## Redwood Trees

Redwoods have been known by the Europeans for a long time. The first record of Redwood trees is by a "Franciscan missionary, Fray Juan Crespi, diarist of the Portola expedition-the first European expedition by land up the California coast. ${ }^{\text {." }}$

There are many ways to find the height of trees such as the shadow method and the felling method or pencil method.(Note for the following projects I am going to refer to a pencil or stick as stick only)

The problem: I want to find the height of a tree in my yard. I only have the tree's shadow, my shadow, my height, measuring tape, ruler, and a pencil or stick.

Method 1: The Shadow Method (For the best results, do this method on a bright, sunny day)

1. Know your exact height in the shoes you will be wearing to perform this method.

2. Stand next to the tree or the object to be measured.

3. Measure the length of your shadow. (For best results, do this method on a bright, sunny day.) Use a tape measure or yardstick (meter ruler) to measure your shadow
 from your feet to the tip of your shadow.
4. Measure the length of the tree's shadow. Use your measuring tape to determine the length of the tree's shadow from the base of the tree to the tip of the shadow. (Works best if the
 ground all along the shadow is fairly level)

## 5. Calculate the tree's height by

 using the proportion of your shadow's length to your height. Since you know the length of the tree's shadow, and you also know that a certain height produces a certain shadow length; you can determine the tree's height with a little math I.e. using the ratio of length of shadowheight of tree=length of shadowheight of person . You are 5 feet tall, your shadow is 8 feet long, and the tree's shadow is 100 feet long. We have $100=85$. The height of the tree is $(100 \quad 5) 8=62.5$.

Method 2: Pencil Method: Requires an Assistant

## 1. Requires 2 or more people

2. Choose a stick that is exactly the same length as the distance from fingertips to eyes

until the tree height is the same as the stick

3. Turn the stick $90^{\circ}$ so that the stick is horizontal.
4. Measure the distance to the tree by having your partner start at the root of the tree and walk, counting their steps, until they have reached the length of the stick in your vision.
5. Measure foot size to get an accurate measurement of the base of the tree to the stick.


## 7. Take your foot size in inches and multiply it by the number of steps to the stick.

8. Now you have the height of the tree.
9. Some fun facts: According to the group that did this project the largest tree on campus is 124 ft and is between Sequoia and Placer Halls. According to Facilities the largest trees on campus are between Sacramento and Lassen Halls and range from 110-117 ft. tall. They are also the oldest trees on campus, planted in the 1940's. What is the largest tree on your campus?

More applications could be using different shoe sizes, finding the height to multiple trees, or using other methods.

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[^0]:    ${ }^{\text {i }}$ Shirley, James Clifford. (1937). The Redwoods of Coast and Sierra. 11

