THEORETICAL PROBABILITY

4.2 p.214 – p.220

Theoretical Probability → the ratio of the number of outcomes that make up an event to the total number of possible outcomes.

$P(A)=\frac{n(A)}{n(S)}$	A: set of outcomes deemed successful. S: set of all possible outcomes (sample space). $n(A)$ or $n(S)$: the number of elements in each set.

- $P(\overline{A})$: Probability of event A not occurring.
- $P(\overline{A})=1-P(A)$: Probability of a compliment event.
- If A is a set of outcomes in S, then $\overline{A}$ is the set of outcomes in S, that are not in A.
- Notations for complement to set A: $A^c, \overline{A}, A'$
- Note: $n(A)+n(\overline{A})=n(S)$

Ex1. A bag contains 5 blue, 3 red, and 2 yellow blocks. One block is randomly selected. Find:

a) $P(blue)=$ b) $P(red)=$ c) $P(\overline{red})=$

Ex 2. In a deck of cards, one is randomly selected. Find:

a) $P(facecard)=$ b) $P(\overline{facecard})=$

Ex 3. Two coins are tossed. Find the probability of:

a) both heads b) one head and one tail

Ex 4. Four coins are tossed. Find the probability of: (use a Tree Diagram)

a) 3 heads and 1 tail

b) 4 tails

c) 2 heads and 2 tails

Ex 5. Two dice are tossed. Find the probability of each element.

a) A: sum is 11
b) B: dice outcome differ by 3
c) C: exactly one die is a 5
d) D: neither die is a 5
e) E: $P(\overline{A})$

Sum		Die 1					
		1	2	3	4	5	6
Die 2	1						
	2						
	3						
	4						
	5						
	6						