
July	90
Aug.	90
Sept.	89
Oct.	84
Nov.	78
Dec.	72



Photo Courtesy: Jean Adams

The St. Augustine Lighthouse operates on a 4th Order Fresnel Lens that has a range of 15 nautical miles. Your team of engineers observe two large vessels offshore, from the 164-foot-tall lighthouse. The angles of depression to the boats are 6.5° and 10° , respectively. How far apart are the two vessels in nautical miles?

Note: 1 nautical mile = 6076.12 feet.



Photo Courtesy: Jean Adams

2.





Trigonometry Gallery Walk

PreCalculus students will walk through a variety of real-world Applications of Right Triangle Trigonometry prompts.

This activity is designed to challenge your **PreCalculus** students by engaging them in conversations related to right triangle trigonometry and sinusoidal curve fitting questions.

Applications of Trigonometry Gallery Walk

The **Trigonometry Gallery Walk** includes 8 task cards related to right triangle trigonometry, sinusoidal curve fitting, and problem-solving strategies. The activity works well as a review at the end of your Trigonometric Functions Unit. The odd-numbered cards require minimal knowledge and time to complete. They can be used as a group of exercises to balance each task equally among your students.

There is also a student recording sheet and answer key provided.

Students will practice the following skills:

- ☒ Right Triangle Trigonometry
- ☒ Fitting data to a sinusoidal curve.

Suggestions for using the activity:

- ☐ Students may work as a group to answer each prompt.
- ☐ Students may work as a group to find a solution; but have independent work.
- ☐ Students work each task on a large piece of butcher paper, rotating roles for each task.



Your team of engineers has been called to Pisa, Italy. Your task is to check on the stability of the Leaning Tower of Pisa. When the structure was stabilized between 1993 and 2001, the 5.5 degree lean was reduced to 3.97 degrees. You climb the tower and drop a weighted object to the ground that lands 12 feet 8 inches from the base. How tall is the tower?



Photo Courtesy: Jean Adams

1.

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Photo Courtesy: Jean Adams

2.

Note: 1 nautical mile = 6076.12 feet.

Your engineers from WEC stopped at the Washington Monument to inspect the newly repaired elevator system in this engineering marvel. The entire structure is held together by gravity and friction, no mortar was used between the bluestone gneiss stones. When looking through the observation windows at the top of the 555-foot-tall structure, you can see the Lincoln Memorial which is 0.7 mile away. At what angle of depression are you sighting the memorial?



Photo Courtesy: Jean Adams

The table below shows the average high temperatures per month for Tampa, Florida. Information was found at the World Climate website (www.worldclimate.com)

Write an equation that models the data using a sine function in the form of $y = A \sin(Bx - C) + D$.

Month	"F"
Jan.	70
Feb.	73
Mar.	76
April	81
May	87



4.

Engineering Corp. set up to the top of the 30-foot King, Jr. fountain. If you stand 4 feet from the base, what is the angle of elevation to the statue?



Photo Courtesy: Jean Adams

5.

Machu Picchu is a better safety needs. The World Engineering Corp. solve their problem. Assuming the radius of the Earth is 3960 miles. The total distance, the satellite signal needs to reach a distance of 4000 miles. Find the height the satellite needs to provide the signal historic site.



Photo Courtesy: Andy Perez

6.

Your team has been management team at Commerce Center in Hong Kong to help them celebrate the anniversary of the building.

From a park area located from the building, your client launch a series of fireworks. height of the building, by at feet. If the building is 1588 feet height, find the angle of elevation that will keep the fireworks explosion at the minimum height above the building.

Photo Courtesy: Jean Adams

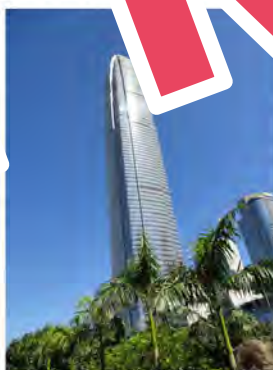


Photo Courtesy: Jean Adams

7.

NASA researchers reported that a team of astronauts sent to Mars found a Martian creature was responsible for disabling the InSight Mars lander, earlier this year. Upon capturing the being, doctors realize the creature's body temperature is varying sinusoidally with time. They perform diagnostic tests to determine how to stabilize the alien.

At 20 minutes after they begin timing, the temperature reaches a high of 112°F. 30 minutes after that, it reaches its low of 98°F.

- Write an equation expressing temperature in terms of minutes since they started timing.
- What was its temperature when they first started timing?
- Find the first three times after they started timing at which the temperature was 104°F.



8.

Applications of Trigonometry
Gallery Walk

Name _____

1.	2.
3.	4.
5.	6.
7.	8.

Gallery Walk

1. **Post questions** around the room. Give adequate space for student movement.
2. **Prepare students** with instructions for carrying out the technique and any evaluation expectations. Some students who prefer to work alone may be reluctant to participate. This can be avoided if students have a specific role for each round.
3. **Group Students and Assign Roles** in teams of 3 to 5, assign a task and method or rotating each round.
 - Leader – keep group on task, assure that all members understand key elements of prompt.
 - Recorder – writes group responses on poster paper or student recording sheet.
 - Reporter – present group thoughts on their prompt to class
 - Monitor – timekeeper and organizer for writing responses.
 - Emissary – is the go-between when group needs hint, tip, from teacher.
4. **Begin Activity** by directing groups to a starting prompt. Be sure to encourage student discussion and monitor that all group members are participating.
5. **Report Out** at the end of the activity, allow about 10 minutes for the group to collaborate. Then choose a “reporter” for each prompt to share the thoughts from their group. Be sure to reinforce concepts that are expressed accurately and help correct misconceptions and errors. What did they find difficult? What did they easily understand and comprehend?