Assignment1

(b) $[0]_{\equiv}=\{0,1\}$

$[1]_{\equiv}=[0]_R$, $[2]_{\equiv}=\{2\}$,因为 $A/_{\equiv}=[0]_{\equiv}\cup[1]_{\equiv}\cup[2]_{\equiv}$, 所以$A/_{\equiv}=\{\{0,1\},$ $\{2\}\}$.

Please use the knowledge about **set theory** to solve the following problems.

1. [1 pts] $|\{\emptyset\}|$ = 1 .
2. [2 pts] Which of the following statement is **NOT** true? (Multiple choice, there may be more than one correct answer) AD

   A. If $\mathbb{N}$ is the set of Natural Numbers, then the size of $\mathbb{N}$ is ∞.

   B. A power set is a set of sets.

   C. For a finite set, the size of its power set is greater than its size.

   D. If S – P = Ø, then S = P (Both S and P are sets).

   E. The elements of a set can be the set
3. [2 pts] Let A = {0, 2, 4}, B = {1, 3, 5}, C = {3, 4, 5}. Find

   a) $A \cup (B - C)$ {0, 1, 2, 4}

   b) $A \times (B - C)$ {(0,1), (2,1), (4,1)}

   c) $|\{P(A) - P(C)\}|$ 6

   d) $P(A) \cap P(B - C)$ {Ø}

Less Than Relation RLT5

N 5 = {0,1,2,3,4}

RLT5 : N 5 → N 5 = df { (0,1),(0,2),(0,3),(0,4), (1,2), (1,3),(1,4), (2,3),(2,4), (3,4)}

4. [2 pts] We use R_{LT5} to note the **"Less Than" Relation** on natural numbers smaller than **5.**

   (1) Please define R_{LT5} as the set of ordered pairs mathematically.

   Example: Addition Relation on natural numbers smaller than 2 is

   $$AddR_2: N_2 \rightarrow N_2 =_{df} \{(0,0), (0,1), (1,0), (1,1)\}$$

   (2) R_{LT5} is dfgh.

   a. Universal b. Identity c. Reflexive d. Irreflexive

   e. Symmetric f. Antisymmetric g. Connected h. Transitive
5. [2pt] Let $P=\{0,1,2\}$. $R=\{(0,0),(0,1),(1,0),(1,1),(2,2)\}$ is a relation on P.

   (a) (True or False) R is an equivalence relation. true

   (b) If (a) is true, find the equivalence class $[0]_{\equiv}$ and the quotient set of P defined by R. If (a) is not true, find a counterexample. see above before q1