

Imagine that you are drawing a cube in three-point perspective on a piece of paper, but you wish all three vanishing points to be on the paper. Your job is to maximize the viewing distance, subject to the three vanishing points being on the paper. Do this for all three cases of paper shapes and sizes. (Hint: A formula for the viewing distance was given in class and is on page 50 in Zeeman's notes. The vanishing points for the maximum viewing distance must be on the boundary of the paper.) I will give credit for the largest viewing distance found for the class (and me) for each case. You do not have to prove that your answer is the maximum, but if you do provide a proof, I will give even more credit. The following are the shapes.

Problem 1. A circle of radius 1 unit length.

Problem 2. A square, one unit length on a side.

Problem 3. An 8.5" by 1" rectangle.

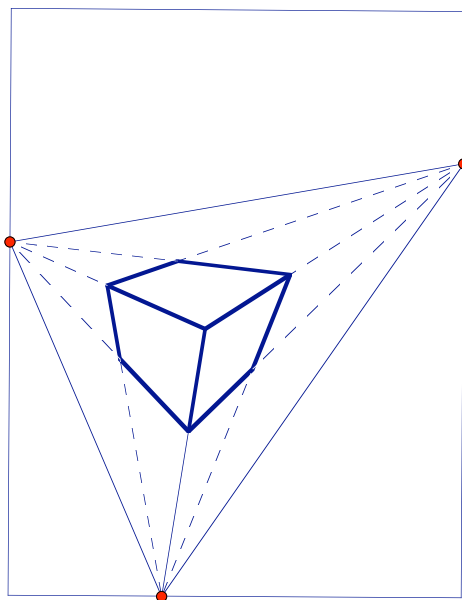


Figure 1: This is what the three-point perspective figure looks like with the vanishing points on the paper.