

Theorem 8.17 (The Rate-Distortion Theorem) $R(D) = R_I(D)$.

Theorem 8.18 The following properties hold for the information rate-distortion function $R_I(D)$:

1. $R_I(D)$ is non-increasing in D .
2. $R_I(D)$ is convex.
3. $R_I(D) = 0$ for $D \geq D_{max}$.
4. $R_I(0) \leq H(X)$.

Theorem 8.15 The following properties hold for the rate-distortion function $R(D)$:

1. $R(D)$ is non-increasing in D .
2. $R(D)$ is convex.
3. $R(D) = 0$ for $D \geq D_{max}$.
4. $R(0) \leq H(X)$.