PARALLAX AND THE DISTANCE TO STARS

PURPOSE: To apply the method of parallax to estimate the distance to distant objects.

PROCEDDURES:

1. Fit the two sides of the rangefinder together at their centre lines. Place it on the desk in front of you with the baseline along the front edge of the desk.
2. Place your nose at the "vertex pin centre" and sight along the "aim sight" centre line.
3. Hold a pencil upright at the 2.0 cm position along the aim sight line. The pencil represents a nearby star and you are the earth-bound observer.
4. Look at the pencil with one eye open and note its angular position on the rangefinder. Now, without moving the position of your head, close that eye open the other one and note the new apparent position of the pencil on the rangefinder. Record the difference between these two values on the table below. This value is known as the "parallax" and is measured in degrees of angle.
5. Repeat this procedure for pencil positions at even intervals up to 20 cm.

DATA TABLE:

OBJECT DISTANCE (cm)	PARALLAX (degrees)

6. Prepare a graph of these results. ("Distance from observer (cm)" on horizontal axis, "Parallax (degrees)" on vertical axis)

QUESTIONS:

1. How does the amount of parallax change as the distance to the object increases?
2. Using your graph, estimate the distance to an object if its parallax is 30 degrees.
3. What effect will increasing the baseline distance (the distance between the two viewing positions) have on the amount of observed parallax?
4. Is it an advantage to have a long or a short baseline distance when using the parallax method to estimate the distance to very faraway objects? Explain.
5. What is the maximum, practical baseline distance that can be used for measuring the parallax of stars?

CONCLUSION: Summarize in your own words how the distance to stars can be estimated.