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Plane separation

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THEOREM. *A simple closed curve J in the plane E^2 separates E^2.*

Proof. If $E^2 - J$ is connected compactify E^2 by adding a point and then remove a point from J to get a topological closed line l in E^2 that does not separate E^2.

Consider E^2 as a plane in space E^3. By the van Kampen Theorem $E^3 - l$ is simply connected. However, by (1) there is a homeomorphism of E^3 onto E^3 carrying l onto the Z-axis, l^1. But $E^3 - l^1$ has the homotopy type of a circle. Hence $E^2 - J$ is not connected.

REFERENCE

(1) KLEE, V. L. Some topological properties of convex sets. *Trans. Amer. Math. Soc.* **78** (1955), 30–45.

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