Pythagorean Theorem Life Application Webquest

Welcome to the Life Application webquest for the Pythagorean Theorem. Your mission has three phases:

- Phase 1: Consider a real-life scenario. Break down the problem by drawing a diagram to show known and unknown information and by researching possibilities to satisfy the criterion.
- Phase 2: Create a table to organize your information. Synthesize and evaluate all possible solutions against given criterion and propose a solution.
- Phase 3: Create your own problem that requires the Pythagorean Theorem. Include at least one criterion that requires gathering information to compare and contrast two or more options. Solve your problem.

Objectives

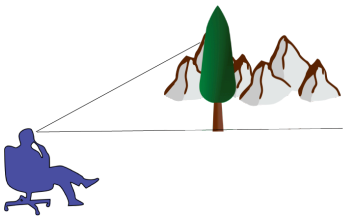
After completing the Life Application webquest, students will be able to...

- Correctly analyze a given problem listing known information and unknown information.
- Correctly gather information required to solve the problem given the Internet.
- Correctly identify what the problem is asking them to find.
- Correctly construct an expression using variables and numeric values to represent the value they need to find.
- Correctly calculate the value they need to find.
- Correctly organize their calculated and gathered information into a table.
- Adequately propose a solution to the problem given the information in their table.
- Adequately create, develop a plan for solving, and solve an original problem.

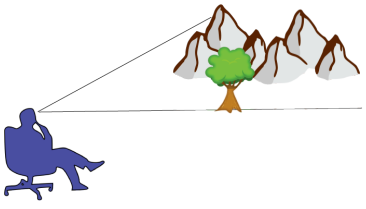
Life Application
Phase 1: The Problem

Your neighbor offers to pay you to complete a landscaping project for him. The money he offered will cover your final payment for your senior trip to Florida or the new gaming system you've been wanting. The project involves researching the sizes of trees that he likes and selecting and planting one that best meets his criterion.

The criterion is that the tree must not block his view of the mountains when it is full grown. The neighbor must be able to see over the top of the tree when he sits on his back patio. The distance from the ground to his eyes when he is seated is 4 feet. The distance from his patio to the end of his yard, where he wants to plant the tree, is 100 feet. The distance from his gaze, which is about 30 degrees above the horizontal, to the tops of the mountains is 115 feet.



The tree obstructs the man's view.



The man sees the mountains.

Print out the pythagorean-theorem-life-application (PDF) and answer the following questions under Phase 1.

1. Draw a diagram of the problem and label any known and unknown information.
2. Your neighbor has selected five possible trees. Browse the following websites and note the height range for each tree.
    - Red Dogwood
    - Bur Oak
    - Horsechestnut
    - Sweetbay Magnolia
    - Tuliptree (Yellow Poplar)

Note: Artwork design included individual illustrations from Open Clip Art and Public Domain Clip Art.

Life Application
Phase 2: The Analysis

Answer the following questions under Phase 2 of your worksheet.

1. Create a table of values to compare and contrast the different trees with respect to your neighbor's criterion.
    - Enter the name of each tree.
    - Enter the maximum height for each tree.
    - Create a formula for calculating the distance from the top of each tree to the top of the mountains relative to the man's gaze.*
    - Enter the distance from the top of each tree to the top of the mountains.
2. Select and recommend a tree for your neighbor. Which one did you choose and why?

*The distance from the top of a tree to the top of the mountains relative to the man's gaze will be the amount of mountains that the man is able to see above the tree if the tree grows to its maximum height. Don't forget to consider the 4 feet from the ground to the man's eyes when calculating this figure.

Life Application
Phase 3: Create Your Own Problem

In this final phase, you will create your own real-life problem that requires the Pythagorean Theorem to solve. Follow the instructions under Phase 3 of your worksheet.

1. Review the following websites for ideas but create an original problem scenario.
    - Application of the Pythagoras Theorem in Real Life Scenarios
    - Quandaries and Queries
2. Create an original problem scenario. Include at least one criterion that requires gathering information to compare and contrast two or more options.
3. Solve your problem by breaking it up into manageable chunks. Draw a diagram showing known and unknown information, create a table to organize your information, and use your table to analyze your information and find a solution. Defend your solution by showing all of your work. Attach any additional paper that you need to solve the problem.