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Getting Something For Nothing

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The Reciprocal Theorem of low-Reynolds-number hydrodynamics is a useful tool for (i) understanding some of the theoretical structures that underlie the subject and (ii) for using perturbation expansions to solve various flow problems when only an integrated quantity such as a force or a pressure drop are required. The latter applications often give the impression that you are getting something for nothing. We will highlight several uses of these ideas by Howard Brenner and then give examples of recent applications of the Reciprocal Theorem, including two examples where Marangoni stresses are important.