RESEARCH PROBLEM

\[ \text{bases and perfect symmetric structures is one-one. Note that } A < B \text{ means that } B \text{ contains the neighborhood of } A \text{ of order } U <. \]

The passage from uniformity to proximity to topology goes this way. If \( S \) is perfect and symmetric, then \( \{ < \} = \{ \cup S \} \) is (simple and) symmetric; and if \( A < 'B \) means that \( \{ x \} < B \) for all \( x \in A \), then \( \{ < ' \} \) is (simple and) perfect.

The familiar discrete structures are obtained from the family \( \{ \subset \} \). The usual uniformity on \( R \) is obtained from \( \{ < ' : \varepsilon > 0 \} \) [reviewer's notation], where \( A < ' B \) means dist \( (A, R - B) \geq \varepsilon \). (The associated relations \( U^* \) of (f) then satisfy: \( x U^* y \) if and only if \( |x - y| < \varepsilon \).)

Leonard Gillman

RESEARCH PROBLEM


Prove or disprove the following conjecture suggested by J. Selfridge (oral communication). For any graph \( G \) with 9 points, \( G \) or its complementary graph \( \overline{G} \) is nonplanar. Experimental evidence appears to support this conjecture, which in turn would imply the validity of the conclusion for any graph with at least 9 points. A simple argument using Euler’s polyhedron formula serves to prove that if \( G \) is a graph with \( p \) points and \( q \) lines for which \( q > 3p - 6 \), then \( G \) is nonplanar. This proves the conclusion of the conjecture for all graphs with at least 11 points. For graphs \( G \) with 9 or 10 points, it is still open. (Received August 15, 1961.)