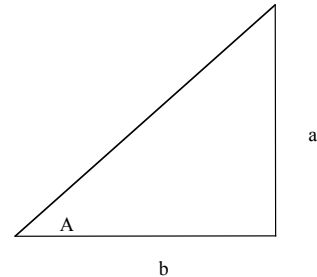


**Study Questions—Week 1**  
Forests Through Time and Space: Sept 29, 2004

These questions are due on Monday, October 4<sup>th</sup>. You may discuss these questions with other people if you want. We will discuss these questions at the beginning of class on Monday—be sure that you have your written answers with you then.

1. The height of a tree can be determined (without climbing the tree) using a measuring tape and a clinometer which allows you to measure the vertical angle above the horizontal plane. Dust off those rusty trigonometry skills. Remember that the tangent of a particular angle is the length of the opposite side (a) divided by the length of the adjacent one (b).



Thus the tangent of the angle at pt A in the diagram is

$$\tan A = \frac{a}{b}$$

When measuring the height of a tree, you will measure the distance you are standing from the tree (side b) and the angle A and calculate the height using a rearrangement of the tangent formula. The height of the tree (a) = tangent of angle A times the distance from the tree (b). In practice, you also need to add the height from the ground to your eye since you are not measuring the angle A from the surface of the ground (assuming the viewer and tree are on a flat surface). The determination of tree height when you are on a slope adds a second calculation which we will ignore for now.

Tree height =  $\tan A \times b$  + eye height

What is the height of the tree if (assume an eye height of 62 inches):

- a. The distance b is 100 ft and the angle (A) is 65 degrees?
- b. The distance b is 75 ft and the angle (A) is 45 degrees?
- c. The distance b is 50 ft and the angle (A) is 73 degrees?

2. In your own words, address the following question: Does our inability to fix upon a single, always applicable species concept put the concept of species at risk?

3. Both Individual species and entire ecosystems are frequent subjects of restoration efforts. Describe the advantages and disadvantages of both.

4. Do you think the restoration project at Mima Mounds will be successful? What aspects do you think will work? What aspects do you think won't work? Why?

## *Quiz Questions—week 1*

### Forests Through Time and Space: Sept 29, 2004

These questions are due in class on October 4. Do not discuss your answers with anyone once you have begun working on them.

1. What are the characteristics of a stand of trees that make it a forest? Be as specific as you can.
2. Some tropical plant species produce flowers that are foul-smelling and brown in color.
  - Propose three alternative hypotheses that could explain this observation.
  - For each of your three hypotheses, generate at least two predictions that follow from that hypothesis. (Remember that one of the primary purposes of prediction in science is that, when a prediction turns out to be *untrue*, you have effectively *falsified* your hypothesis (and this is the goal). Therefore you are trying to generate predictions that necessarily follow from the hypothesis.)
  - Design a test that will enable you to discriminate between at least two of the hypotheses that you have generated. (Your test may be based on field work, laboratory work, or literature review, with natural or perturbed systems—anything that seems appropriate to distinguish between your alternative hypotheses.)