Convergence of AdaBoost

- can use to prove AdaBoost converges to common solution of both problems:
  - can argue that $\mathbf{d}^* = \lim \mathbf{d}_t$ is in $\mathcal{P}$
  - vectors $\mathbf{d}_t$ are in $\mathcal{Q}$ always $\Rightarrow \mathbf{d}^* \in \overline{\mathcal{Q}}$

  $\therefore \mathbf{d}^* \in \mathcal{P} \cap \overline{\mathcal{Q}}$

  $\therefore \mathbf{d}^*$ solves both optimization problems
- so:
  - AdaBoost minimizes exponential loss
  - exactly characterizes limit of unnormalized "distributions"
  - likewise for normalized distributions when weak learning assumption does not hold
- also, provides additional link to logistic regression
  - only need slight change in optimization problem

[with Collins & Singer; Lebannon & Lafferty]