The degree of irrationality of a complex projective n-dimensional variety X is the minimal degree of a dominant rational map from X to n-dimensional projective space. It is a birational invariant that measures how far X is from being rational. Accordingly, one expects the computation of this invariant in general to be a difficult problem. Alzati and Pirola showed in 1993 that the degree of irrationality of any abelian g-fold is at least g+1 using inequalities on holomorphic length. Tokunaga and Yoshihara later proved that this bound in sharp for abelian surfaces and Yoshihara asked for examples of abelian surfaces with degree of irrationality at least 4. Recently, Chen and Chen-Stapleton showed that the degree of irrationality of any abelian surface is at most 4. In this work I provide the first examples of abelian surfaces with degree of irrationality 4. In fact, I show that most abelian surfaces have degree of irrationality 4. For instance, a very general (1,d)-polarized abelian surface has degree of irrationality 4 if d does not divide 6. The proof is very short and uses nothing beyond Mumford's theorem on rational equivalences of zero-cycles on surfaces with $p_g>0$.