

MTH140 – College Algebra and Trigonometry
Exercise

In the Louisiana bayou country, there are two towns (Swampville and Gatortowne) located on two different roads that intersect at an acute angle when traveling from Swampville to Gatortowne. The people living in this territory have a serious dilemma: Swampville has the best locally brewed beer in the entire state and Gatortowne has the best cheeseburgers possible (a real gourmet treat). This means that everyone is spending far too much money on gasoline for their large, four-wheel drive pickup trucks (complete with a full rack of long guns in the rear window of the cab) driving back and forth between the two towns.

To solve this problem, the people petition the state of Louisiana to build a road directly between the two towns to save on the driving distance. The state agrees that this is a serious problem and promptly sends a survey unit to the scene. Since there is a large alligator swamp lying between the two towns, the head surveyor parks his panel truck at the intersection of the two highways and sends flunkies running to the two towns carrying reflecting poles for the laser beam survey instrument. He then measures the distance from the intersection to Swampville to be 25 miles and the distance from the intersection to Gatortowne to be 40 miles. The angle shot from Swampville to Gatortowne measures 39.6 degrees.

The surveyor then drives back to his office, leaving the expendable flunkies, and calculates the direct distance from Gatortowne to Swampville and the angle at Gatortowne to Swampville measured from facing the intersection to facing Swampville. What is this distance and what is the angle?

Note: This assignment has a good potential to generate scorable artifacts because it follows the recommendations in the artifact guidelines and implicitly asks the student to demonstrate the capabilities in the Critical Thinking rubric.

The artifact is written on paper format and is approximately 1-2 pages of mathematical calculations, which follows the recommendations of the Artifact Guidelines.

The problem is identified for the student in text. It implicitly asks the student to present the problem numerically. (Capability #1 on the Critical Thinking rubric)

To solve the problem the student must be able to go through these steps (as presented by the instructor):

1. Read and interpret written situations
2. Deal with extraneous information (could help measure capability #2 on CT rubric)
3. Organize relevant information (Capability #3 on CT rubric)
4. Plan a strategy to solve the problem (Capability #4 on CT rubric)
5. Identify and define variables (in a labeled drawing)
6. Use formulas to create statements about the variables (Capability #3 on CT rubric)
7. Communicate steps and thought process in a way that are easily followed (Capability #4 on CT rubric)
8. Solve statements and use the results to answer the questions. (Capability #5 on CT rubric)
9. Communicate results
10. "Appreciate mathematics with joy and enthusiasm, which can be measured by the absence of tear stains."

CAVEAT: The assignment has not been altered from its original format. The comments were provided by the instructor and the Scholarship Action Group.