

Seminar 13 (Suggested Solution)

1. Possibilities = $3 \times 5 \times 4 \times 2 = 120$
2.
 - a. $0! = 1$
 - b. $5! = 5 \times 4 \times 3 \times 2 \times 1 = 120$
 - c. ${}_{10}P_3 = 10! / (10-3)! = 10! / 7! = 720$
 ${}_{10}P_7 = 10! / (10-7)! = 10! / 3! = 604,800$
 - d. ${}_{10}C_3 = 10! / 3! (10-3)! = 10! / 3!7! = 120$
 ${}_{10}C_7 = 10! / 7! (10-7)! = 10! / 7!3! = 120$
 - e. ${}_{1000}C_5 = 1000! / 5! (1000-5)! = 1000! / 5!995!$
 $= 1000 \times 999 \times 998 \times 997 \times 996 / 5!$
 $= 8.25029125 \times 10^{12}$
3. possibilities = $6! = 720$
4. possibilities = ${}_9P_3 = 9! / (9-3)! = 9! / 6! = 504$
5. since a person does not care about the order in which the cards are dealt,
possibilities = ${}_{52}C_{13}$
 $= 6.350135596 \times 10^{11}$
6.
 - a. possibilities = ${}_8P_5 = 6720$
 - b. possibilities = ${}_8C_5 = 56$
7.
 - a. possibilities = ${}_{12}P_2 = 132$
 - b. possibilities = ${}_{12}C_2 = 66$
8. possibilities = ${}_{24}C_3 = 2024$
9. possibilities = $4^{10} = 1,048,576$