

Graph-Theoretic Property: *atis* PathConnectedElements

(*Graph-theoretic properties* are those properties that are part of the meta-theory and have been abducted from graph theory to be used as a tool to provide solutions concerning the theory. Those solutions may be assigned as values to components or relations of the theory and thereby become part of the theory.)

Path-connected elements, $_{pc}E$, =_{df} Elements that are connected in the same direction from one to the other; that is, you can “get from one to the other” by following a directed-path in the same direction.

$$_{pc}E, =_{df} \{(\mathbf{x}, \mathbf{y}) \mid (\mathbf{x} = \mathbf{x}_0, \mathbf{x}_1, \mathbf{x}_2, \dots, \mathbf{x}_{n-1}, \mathbf{x}_n = \mathbf{y}) \wedge \forall (\mathbf{x}_i, \mathbf{y}_i)_{i < n} [\mathbf{y}_i = \mathbf{x}_{i+1}]\}$$

Path-connected elements are defined as a set of ordered pairs such that the elements are a sequence from \mathbf{x}_0 to \mathbf{x}_n , and $\mathbf{y}_i = \mathbf{x}_{i+1}$.

Path-connectedness is intuitively defined as the ability to get from one element to another by following a sequence of elements.