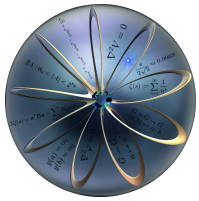

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connected im kleinen

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A topological space X is *connected im kleinen at a point* x if every open set U containing x contains an open set V containing x such that if y is a point of V, then there is a connected subset of U containing $\{x, y\}$.
Another way to say this is that X is connected im kleinen at a point x if x has a neighborhood base of connected sets (not necessarily open).

A locally connected space is connected im kleinen at each point.

A space can be connected im kleinen at a point but not locally connected at the point.

If a topological space is connected im kleinen at each point, then it is locally connected.

References

[1] S. Willard, *General Topology*, Addison-Wesley, Publishing Company, 1970.

[2] J.G. Hocking, G.S. Young, *Topology*, Dover Pubs, 1988, republication of 1961 Addison-Wesley edition.