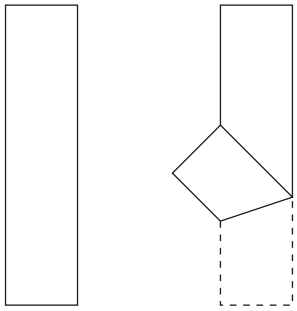
Folding Paper[1]



The Problem:

You have a sheet of paper that is 6 units wide and 25 units long placed so that the short side is facing you. Fold the lower right hand corner over to touch the left side. Your task is to fold the paper in such a way that the length of the crease is minimized.

- What is the length of the crease?
- What angle does the minimal crease form with the rightmost edge?

Things to Consider:

This problem involves calculus (you have something to minimize) but the hard part turns out to be finding a formula for the length of the crease (a function to minimize). I did it without resorting directly to trigonometry - though you may prefer to try it that way. Right triangles in some form will be necessary. Experiment with a piece of paper until you convince yourself that you understand the problem. Only then should you begin generating diagrams. There will be several cases to consider.

Completed Project:

When you have done the work necessary to complete the project, you need to prepare it in written form. The paper you submit should have a mix of equations, formulas, diagrams, and prose to support your conclusions. Use complete sentences, good grammar, and correct punctuation. The prose should be written in order to convey to the reader an explanation of what you have done. It should be written in such a way that it can be read and understood by anyone familiar with the material in this course. You will be graded on your written presentation as well as the mathematical content. Be sure to include all of your reasoning and cite any resources you used in finding your solution.

[1] Adapted from Apostol *Calculus*; Blaisdell Publishing, Inc.: New York, NY, 1961