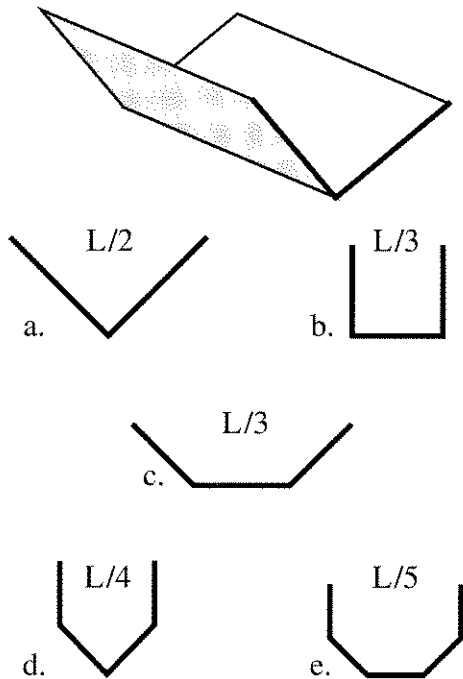


14.A In the Gutter

You have a long rectangular sheet of metal, having width L inches. You intend to fold it to make a gutter. You want to find out which of the folds shown in the figure will give the maximum flow of water. This depends on the area of the cross-section of the gutter; a bigger area means better flow.



1. Find the area of the cross-section for the examples shown in the figure. (All angles are 90 or 135 degrees. All sides in each cross-section are of equal length. Hint: Divide the areas into rectangles and right triangles that are half-squares.) Which cross-section has the greatest area?
2. You may try the same shapes with different dimensions. For example, for cross-section b, you could have a height of $L/4$, and a width of $L/2$. Try to increase the areas for cross-sections b, c, d, and e by choosing different values for the different segments. (Remember that the sum of all the lengths must be L .)
3. **Report** Figure out the best design for a gutter. Write an illustrated report on your research, explaining clearly how you arrived at your conclusions. You need not limit yourself to the shapes given here.