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Assignment 12 Quiz 9 Pt 2

**Question 1**

*P(X)*is the power set of *X*, where *X* = {c, d, e, f}. A relation **S**is defined on *P(X)*as follows: For all C, D ∈ *P(X),*C **S**D ⇔ the number of elements in C is not equal to the number of elements in D.

Show whether S is reflexive, symmetric, or transitive.

Show whether S is an equivalence relation.

**S is not reflexive:** If C has 3 elements and D has 2 elements (C does not have the same number of elements as D), C3 will not have an element such that C3 S C3.

**S is not symmetric:** If C has 3 elements and D has 2 elements (C does not have the same number of elements as D), C3 does not have a relation to D3 and D3 does not have a relation to C3 because D3 does not exist.

**S is not transitive:** If C has 3 elements and D has 1 element (C does not have the same number of elements as D), D may not have a relation to any element in C.

Because S is not reflexive, symmetric, **and** transitive, it is not an equivalence relation.