Standing solitary waves and twisting waves which result from parametric excitation in a narrow rectangular water tank are discussed. We derive a generalized Schrödinger equation, extending the Lagrangian method of Miles [J. Fluid Mech. 148 (1984) 451]. The effects of damping and forcing terms third-order in the wave amplitude, and also the fifth-order conservative frequency shift are investigated. In particular, it is found that constant-phase stationary solitary waves no longer exist when cubic damping and cubic forcing are non-zero: in this case a non-constant phase stationary solution is found which results in a modification of the shape of the standing solitary wave. We also find that non-zero cubic damping can, in some circumstances, give rise to a time-modulated solitary wave and/or coexistent solitary wave solutions. It is also demonstrated that these nonlinear terms greatly effect mode competition between twisting waves, and can cause the twisting waves to evolve chaotically.

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