Self-dual and quasi self-dual algebras

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A *self-dual* algebra is an associative or Lie algebra *A* together with an *A* bimodule isomorphism *A ! A*_op, where *A*_ = Hom$_k$(*A; k*), the dual bimodule to *A* (considered as an *A* bimodule), and *A*_op is the the same underlying *k* module as *A*_ but is an *A* bimodule whose left operation by an element *a 2 A* is the same as the right operation by *a* on *A*_, and similarly with left and right interchanged. This induces an isomorphism *H*◦Ë(*A;A*) »= *H*◦Ë(*A;A*_ op); algebras with such an isomorphism are *quasi self-dual*. For these algebras *H*◦Ë(*A;A*) is a contravariant functor of *A*. They form a full subcategory of the category of the category of associative or Lie algebras, respectively. Finite dimensional associative self-dual algebras over a ¯eld are identical with symmetric Frobenius algebras (which are closely connected to 1+1 dimensional topological quantum ¯eld theory). Finite poset algebras are quasi self-dual.