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PROBLEM OF THE MONTH

Term: November 2019

In a country between any two cities there is a direct round flight operated by only one of $r \geq 3$ air companies. Suppose that *only* by using of flights of *any* of these r companies it is possible to visit any city from any other city (directly or by using of several flights). Prove that there are three cities such that direct flights between them are operated by three different companies.