INFORMATION THEORY

HOMEWORK # 2:


Show work and explain reasoning. Two (2) problems, selected at random amongst these six problems, will be marked.

1. Solve Problem 2-7 (CT).

2. Solve Problem 2-9 (CT). Perhaps to confuse matters, recall that with E an arbitrary set, a mapping $d : E \times E \rightarrow \mathbb{R}_+$ is a distance on $E$ if the following conditions are satisfied:

   (i) Symmetry: $d(y, x) = d(x, y)$ for all $x, y$ in $E$;

   (ii) Positive definiteness: $d(x, y) = 0$ if and only if $x = y$

   (iii) Triangular inequality: $d(x, y) \leq d(x, z) + d(z, y)$ for all $x, y, z$ in $E$.

   Therefore, what is the natural space on which the function $\rho$ defined in the problem is a metric? Beware!

3. Solve Problem 2-28 (CT).

4. Solve Problem 2-30 (CT).

5. Solve Problem 2-39 (CT).