CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)	Project Number
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Project Title
Parallax

Abstract

Objectives/Goals

I wanted to demonstrate how parallax works in measuring distances on a small scale, and to see if one method was more accurate than the other. My hypothesis was that the tangent method would be more accurate than the radian method.

Methods/Materials

I used a large room with a blackboard at one end. About 20 feet from the wall, I placed a "target," a yardstick taped to a chair so that the top of the yardstick was about five feet off the ground. I then marked on the board, the two points at which the target was viewed from two points equidistant from a midpoint on the baseline. In some cases the two viewpoints were two eyes on a person's face.

I then used a protractor, placed on the target, and a string to measure the degrees those two points on the wall were apart. Using that measure, I then used two methods to measure the distance from the the baseline to the target.

The tangent method is using the right triangle formed by one viewpoint, part of the baseline, and the distance to the target. Knowing the angle of the viewpoints on the board, allows you to find out all three angles in the triangle. You also know the measure on the baseline from the midpoint to one viewpoint. You can then look up the tangent and find out the distance to the object.

To use the radian method, you have to imagine a circle that the target is the center of. The angle of the two points on the board gives you the measure of the arc between the two viewpoints on the baseline. Putting the length of the distance between the viewpoints (the radian) over the arc it cut off in the circle, you can find out the circumference of the circle. You then divide by 2pi to determine the radius, which is the distance to the object.

Results

I found out that using parallax on this small scale was an accurate way to measure distances. However, there was no significant difference in the accuracy of the two methods

Conclusions/Discussion

Parallax works but it requires very accurate measurements of the angles involved. On this small scale, there was not a significant difference between the two methods. On a large scale, my hypothesis might be correct because the difference between the radian and the length of the arc would increase.

Summary Statement

I wanted to demonstrate how parallax works and show which method was more accurate.

Help Received

My dad helped me to measure the angles using the string.