



Draw four dots that mark the corners of a perfect square as shown in the illustration.

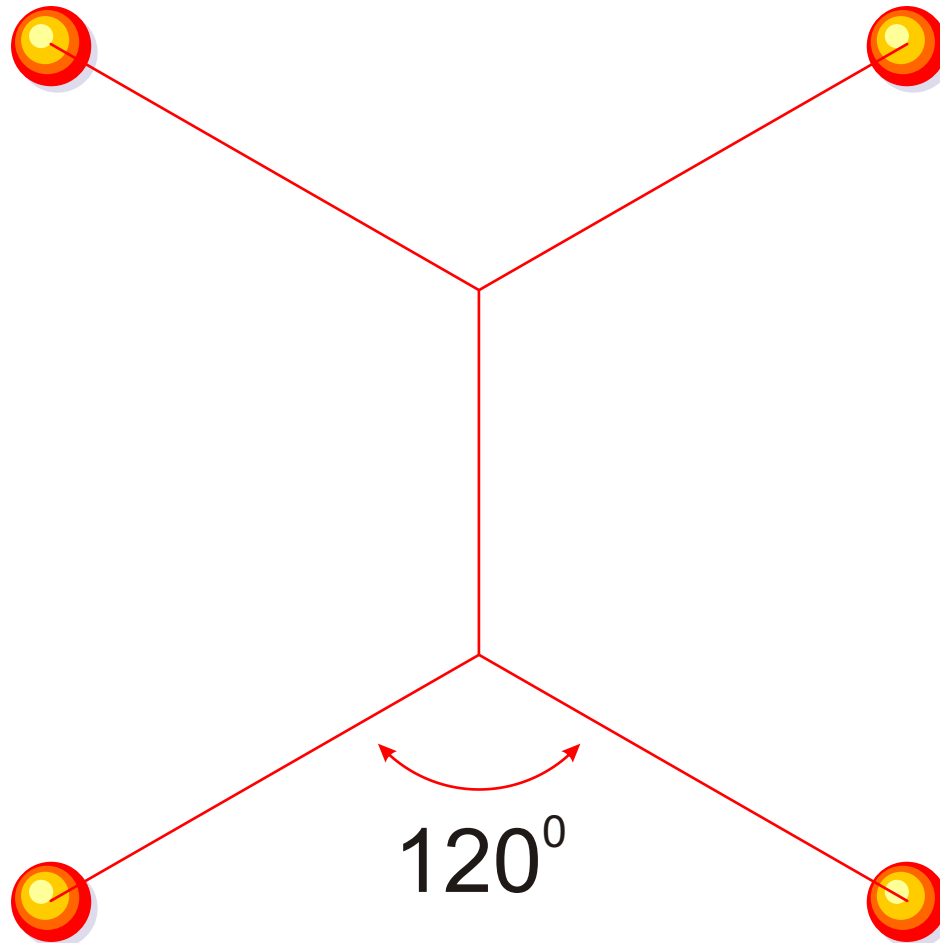
The object is to draw a minimal network spanning them. The parts of it may intersect, and you're allowed to use additional dots while drawing the network.

# Shortest Connection

Solution

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At first sight it seems that the cross of the two diagonals with one additional point makes the minimal network. But, in fact, it isn't. If the side of the square is 1 then the total length of the cross is  $2\sqrt{2}$ , or about 2.828. With the same side of the square total length of the network (with two points of intersections) shown in the illustration on the left is only  $(1 + \sqrt{3})$ , or about 2.732, that makes it the minimal possible network to span the four corners of a square.

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