

Of those who took the quiz, the overwhelming majority answered all ten questions correctly. The following table gives the number of respondents who obtained each score. There were no scores below 5. A large number (18) did not take the quiz, but some of those might have dropped.

<i>score</i>	10	9	8	7	6	5
<i>number</i>	26	7	7	1	2	1

The numbers in parentheses below show the number of people who missed each question.

1. If Σ contains at least one element, then Σ^* is infinite. **true (2)**
2. There are strings in Σ^* of infinite length. **false (8)**
3. Set intersection is associative. **true (1)**
4. $A \cup \emptyset = \emptyset$. **false (2)**
5. $A\emptyset = \emptyset$. **true (7)**
6. The complement of $\{a\}^*$ in $\{a, b\}^*$ is $\{b\}^*$. **false (4)**
7. There is exactly one string in Σ^* of length 0. **true (3)**
8. $\emptyset = \varepsilon$. **false (1)**
9. $\emptyset = \{\varepsilon\}$. **false (8)**
10. $\{ab, a\}\{ba, a\} = \{abba, aba, aa\}$. **true (1)**

The questions that tripped people up the most were 2, 5, 6, and 9.

2. The set Σ^* is the set of all finite-length strings over the alphabet Σ (K, Def. 2.1, p. 8). For example,

$$\{a, b\}^* = \{\varepsilon, a, b, aa, ab, ba, bb, aaa, aab, aba, baa, abb, bab, bba, bbb, aaaa, aaab, \dots\}.$$

This set contains infinitely many strings and there is no finite bound on their length; nevertheless, every element is of finite length. The length of a string $x \in \Sigma^*$ is the number of letters in it and is denoted $|x|$. For example, $|aaab| = 4$.

5. Formally, AB is defined to be the set of all strings xy obtained by concatenating a string x from A with a string y from B . If $B = \emptyset$, then there are no strings $y \in B$, so there are no possible such concatenations xy . Thus $A\emptyset = \emptyset$.
6. The set $\{a, b\}^*$ is the set of all strings of a 's and b 's. The set $\{a\}^*$ is the set of all strings consisting only of a 's. A string does not consist only of a 's iff it contains at least one b . The complement of $\{a\}^*$ in $\{a, b\}^*$ is therefore the set of strings of a 's and b 's containing at least one b .
9. The set \emptyset is the empty set. It containing no elements. The set $\{\varepsilon\}$ contains one element, namely ε , the empty string.