85.

~15 ⑨ : {1, 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024}
: {0-9, a-f}
: {1, 8, 27, 64, 125}

④ True

⑤ False

⑥ False

⑦ True

① Differentiate between

. Set, Subset, Proper Subset, Power Set.

→ Let A be a set $A = \{1, 2, 3\}$

→ Subset $\{1\} \subseteq A$; $\{2\} \subseteq A$; $\{3\} \subseteq A$.

→ Proper Set $B = \{1, 2, 3\} \in A$. So B is a proper set of A

$B \subseteq R$

→ Power Set contains all subset of set

$P(A) = \{\emptyset, \{1\}, \{2\}, \{3\}, \{1,2\}, \{1,3\}, \{2,3\}, \{1,2,3\}$

• Domain is the set of all possible input to a function $f(n)$. Whereas Range is the output of function $f(n)$

• Empty set = $\{\emptyset\}$ and Empty Strings = $\{\}$ or ε

• Function is an object that set up on input and output relationship whereas Relation is a predicate, most typically when the domain is a set of k-tuples.

3. The formal definition

* DFA

A finite automaton is a 5-tuple $(Q, \Sigma, \delta, q_0, F)$

where ① Q is a finite set called the states

② Σ is a finite set called the alphabet

③ $\delta: Q \times \Sigma \to Q$ is the transition function

④ $q_0 \in Q$ is the start state

⑤ $F \subseteq Q$ is the set of accept state.

* NFA

A nondeterministic finite automaton is a 5-tuple $(Q, \Sigma, \delta, q_0, F)$

where ① Q is a finite set of states

② Σ is a finite alphabet.

③ $\delta: Q \times \Sigma_\varepsilon \to \mathcal{P}(Q)$ is the transition function

④ $q_0 \in Q$ is the start state

⑤ $F \subseteq Q$ is the set of accept states.

* Regular Language is a language that is recognized by finite automaton.

* Regular expression is a special string for describing a search pattern.

(3)
- Union $A \cup B$
- Concatenation $A \circ B$
- Star A^*

Where A & B be languages.