

Name: _____

Please show all work and justify your answers.

1. Prove that discs in a metric space are open.
2. Prove that the topology induced by a metric restricted to a subspace of a metric space is the same as the subspace topology.
3. State and prove a containment relation between the intersection of interiors and the interior of intersection. Show by way of an example that equality does not hold in general. Under what additional hypothesis can you expect equality?
4. Given a subset of a topological space, show that its interior, the interior of its complement and its boundary (frontier) partition the whole space.
5. Given a continuous map between topological spaces and a subset of the domain, state and prove a containment relation between the forward image of the closure of the subset and the closure of the forward image. Provide an example, where the two are not equal.

1	2	3	4	5	total (50)	%

Prelim. course grade: %