Book 11 Proposition 22

If there are three plane angles, of which (the sum of any) two is greater than the remaining (one), (the angles) being taken up in any (possible way), and if equal straight-lines contain them, then it is possible to construct a triangle from (the straight-lines created by) joining the (ends of the) equal straight-lines.

Let \overrightarrow{ABC} , \overrightarrow{DEF} , and \overrightarrow{GHK} be three plane angles, of which the sum of any