

10.11-5 16.10

TV SADA

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

c) $P(\{\{*\}, \{1,2\}, \Delta\}) = \{\emptyset, \{\{*\}\}, \{\{1,2\}\}, \{\Delta\}, \{\{*\}, \{1,2\}\}, \{\{*\}, \Delta\}, \{\{1,2\}, \Delta\}, \{\{*\}, \{1,2\}, \Delta\}\}$

2) $|P(M)| = 4, \{\{5\}\} \subseteq P(M), \{\emptyset\} \in P(M)$

$$P(M) = \{\emptyset, \{\emptyset\}, \{5\}, \{\emptyset, 5\}\}$$

$$M = \{\emptyset, 5\}$$

3) $|P(\emptyset)| = 1, |P(P(\emptyset))| = 2, |P(P(P(\emptyset)))| = 4$
 $P(\emptyset) = \{\emptyset\}, P(P(\emptyset)) = \{\emptyset, \{\emptyset\}\}, P(P(P(\emptyset))) = \{\emptyset, \{\emptyset, \{\emptyset\}\}, \{\{\emptyset\}\}\}$

4) $P(A \setminus B) \stackrel{?}{=} P(A) \setminus P(B)$ — NEPLATI

$$(\forall X: X \in P(A \setminus B) \Rightarrow X \subseteq (A \setminus B) = X \subseteq A \wedge X \not\subseteq B)$$

$$A = \{1, 2\}$$

$$B = \{2\}$$

$$A \setminus B = \{1\}$$

$$P(A \setminus B) = \{\emptyset, \{1\}\} \quad P(A) = \{\emptyset, \{1\}, \{2\}, \{1, 2\}\} \quad P(B) = \{\emptyset, \{2\}\}$$

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

5)

a) 2, 6, 18

$$|A_2 \cup A_6 \cup A_{18}| = |A_2| + |A_6| + |A_{18}| - |A_2 \cap A_6| - |A_2 \cap A_{18}| - |A_6 \cap A_{18}| + |A_2 \cap A_6 \cap A_{18}| = |A_2|$$

$$1000 - |A_2| = 500$$

b) 4, 6, 32

$$|A_4 \cup A_6| = |A_4| + |A_6| - |A_4 \cap A_6| \quad |A_4| = 250 \quad |A_6| = 166 \quad |A_4 \cap A_6| = |A_{12}| = 83$$

$$|A_4 \cup A_6| = 250 + 166 - 83 = 333$$

$$1000 - 333 = 667$$

7)

$$2^3 = 8 \quad 3^3 = 27 \quad 4^3 = 64$$

$$|A_8 \cup A_{27}| = |A_8| + |A_{27}| - |A_8 \cap A_{27}|$$

$$|A_8| = 12 \quad |A_{27}| = 3 \quad |A_8 \cap A_{27}| = 0 \Rightarrow |A_8 \cup A_{27}| = 15$$

$$99 - 15 = 84$$

6)

$$2^2 = 4 \quad 3^2 = 9 \quad 4^2 = 16 \quad 5^2 = 25 \quad 6^2 = 36 \quad 7^2 = 49 \quad 8^2 = 64 \quad 9^2 = 81$$

$$|A_i| = |A_4| + |A_9| + |A_{25}| + |A_{49}| - |A_{36}|$$

$$|A_4| = 24 \quad |A_9| = 11 \quad |A_{25}| = 3 \quad |A_{49}| = 2 \quad |A_{36}| = 2 \quad |A_i| = 38$$

$$99 - 38 = 61$$

8

$|A|$... počet poradí s DEN

$|B|$... počet poradí s NOC

$|A \cap B|$... s DEN, NOC

$$|A \cup B| = |A| + |B| - |A \cap B|$$

VÝSLEDOK: počet poradí celkovo $= |A \cup B|$

$$|A| = \frac{16!}{3!} = \binom{16}{3} \cdot 13! = \frac{16!}{3! \cdot 13!} \cdot 13!$$

$$|B| = \frac{16!}{3!}$$

$$|A \cap B| = \frac{16!}{5!}$$

$$|A \cup B| = \frac{16!}{3!} + \frac{16!}{3!} - \frac{16!}{5!}$$

$$16! - \frac{16!}{3!} - \frac{16!}{5!}$$

9

$$|A| = \frac{16!}{3!} \quad |B| = \frac{16!}{4!} \quad |A \cap B| = 0$$

$$16! - \frac{16!}{3!} - \frac{16!}{4!}$$