



## Real Integral Limit Theorems

### 1 Why

A vista sheet on exchanging integrals and limits.

### 2 Discussion

The monotone convergence theorem and the dominated convergence theorem give conditions under which we can exchange a limit with an integral. Since an integral is a limit, these theorems give conditions under which we can exchange limits.

We remember in exchanging these limits that we are really exchanging infinite processes. It is no surprise that this exchange does not always make sense. Nonetheless, the dominated convergence theorem gives a simple criteria which is easy and guarantees the desired exchange is valid.

TODO: Structure of the theory. Building from the monotone convergence for simple functions through to the dominated convergence.