

1 a. $A = \{a, b, c, d, e\}$ $|A| = 5$

b. $A^3 = \{(a, a, a), \dots, (e, e, e)\}$

c. $5P_3 = \frac{5!}{(5-3)!} = \frac{5!}{2!} = 60$

2. 2^{500}

3. $|A| = 3$ $|B| = 4$

a. largest $|A \cup B| = 7$ b. smallest $|A \cup B| = 4$ c. largest $|A \cap B| = 3$ d. smallest $|A \cap B| = \emptyset$

4. 4 animals, 1 animal @ a time \Rightarrow # of diff. ordering are there

$4! = 4 \cdot 3 \cdot 2 \cdot 1 = 24$ diff. orderings

5. sequences of 5 characters English

26^5

6. $\binom{10}{3} = \frac{10 \cdot 9 \cdot 8}{3 \cdot 2 \cdot 1} = \frac{720}{6} = 120$

7. $\binom{10}{5} = \frac{10 \cdot 9 \cdot 8 \cdot 7 \cdot 6}{5 \cdot 4 \cdot 3 \cdot 2 \cdot 1} = \frac{30240}{120} = 252$